

# ÎLES DE CONTRECOEUR NATIONAL WILDLIFE AREA

MANAGEMENT PLAN 2022



Environment and  
Climate Change Canada

Environnement et  
Changement climatique Canada

Canada

CW66-584/2022E-PDF  
978-0-660-41637-3  
EC21260

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Environment and Climate Change Canada  
Public Inquiries Centre  
12<sup>th</sup> Floor, Fontaine Building  
200 Sacré-Coeur Boulevard  
Gatineau QC K1A 0H3  
Telephone: 819-938-3860  
Toll Free: 1-800-668-6767 (in Canada only)  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

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**Acknowledgements:**

This management plan was prepared by Benoît Roberge of the Canadian Wildlife Service of Environment and Climate Change Canada. Thanks are extended to the Canadian Wildlife Service employees who were involved in preparing or reviewing this document: Marielou Verge, Luc Bélanger, Renée Langevin, David Boivin, Édith Leclerc, Luc Robillard, Josée Tardif, Martine Benoit and Stéphanie Gagnon. Special thanks are extended to Marie Fortier and Christiane Foley for their contribution to this work. The Canadian Wildlife Service also wishes to thank Michel Durand Nolett of the Conseil des Abénakis d'Odanak, Karine Richard of the Conseil des Abénakis de Wôlinak and Suzie O'Bomsawin and Hugo Mailhot Couture of the Grand Conseil de la Nation Waban-Aki as well as Guy Vandandaique, Ghislaine Mercier, Catherine Baltazar and Sophie Lemire of the Comité ZIP des Seigneuries, who agreed to review this document.

Environment and Climate Change Canada – Protected Areas website: <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas.html>

How to cite this document:

Environment and Climate Change Canada. 2018. Îles de Contrecoeur National Wildlife Area Management Plan. Environment and Climate Change Canada, Canadian Wildlife Service, Quebec, 54 p.

**Note:** This management plan for this NWA was created, approved and applied to the NWA starting in 2018.

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Copies of this management plan are available at the following addresses:

Environment and Climate Change Canada  
Public Inquiries Centre  
Fontaine Building 12th floor  
200 Sacré-Coeur Blvd  
Gatineau QC K1A 0H3  
Telephone: 819-938-3860  
Toll-free: 1-800-668-6767  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

Environment and Climate Change Canada  
Canadian Wildlife Service  
801-1550 D'Estimauville Avenue  
Québec QC G1J 0C3

Environment and Climate Change Canada – Protected Areas website: <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas.html>

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

## **What are Environment and Climate Change Canada's 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 environment.

## **How has the federal government's investment from Budget 2018 helped manage and expand Environment and Climate Change Canada's National Wildlife Areas and Migratory Bird Sanctuaries?**

The Nature Legacy represents a historic investment over five years of \$1.3 billion dollars to help Environment and Climate Change Canada expand its national wildlife areas and migratory bird sanctuaries, pursue its biodiversity conservation objectives and increase its capacity to manage its protected areas.

According to the Budget 2018, Environment and Climate Change Canada will be conserving more areas, and have more resources to effectively manage and monitor the habitats and species found inside its protected areas

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

The current Protected Areas Network consists of 55 National Wildlife Areas and 92 Migratory Bird Sanctuaries, comprising more than 14 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 on the monitoring of wildlife and enhancement to its habitat, the enforcement of regulations, the maintenance of facilities, and permitting. Management is undertaken in order to maintain the ecological integrity of the protected area and to maintain the attributes for which the

protected area was established. Environment and Climate Change Canada prepares a management plan for each protected area in consultation with Indigenous Peoples, the public 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 be consistent with any law respecting wildlife in the province in which the protected area is situated.

### **What is Protected Area Management?**

Management includes monitoring wildlife, maintaining and improving wildlife habitat, periodic inspections, enforcement of regulations, as well as the maintenance of facilities and infrastructure. Research is also an important activity in protected areas; hence, Environment 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. The management plans should 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 <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas.html> or contact the Canadian Wildlife Service.

# Îles de Contrecoeur National Wildlife Area

Îles de Contrecoeur National Wildlife Area (NWA) is made up of 22 small and low-lying islands surrounded by marshes and aquatic grass beds distributed along a 10-kilometre stretch of the St. Lawrence River and that are part of the towns of Contrecoeur and Lavaltrie. Created in 1981 by Environment and Climate Change Canada (at the time Environment Canada), the purpose of this NWA is to conserve a remarkable network of emergent and submerged grass beds as well as islands with high nesting potential for waterfowl in the Montreal region.

With its landscape of grassy plains, the NWA area is dotted with low-lying alluvial islands that are exposed to seasonal water level variations of the St. Lawrence and are largely submerged during the spring freshet. These islands are covered mainly by high grasses and, in some cases, by a few trees such as willows, silver maples and red ashes. Some of them are entirely covered with the reed canarygrass, an invasive plant that is suitable for waterfowl nesting.

Wetlands populated with cattails, bulrushes, arrowheads and submerged water-milfoil beds lie around the islands, linking them together. Hundreds of ducks and waterbirds feed there during breeding and migration. The NWA is home to about 205 plant species, at least 78 bird species and 12 mammal species.

At the time of the NWA's creation and up to the mid-1990s, the Contrecoeur archipelago supported the highest breeding pair density of gadwalls in Quebec as well as being an important nesting site for other waterfowl species. Even today, the NWA and the other islands of the archipelago still seem to be a significant nesting site for the gadwall and other dabbling duck species, including the mallard, the Northern pintail and the black duck. Other waterfowl species frequent the area, particularly the Canada goose and diving duck species such as the ring-necked duck, the common merganser and the common goldeneye. Other birds observed there include, the American bittern, the Virginia rail, the marsh wren, the red-winged blackbird, the swamp sparrow and the yellow warbler. The archipelago additionally supports a number of mammals, including the muskrat, the striped skunk, the raccoon, the red fox, along with a few species of shrews, voles and bats.

For conservation reasons, access to the land portion of the NWA's islands is prohibited. However, fall hunting for migratory birds and sport fishing from a boat are permitted around the islands.

The NWA is exposed to a number of threats and presents various management challenges<sup>1</sup>, including transportation and service corridors (related to shoreline erosion), pollution, invasive or otherwise problematic species, diseases and genes, human presence and disturbance, natural system modifications, climate change and extreme weather events, residential and commercial development (shoreline) and scientific knowledge gaps.

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 natural habitat conservation on adjacent lands in order to foster connectivity and improve ecological conditions; 4) ensure ecological monitoring of the NWA and improve knowledge on wildlife species and their habitats; 5) promote 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 based on priorities and available resources.

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

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<sup>1</sup> The nomenclature of the threats and management challenges is based on the Threats Classification System of the International Union for the Conservation of Nature (IUCN, 2012; see also Salafsky et al., 2008).



# Table of Contents

<b>1 DESCRIPTION OF THE PROTECTED AREA.....</b>	<b>1</b>
1.1 Regional Context .....	6
1.2 Historical Background.....	7
1.2.1 Prehistoric Period.....	7
1.2.2 Historic Period.....	7
1.3 Land Ownership .....	9
1.4 Facilities and Infrastructure.....	9
<b>2 ECOLOGICAL RESOURCES .....</b>	<b>13</b>
2.1 Terrestrial and Aquatic Habitats.....	13
2.1.1 Topography and Physical Geography.....	13
2.1.2 Vegetation.....	13
2.2 Wildlife Species .....	16
2.2.1 Invertebrates .....	16
2.2.2 Fish.....	16
2.2.3 Amphibians and Reptiles.....	17
2.2.4 Birds.....	17
2.2.5 Mammals.....	20
2.3 Species at Risk.....	21
2.4 Invasive Species.....	23
<b>3 THREATS AND MANAGEMENT CHALLENGES .....</b>	<b>25</b>
3.1 Transportation and Service Corridors .....	25
3.1.1 Shoreline Erosion.....	25
3.2 Pollution.....	26
3.2.1 Industrial Effluents.....	26
3.2.2 Contaminated Sediments .....	26
3.2.3 Domestic and Urban Waste Water .....	27
3.2.4 Accidental Spills .....	27
3.3 Invasive or Otherwise Problematic Species, Diseases and Genes .....	27
3.3.1 Invasive Plants and Problematic Animals .....	27
3.3.2 Canada Goose, Population of the Temperate Regions.....	28
3.4 Human Presence and Disturbance .....	28
3.5 Natural System Modifications .....	29
3.5.1 Dams and Water Management or Use .....	29
3.6 Climate Change and Extreme Weather Events.....	29
3.7 Residential and Commercial Development .....	30
3.8 Scientific Knowledge Gaps .....	30
<b>4 GOALS AND OBJECTIVES.....</b>	<b>31</b>
4.1 Vision.....	31
4.2 Goals and Objectives.....	31
4.3 Evaluation.....	32
<b>5 MANAGEMENT APPROACHES.....</b>	<b>37</b>
5.1 Habitat Management .....	37

5.2	Wildlife Management .....	37
5.3	Monitoring.....	37
5.4	Research .....	38
5.5	Public Information and Outreach.....	38
<b>6</b>	<b>AUTHORIZATIONS AND PROHIBITIONS.....</b>	<b>39</b>
6.1	Prohibition of Entry .....	39
6.2	Authorized Activities .....	39
	6.2.1 <i>Migratory Bird Hunting</i> .....	40
	6.2.2 <i>Sport Fishing</i> .....	40
6.3	Authorizations.....	40
6.4	Exceptions.....	41
6.5	Other Federal and Provincial Authorizations .....	41
<b>7</b>	<b>HEALTH AND SAFETY .....</b>	<b>42</b>
<b>8</b>	<b>ENFORCEMENT .....</b>	<b>43</b>
<b>9</b>	<b>PLAN IMPLEMENTATION .....</b>	<b>44</b>
<b>10</b>	<b>COLLABORATORS .....</b>	<b>45</b>
<b>11</b>	<b>LITERATURE CITED .....</b>	<b>49</b>

# 1 DESCRIPTION OF THE PROTECTED AREA

Îles de Contrecoeur National Wildlife Area is approximately 10 kilometres long and covers an area of roughly 300 hectares in the St. Lawrence River between the riverside towns of Contrecoeur and Lavaltrie, of which it is part. It is made up of 22 of the 38 islands forming the Contrecoeur archipelago, which are located on either sides of the St. Lawrence Seaway. This protected area was created in 1981 by Environment and Climate Change Canada (at the time Environment Canada) to protect a remarkable network of emergent and submerged grass beds as well as islands with high nesting potential for waterfowl in the Montreal region, including the gadwall (*Anas strepera*). At the NWA's creation and up to the mid-1990s, the Contrecoeur archipelago was an important nesting site of the gadwall in Quebec since it supported the highest breeding pair density of the species in Québec (Mercier et al., 1986; Giroux and Rail, 1995; Armellin and Mousseau, 1998). The NWA and the archipelago still seem to be a major nesting site for the gadwall and other dabbling duck species, including the mallard (*Anas platyrhynchos*), the northern pintail (*Anas acuta*) and the black duck (*Anas rubripes*) (Rivard et Giguère, 2014), but this remains to be confirmed. Figure 1 and Table 1 summarize the general information about this NWA.

This protected area contains 22 low-lying alluvial islands (Figures 1 and 2), many of which become fully submerged during the spring freshet. Certain areas of the islands are made up of highlands and buttes formed by deposits from the seaway dredging (Pilon et al., 1980). The submerged and emergent grass beds, low marshes and wet meadows make up the bulk of the NWA's plant life. The reed canarygrass (*Phalaris arundinacea*) is found here, which is a plant that completely covers certain islands and is suitable for waterfowl nesting. Also found here are submerged water-milfoil beds that lie around the islands, linking them together.

The NWA also contains some shrub and tree swamps (Pilon et al., 1980; Armellin and Mousseau, 1998; Labrecque and Jobin, 2013). The treed areas consist mainly of willows (*Salix sp.*), ashes (*Fraxinus sp.*) and a few eastern cottonwoods (*Populus deltoides*) and silver maples (*Acer saccharinum*) (Mercier et al., 1986; Armellin and Mousseau, 1998).

**Table 1: Information on Îles de Contrecoeur National Wildlife Area**

<b>Protected Area Designation</b>	National Wildlife Area
<b>Province or Territory</b>	Quebec – Town of Contrecoeur, Regional County Municipality of Marguerite-D'Youville and Town of Lavaltrie, Regional County Municipality of D'Auray
<b>Latitude and Longitude</b>	45°22'N and 73°15'W
<b>Size</b>	298.36 ha
<b>Protected Area Selection Criteria (Protected Areas Manual<sup>1</sup>)</b>	Criterion 1a – The area supports a population of species or subspecies or a group of species that is concentrated during any portion of the year.
<b>Protected Area Classification System (Protected Areas Manual<sup>1</sup>)</b>	Category A – Species or critical habitat conservation
<b>International Union for Conservation of Nature (IUCN<sup>2</sup>) Classification</b>	Category III – Natural monument or feature
<b>Order-in-Council Number</b>	PC 1981-1375
<b>Directory of Federal Real Property (DFRP) Number</b>	Property 06785. A contaminated site is present in the NWA: an old back light (site 00002524) located on Île de Saint-Chef. <a href="http://www.tbs-sct.gc.ca/dfrp-rbif/home-accueil-eng.aspx">http://www.tbs-sct.gc.ca/dfrp-rbif/home-accueil-eng.aspx</a>
<b>Gazetted</b>	1981 – <a href="#">Legal description</a>
<b>Additional Designations</b>	Îles de Contrecoeur National Wildlife Area (except Île Mousseau), private islands, the shores of Contrecoeur and the adjacent areas have been designated as an Important Bird Area (IBA of Îles de Contrecoeur National Wildlife Area).
<b>Faunistic<sup>3</sup> and Floristic<sup>4</sup> Importance</b>	The NWA supports a remarkable network of emergent and submerged grass beds as well as islands with high nesting potential for waterfowl in the Montreal region. The NWA and the Contrecoeur archipelago have already been and still seem to be an important nesting site for the gadwall and other species of dabbling ducks in the province. The archipelago supports a large colony of ring-billed gulls, which may occasionally nest in the NWA.
<b>Invasive Species</b>	A number of species, including the flowering rush, the reed canarygrass, the purple loosestrife, the European reed, the curly-leaved pondweed and the zebra mussel.
<b>Species at Risk</b>	The NWA supports at least seven species designed under Canada's <i>Species at Risk Act</i> (SARA), among which the barn swallow, one bat of the <i>Myotis</i> genus and the copper redbird, as well as fourteen species that are threatened, vulnerable or likely to be designated as such under Quebec's <i>Act respecting threatened or vulnerable species</i> (ARTVS), including the Nelson's sparrow, the Caspian tern, the sedge wren and the green dragon.
<b>Management Agency</b>	Environment and Climate Change Canada (Canadian Wildlife Service)
<b>Public Access and Use</b>	Public access to the islands of the NWA is prohibited in order to protect the breeding birds from human-induced disruptions. However, fall hunting of migratory birds and fishing are authorized around the islands from a boat, in accordance with the regulations in effect.

<sup>1</sup> Environment Canada, 2005a

<sup>2</sup> IUCN, 2008

<sup>3</sup> Source of the names of vertebrate wildlife species: MFFP, 2018a

<sup>4</sup> Source of the names of plants species: Brouillet et al., 2010+ (VASCAN, names accepted)

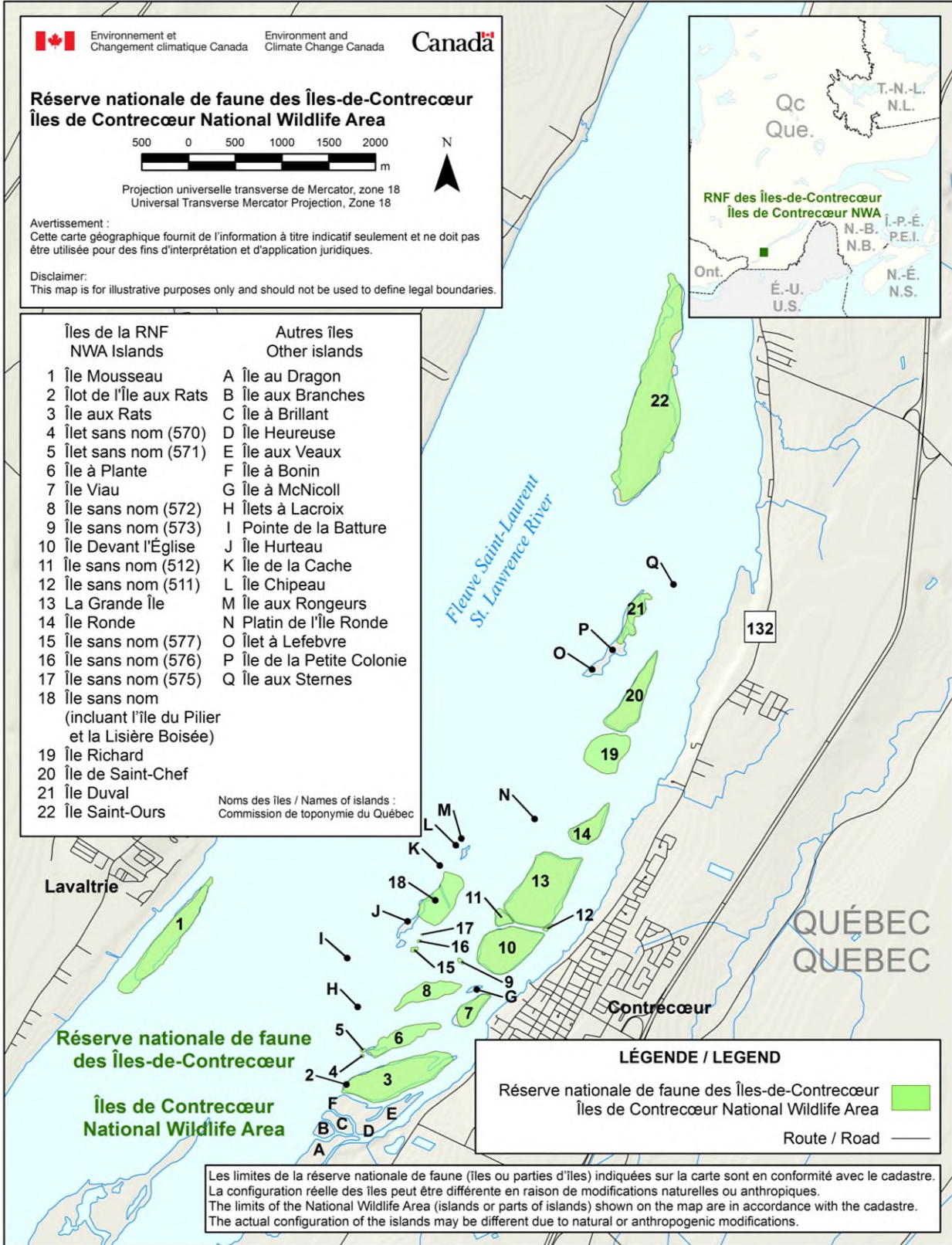


Figure 1: Îles de Contrecoeur National Wildlife Area

Some islands in the Contrecœur archipelago have multiple names. Table 2 gives the naming or namings chosen for each of them and the names used in the various documents consulted. In addition, some of the islands acquired when the NWA was created do not have names and have not been named by Quebec's *Commission de toponymie*. Also, a number of them have never been entered into the land register. Also, the size and shape of the islands may have changed since the creation of the NWA due to natural changes (e.g. changes in the aquatic grass beds, sedimentation, erosion) or human-induced changes (e.g. dredging deposits) that have occurred in recent years.



**Figure 2: Aerial view of Îles de Contrecœur National Wildlife Area in the spring**  
Photo: Christine Lepage © Environment and Climate Change Canada, CWS

**Table 2: Names of the islands in Îles de Contrecoeur NWA**

Island Name <sup>a</sup>	Other names	Size (ha)
Île Mousseau		25.67
Îlot de l'Île aux Rats		3.15
Île aux Rats		29.72
Unnamed islet (former lot 570)	Île à Plante <sup>1</sup>	0.11
Unnamed islet (former lot 571)	Île à Plante <sup>1</sup>	0.17
Île à Plante		10.43
Île Viau	Île aux Oignons	6.39
Unnamed island (former lot 572)		9.39
Unnamed island (former lot 573)		0.26
Île Devant l'Église		24.24
Unnamed island (former lot 511)		0.36
Unnamed island (former lot 512)	Île Hurteau <sup>1, 2</sup>	2.45
La Grande Île		39.86
Île Ronde	Île Rondeau	8.73
Unnamed island (including Île du Pilier and La Lisière Boisée)	Île aux Morpions (former lot 574) Île aux Peupliers <sup>1</sup> Île Lamoureux <sup>1</sup> Îlets à Lacroix <sup>1</sup>	14.82
Unnamed island (former lot 575)		0.03
Unnamed island (former lot 576)		0.11
Unnamed island (former lot 577)		0.32
Île Richard	Îlet à Lefebvre <sup>1</sup>	15.14
Île de Saint-Chef	Île de Contrecoeur Île aux Bœufs	16.71
Île Duval	Île Dorval	6.60
Île Saint-Ours	Île Commune	83.67
<b>Total</b>		<b>298.33</b>

a. Commission de toponymie du Québec, 2018. These names were used in preparing this management plan.

1. EnviroServices, 2011

2. Argus, 1992

## 1.1 REGIONAL CONTEXT

Îles de Contrecœur NWA is formed from a string of islands located in the St. Lawrence River and that are part of the towns of Contrecœur and Lavaltrie. Contrecœur, which has roughly 6,900 residents and covers 61.6 km<sup>2</sup>, is located in the Regional County Municipality (RCM) of Marguerite-d'Youville, in northern Montérégie. Originally an agriculturally based municipality, Contrecœur has seen the arrival of a number of iron and steel companies over the past few decades, stimulating its industrial and economic development (Ville de Contrecœur, 2015). Its riverside location and closeness to the St. Lawrence Seaway favoured the establishing of such companies and the development of port activities. This port orientation will soon be strengthened by the extension of the port terminal (addition of a container terminal). The town also has two marinas. Moreover, residential construction there is booming: it is estimated that, within 10 years, Contrecœur may have 1,500 additional dwellings.

Lavaltrie, which has roughly 13,700 residents and covers about 70 km<sup>2</sup>, is located in the RCM of D'Autray, in southern Lanaudière. Once a holiday resort, the town now has an urban and rural residential orientation and also has many attractions including its pier for launching various watercraft, its boardwalk and its Victorian houses (Ville de Lavaltrie, 2015).

Moreover, the region has a high-quality natural environment with its islands, surrounding water and its many wooded stretches conducive to many tourism and outdoor activities such as nature observation, pleasure boating, fishing and hunting. The islands immediately southwest of the NWA belong to the company ArcelorMittal. Also, the municipal woods, designated as "*natural heritage*" and protected by the municipal authorities, have good tourism potential (MRC de Marguerite-D'Youville, 2018). The regional stakeholders are particularly interested in enhancing the natural areas, especially at the edges of the NWA. Pilot activities for a river shuttle and animated cruises on the St. Lawrence were established in 2013 and offered in 2014. They were not renewed in 2015, but could be continued later. Also, some conservation groups are working together on raising public awareness and protecting the NWA, including Nature Québec, which is a partner of the Important Bird Area (IBA) program, and the Comité ZIP des Seigneuries, which provides interpretation activities from a boat.

For the purpose of conserving and protecting breeding birds, access to the NWA's islands is prohibited. However, fall hunting of migratory birds and fishing are permitted around the NWA's islands from a boat.



## **1.2 HISTORICAL BACKGROUND**

### **1.2.1 Prehistoric Period**

Like the other islands of the St. Lawrence, the Contrecoeur islands were likely used as a stopover or a seasonal camp by Aboriginal peoples before the arrival of Europeans. However, since this archipelago has not been the subject of an archeological study, the identity of the territory's occupants and its occupation period are unknown (Mercier et al., 1986).

### **1.2.2 Historic Period**

#### Aboriginals and European Settlement

It is known, however, that since the 1700s, the Odanak and Wôlinak Abenakis, who settled near the Saint-François and Bécancour rivers, used the Contrecoeur archipelago for harvesting the black ash (*Fraxinus nigra*) and the sweet grass (vanilla grass, *Anthoxanthum nitens*) for their basketry and for hunting waterfowl (M. Durand, Odanak's Environment and Lands Office, pers. comm., 2015). It is also hard to find information on the use of the Contrecoeur archipelago by the first French colonists. Besides, very little is known about the islands' early forests other than they disappeared in the early 18th century to make way for pastures (De Repentigny, 1988). In fact, as of 1712, Contrecoeur's landowners were raising farm animals on the islands, a usage that continued into the 20th century (Rheault et al., 1981).

The French settled on the south shore of the St. Lawrence from 1667, the year when Antoine Pécaudy, Sieur de Contrecoeur, Captain of the Carignan-Salières regiment, founded a settlement there about 52 kilometres downstream from Montreal. A seigniory two leagues wide along the river and two leagues deep was then officially granted to him in 1672 by the intendant Jean Talon, on behalf of the King of France (Ville de Contrecoeur, 2015). That grant included the islands at the front of the seigniory (De Repentigny, 1988).

In addition, Île Mousseau was an integral part of the seigniory awarded by Jean Talon in 1672 to Sieur Margane de Lavaltrie on the north shore of the St. Lawrence, whereas Île Saint-Ours was granted to Sieur de Saint-Ours in 1674, as an integral part of the seigniory of the same name, obtained two years earlier (De Repentigny, 1988).

#### Development of the Town of Contrecoeur

It was in the early 1900s that the first shoe factories were built, transforming the town's economic landscape, which until then was limited to a few craftsmen and merchants providing services to the local farmers. That industry caused the urban population to increase and diversified the local economy. In the late 1950s, the parish saw the arrival of major iron and steel companies, which firmly rooted Contrecoeur's industrial orientation (Ville de Contrecoeur,

2015). The town of Contrecœur was created in 1997 with the merging of the parish and the village of Contrecœur.

### The Archipelago's Abundance

In the 1980s and 1990s, the Contrecœur archipelago was known province-wide for being particularly abundant in certain waterfowl species, including the gadwall (Mercier et al., 1986; Giroux et al., 1995). There are little recent data on this subject, but this territory certainly presents a high nesting potential for waterfowl and is probably still a unique site for waterfowl reproduction in the greater Montreal area.

Sport fishing is a major activity in this archipelago, which has always been greatly used by fishermen. Also, commercial fishing for the lake sturgeon (*Acipenser fulvescens*) was engaged in there until 2012. Additionally, since 2015, commercial fishing for the common carp (*Cyprinus carpio*) has been done with fishing gear that helps protect the copper redhorse (*Moxostoma hubbsi*) (C. Côté, MFFP-Lanaudière, pers. comm., 2015) around the islands.

It is in the fall, during the waterfowl hunting period, that human activity is most intense in the archipelago. The site is greatly favoured by waterfowl hunters, who go especially to the Chenal des Chasseurs and the northwest edge of the archipelago (Lehoux et al., 1985 in De Repentigny, 1988; J. Rodrigue, CWS, pers. comm., 2015).

### National Wildlife Area

Since development pressures are very high and steadily increasing in the suburbs of the Quebec metropolis, whether through vacationing, recreation or urbanization, the NWA status of this wildlife territory is paramount.

In 1974, to preserve this critical place for waterfowl reproduction in the Montreal metropolitan area, the Government of Canada acquired several islands of the Contrecœur archipelago. It first purchased Grande Île and then other islands and islets. The territory thus acquired was given National Wildlife Area status on May 28, 1981. Île Mousseau was acquired in 1985 (De Repentigny, 1988) and incorporated into the NWA, whereas Île Saint-Ours, owned by the Government of Canada since 1961, was given Migratory Bird Sanctuary (MBS) status in 1986 and then incorporated into the NWA in 1996. Its MBS status was dropped at that point (R. Langevin, CWS, pers. comm., 2014).

In addition, the NWA already included certain adjacent islands, namely Île au Dragon, Île aux Branches, Île à Brillant, Île à Bonin, Île aux Veaux and Île Heureuse, owned by the company ArcelorMittal (formerly Sidbec-Dosco) under a legal agreement established in 1978 (De Repentigny, 1988). That agreement expired in 1998 and was not renewed (CWS, 2003).

The Canadian Wildlife Service of Environment and Climate Change Canada (at the time Environment Canada) carried out the first Îles de Contrecoeur National Wildlife Area management plan in 1986 (Mercier et al, 1986) and a conservation plan in 2003 (CWS, 2003).

### 1.3 LAND OWNERSHIP

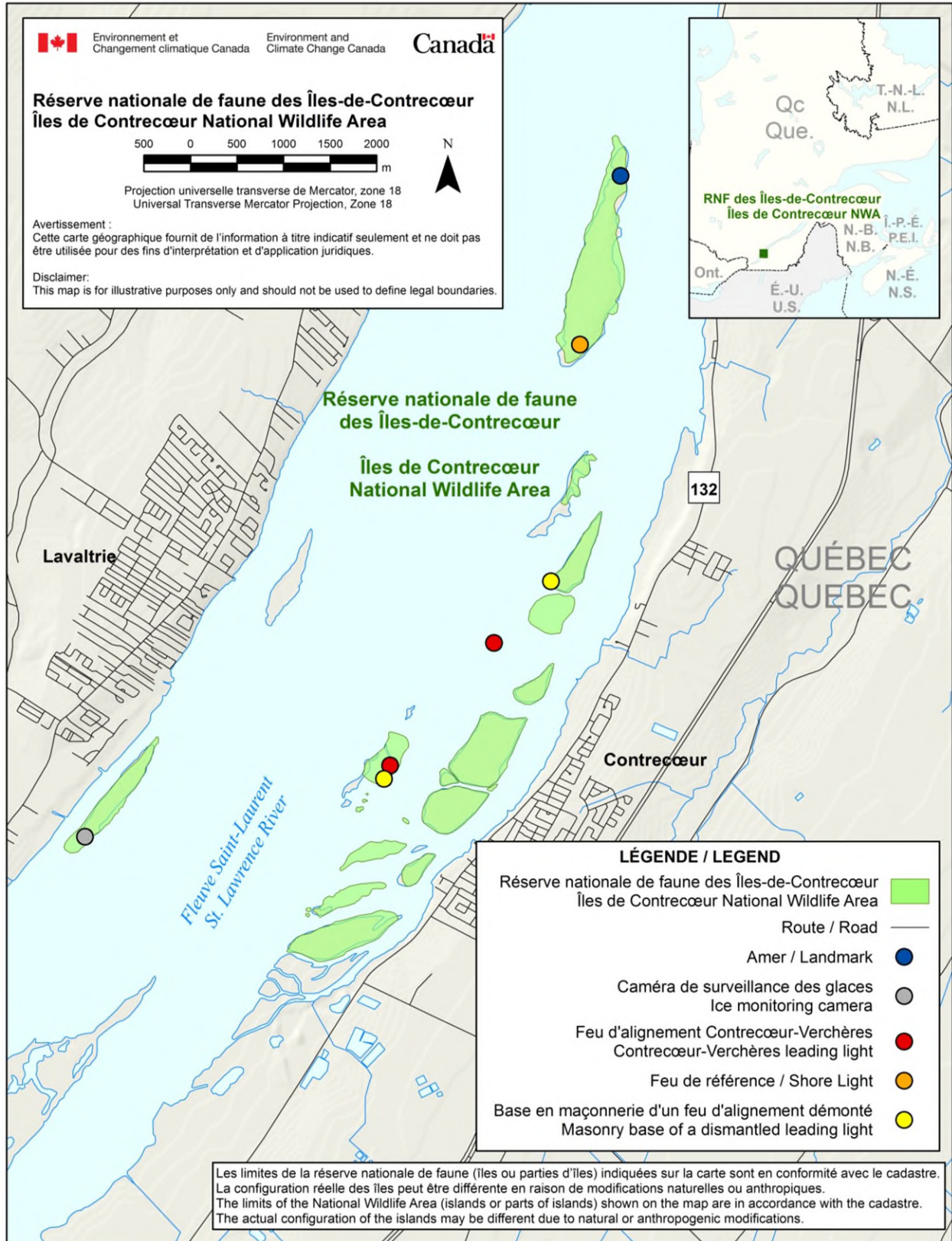
All the lands making up the Îles de Contrecoeur National Wildlife Area are owned by the Government of Canada and are managed by Environment and Climate Change Canada.

### 1.4 FACILITIES AND INFRASTRUCTURE

Among the facilities and infrastructure within the NWA (Table 3 and Figures 3 to 7), there are three navigation aids, namely a leading light on the shoals near La Lisière Boisée island (Figure 4), a reference light (shore light) on the southern tip of Île Saint-Ours and a landmark on the northern tip of the same island (Figure 5). Also, an ice-monitoring camera is installed on a tower at the west end of Île Mousseau (Figure 6). These facilities all belong to Fisheries and Oceans Canada (DFO) and require only periodic monitoring. In addition, there are two masonry foundations for old leading lights that are now dismantled, one near the leading light mentioned in Table 3, the other on Île de Saint-Chef (Figure 7). Those structures, although decommissioned, are major landmarks for mariners. A second leading light is on the archipelago's shoals outside the NWA. Traces of contaminants are still present at the base of the masonry foundation on Île de Saint-Chef (Treasury Board of Canada Secretariat, 2018). That site presents no significant environmental issues (EnviroServices, 2011).

**Table 3 : Facilities and infrastructure in Îles de Contrecoeur National Wildlife Area**

Type of Infrastructure	Island	Manager (or owner)
Leading light (navigation tower; front leading light "Contrecoeur-Verchères"; DFRP no. 82436	Unnamed island (including Île du Pilier and La Lisière Boisée island)	DFO
Landmark; DFRP 06798	Île Saint-Ours	DFO
Reference Light	Île Saint-Ours	DFO
Ice-monitoring camera on a tower; DFRP 82301	Île Mousseau	DFO
Masonry foundation	Near the leading light of the unnamed island (including Île du Pilier and La Lisière Boisée island)	ECCC
Masonry foundation	Île de Saint-Chef	ECCC



**Figure 3: Facilities and infrastructure in Îles de Contrecoeur National Wildlife Area**



**Figure 4: Leading light (centre), near La Lisière Boisée island, and masonry foundation of a dismantled light (right), in the spring**  
Photo: Christine Lepage © Environment and Climate Change Canada, CWS



**Figure 5: Landmark, Île Saint-Ours, in the spring**  
Photo: Christine Lepage © Environment and Climate Change Canada, CWS



**Figure 6: Base tower of the ice-monitoring camera, Île Mousseau, in the spring**  
Photo: Christine Lepage © Environment and Climate Change Canada, CWS



**Figure 7: Masonry foundation of a dismantled navigation light, Île de Saint-Chef**  
Photo: Christine Lepage © Environment and Climate Change Canada, CWS

## 2 ECOLOGICAL RESOURCES

### 2.1 TERRESTRIAL AND AQUATIC HABITATS

#### 2.1.1 *Topography and Physical Geography*

The NWA consists primarily of low-lying alluvial islands usually flooded in the spring and during part of the summer. The water level is usually at the lowest in October and highest in April. There can be a difference of 1.5 metre between these two extremes (Morin and Bouchard, 2000). Other islands consist partly of highlands that, in some places, include buttes formed of deposits from the seaway dredging. Some lower areas of these islands, especially around the periphery, are flooded in the spring. The soil texture varies within the archipelago, ranging from clay to silt loam to sand (CWS, 2003).

The types of habitats in the NWA can vary from year to year depending on water level and island erosion. They can also vary within the same year, especially in the spring during the freshet and in the summer when there are more emerging marshes (Labrecque and Jobin, 2013).

The islands in the Contrecœur region are highly exposed to shoreline erosion (Figure 8). This occurs especially on the islands near the seaway, including the unnamed islands (lots 574 to 577), Île Duval and Île Saint-Ours (east shore) (De Repentigny, 1988). Before the introduction of the voluntary program for reducing the speed of boats using the seaway, there was over 10 kilometres of shoreline greatly affected by erosion (Argus, 1992). Since then, that erosion has been reduced by over 55% (Dauphin and Lehoux, 2004; Richard, 2010).

#### 2.1.2 *Vegetation*

The Contrecœur archipelago is part of the hardwood zone of the maple/bitternut hickory (*Carya cordiformis*) stand. It is ecological region 1a of the plaine du bas Outaouais et de l'archipel de Montréal (Saucier et al., 2011).

These islands are essentially covered with plant beds made up of submerged and emerging vegetation, low marshes that are flooded for most of the summer and wet meadows. They also have shrub and tree swamps. The treed areas are located mainly on the west shore of Île Saint-Ours and, to a lesser degree, on Grande Île, Île Duval and La Lisière Boisée island. They are made up of willows, ashes and a few Eastern cottonwoods and silver maples (Pilon et al., 1980, Armellin and Mousseau, 1998 and Mercier et al., 1986 in Rivard and Giguère, 2014).

An analysis of changes in the wetlands of the Contrecœur region shows a drying out of these environments, mainly through the filling of the canals between the islands (Jean and Létourneau, 2011). In fact, between 1990 and 2002, many changes were seen in these

environments. Low marshes turned into either high marshes (flooded during the spring freshet) dominated by the reed canarygrass and the European reed (*Phragmites australis*), or into shrub swamps. Also seen, but to a lesser degree, are high marshes and tree swamps turning into low marshes, especially on Île Saint-Ours where tree swamps and shrub swamps turning into high marshes are also seen (Jean and Létourneau, 2011).

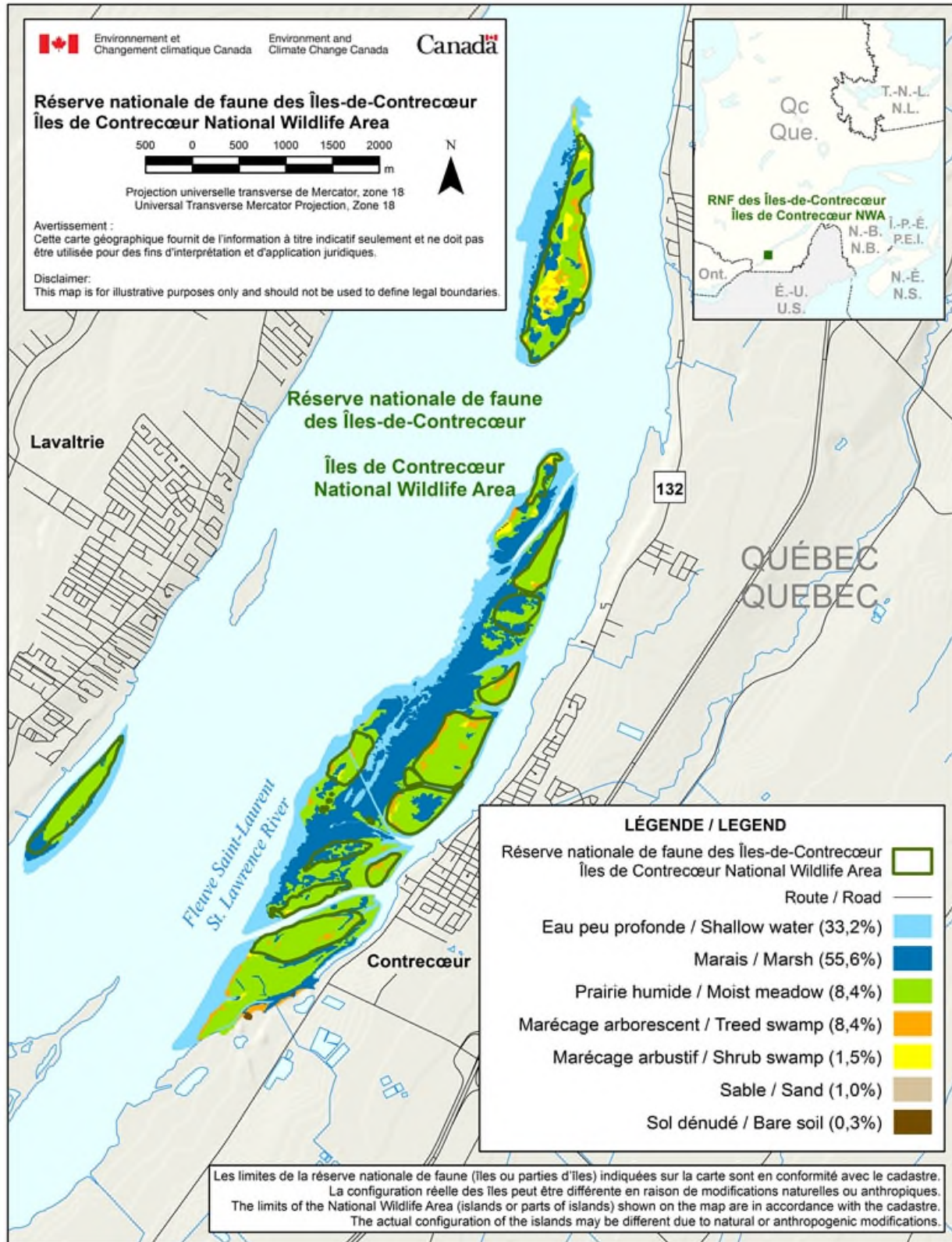
In 2002, the reed canarygrass was very abundant in the NWA, and the European reed showed a remarkable increase (Jean and Létourneau, 2011).

The driest lands in the NWA, made up of wet meadows and swamps, cover an area of about 55 hectares (Figure 9). Those sectors, which used to be farmed, received sediments from the seaway dredging (De Repentigny, 1988).



**Figure 8: Erosion on Île Saint-Ours in June 1999; slope 3.5 m high**  
Photo: Denis Lehoux © Environment and Climate Change Canada, CWS





**Figure 9: Types of habitats in the Contrecoeur archipelago**

Source: Environment Canada, Canadian Wildlife Service, unpublished Géomont data, 2010

## **2.2 WILDLIFE SPECIES**

### **2.2.1 Invertebrates**

In 2004, a group of freshwater mussels (*Unionidae* family) were surveyed essentially through the gathering of dead specimens found on the shorelines of the NWA's islands. Eighty-one percent of the shells gathered, all species combined, were empty and therefore could have been carried by the current or the ice (A. Paquet, MFFP, pers. comm., 2015). That survey identified seven native freshwater mussel species in the waters around the NWA (Rivard and Giguère, 2014; A. Paquet, MFFP, pers. comm., 2015), including the eastern elliptio (*Elliptio complanata*) and the eastern lampmussel (*Lampsilis radiata*). These two species, which are widespread and abundant, are experiencing competition from exotic mussel species (Rivard and Giguère, 2014). Five other freshwater mussel species less common in Quebec were also identified: the plain pocketbook (*Lampsilis cardium*) and the black sandshell (*Ligumia recta*), rare in Quebec, as well as the elephant ear (*Elliptio crassidens*), the spike (*Elliptio dilatata*) and the hickorynut (*Obovaria olivaria*), the latter three being likely to be designated as threatened or vulnerable by the province (Paquet et al., 2005 in Rivard and Giguère, 2014; A. Paquet, MFFP, pers. comm., 2015). All the shells of the latter species were empty, indicating that the live individuals were probably upstream from the NWA.

Moreover, exotic freshwater mussels were observed during that survey, even though no count was done. The zebra mussel (*Dreissena polymorpha*) widely dominated the population of the shellfish beds surveyed, but no shells of the quagga mussel (*Dreissena bugensis*), another exotic species in the fluvial section of the St. Lawrence, were seen (Rivard and Giguère, 2014).

### **2.2.2 Fish**

In the waters adjacent to the NWA, 36 fish species were identified (MFFP-SLGO, 2015). These include the yellow perch (*Perca flavescens*), the walleye (*Sander vitreus*), the sauger (*Sander canadensis*), the northern pike (*Esox lucius*), the lake sturgeon, the largemouth bass (*Micropterus salmoides*), the smallmouth bass (*Micropterus dolomieu*), the common carp, the trout-perch (*Percopsis omiscomaycus*), the logperch (*Percina caprodes*), the white sucker (*Catostomus commersonii*), the pumpkinseed sunfish (*Lepomis gibbosus*) and even the longnose gar (*Lepisosteus osseus*) in addition to a number of minnow and shiner species, such as the spottail shiner (*Notropis hudsonius*) and the bridle shiner (*Notropis bifrenatus*), a species likely to be designated threatened or vulnerable in Quebec (MFFP-SLGO, 2015). The river redhorse (*Moxostoma carinatum*), which is designated vulnerable in Quebec and of special concern in Canada, and the copper redhorse (*Moxostoma hubbsi*), which is designated

threatened in Quebec and endangered in Canada, also frequents the channels of the Îles de Contrecoeur islands (DFO, 2012).

The Contrecoeur archipelago supports the spawning grounds of nine fish species, namely the bowfin (*Amia calva*), the common carp, the northern pike, the brown bullhead (*Ameiurus nebulosus*), the pumpkinseed sunfish, the largemouth bass, the golden shiner (*Notemigonus crysoleucas*), the yellow perch and the black crappie (*Pomoxis nigromaculatus*) (Massé and Mongeau, 1976 in CWS, 2003).

### **2.2.3 Amphibians and Reptiles**

Seven anuran species were identified in the NWA territory in 2004: the American toad (*Anaxyrus americanus*), the spring peeper (*Pseudacris crucifer*), the wood frog (*Lithobates sylvaticus*), the mink frog (*Lithobates septentrionalis*), the leopard frog (*Lithobates pipiens*), the green frog (*Lithobates clamitans*) and the American bullfrog (*Lithobates catesbeianus*) (Rivard and Giguère, 2014). These species are largely distributed on the NWA territory, but not very abundant. No reptile species were seen during those surveys.

### **2.2.4 Birds**

The Contrecoeur archipelago is an important site for wildlife in the Montreal region. Among the St. Lawrence archipelagos located between Montreal and Sorel, it has already been and is maybe still one of the most important habitat for waterfowl reproduction. The Contrecoeur archipelago and shores are recognized as an important bird area (IBA). A survey conducted in the NWA in 2004 identified 78 birds species, which is only a fraction of the bird species observed in this protected area during the year (Rivard and Giguère, 2014). Besides, about 85 bird species were reported by birdwatchers in the Contrecoeur archipelago between 1993 and 2004 (Larivée, 2014 : 1993 to 2004 ÉPOQ data) and in 2014 and 2016 (eBird, 2016<sup>2</sup>).

#### Migration

There are little recent data on the use of the NWA by waterfowl, since most studies on the subject date back to more than 15 years ago (Rivard and Giguère, 2014). It seems however that this protected area and the Contrecoeur islands act as a migration stopover for avian species that nest in the north, such as the Canada goose (*Branta canadensis*), which is particularly abundant during the spring migration (J. Rodrigue, pers. comm., 2015; Rivard et Giguère, 2014) and for many duck species, particularly the mallard, the black duck and several other dabbling duck species that also nest there (see Nesting below). The archipelago is also

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<sup>2</sup> The eBird data for the NWA are fragmentaries and cover only 2014 and 2016.

used by diving ducks such as the ring-necked duck (*Aythya collaris*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), common goldeneye (*Bucephala clangula*), hooded merganser (*Lophodytes cucullatus*) and common merganser (*Mergus merganser*) (Rivard and Giguère, 2014; Larivée, 2014; eBird, 2016).

### Nesting

There are little recent data about the waterfowl nesting in the NWA, since most of the studies on the subject were performed between the 1970s and the 1990s. In the 1970s, a study on the gadwall, a newly established species in Quebec at that time, showed that this duck was mainly found in the St. Lawrence Valley, west of Trois-Rivières, in the spring and fall, while nesting birds occurred on islands in the Montréal area, notably the Contrecoeur islands (Cantin et al., 1976). In May 1975, a survey counted 322 duck nests in this archipelago, about half of which belonged to the gadwall and a quarter belonged to the pintail. A mean of 2.62 nest per hectare was counted on islands covered with wildlands and a maximal density of 8.7 nests per hectare on certain of these islands (Cantin and Ringuet, 1978). A subsequent work revealed that, among the archipelagos of the St. Lawrence located between Lake Saint-François (upstream of Montréal) and Trois-Rivières, the Contrecoeur archipelago was the most productive with a mean density of 3.3 duck nests per hectare (Bélanger, 1989). Between 1990 and 1992, however, the number of nests found in the NWA was half that of 1975 (Giroux et al., 1992). In order to maximize the hatching success, a control of duck nest predators was carried out (Giroux et al., 1992; Giroux et al., 1995). In 1994, 342 nests were counted across the NWA, which represented an increase from the previous years, but this increase appeared to be generalized in the islands of the freshwater St. Lawrence and could not be attributed only to the predator control (Giroux et al., 1995). In the early 1990s, the gadwall and the pintail were the predominant nesting duck species, followed by the mallard and the northern shoveler (*Anas clypeata*) (Giroux et al., 1992; Giroux et al., 1995; Lehoux, 2006).

In the 1970s, the breeding ducks of the Contrecoeur archipelago preferred high lands not submerged in the spring, the northern part of the archipelago (particularly île Saint-Ours) and the small islands covered with wildlands (in comparison with inhabited or grazed islands). They most often used dense grasses, primarily the reed canarygrass (Cantin and Ringuet, 1978). However, the ducklings were raised in the channels and marshes of the archipelago's southern islands. The adults did not hesitate to move their broods five kilometres in order to raise them in the dense grass beds that provided suitable food sources and cover for the ducklings (De Repentigny, 1988).

More recently, surveys conducted in 2004, 2007 and 2008 identified nine dabbling duck species that nest in the NWA, namely the mallard, gadwall, northern pintail, black duck, American widgeon (*Anas americana*), northern shoveler, blue-winged teal (*Anas discors*), green-winged teal (*Anas crecca*) and wood duck (*Aix sponsa*) (Rivard and Giguère, 2014). Several diving duck species were also observed, among which the greater scaup, lesser scaup, common goldeneye and bufflehead, but this protected area provides few habitats suitable to most of these species. The ring-necked duck and the hooded merganser are likely to find suitable nesting habitats in the area, but nesting of the species have not been documented (Rivard and Giguère, 2014). Lastly, the Canada goose is a confirmed breeder in the NWA (Rivard and Giguère, 2014; J. Rodrigue, CWS, pers. comm., 2015).

Besides waterfowl, a number of other avian species breed in this protected area. During the reproduction period, there are the Wilson's snipe (*Gallinago delicata*), the American woodcock (*Scolopax minor*) and the spotted sandpiper (*Actitis macularius*) (Rivard and Giguère, 2014). The red-winged blackbird (*Agelaius phoeniceus*), the bank swallow (*Riparia riparia*) (see 2.3 Species at Risk), the American bittern (*Botaurus lentiginosus*), the common gallinule (*Gallinula galeata*), the pied-billed grebe (*Podilymbus podiceps*) and the Virginia rail (*Rallus limicola*) raise their young in the archipelago (De Repentigny, 1988; Rivard and Giguère, 2014). The black tern (*Chlidonias niger*), which reproduced in the archipelago until 2005-2006, was not identified there during surveys done in 2010 (Latendresse and Brousseau, 2010). This species seems to be experiencing a serious decline in Quebec, even though it does not yet have any precarious status in that province or in Canada. Moreover, the Îles de Contrecoeur islands are also used as a feeding area by the great blue heron (*Ardea herodias*), but no heron nesting grounds have been established here, the closest one being on Île Bouchard in front of the municipalities of Verchères and Saint-Sulpice (A. Desrosiers, FAPAQ-Quebec in CWS, 2003).

Among the passerines, besides the bank swallow already mentioned, the most abundant are the swamp sparrow (*Melospiza georgiana*), the yellow warbler (*Setophaga petechia*) and the song sparrow (*Melospiza melodia*), and they likely nest in the NWA. The barn swallow (*Hirundo rustica*) also frequents the protected area (see 2.3 Species at Risk) (Rivard and Giguère, 2014).

Several years ago, there were four colonies of ring-billed gulls (*Larus delawarensis*) in the archipelago, but there are only two left, outside the NWA. The colony on Île Saint-Ours was estimated at 11,268 pairs in 2000. It has been gone from this island since 2001 and appears to have mostly relocated to Îlet à Lefebvre and Île Hervieux (9,173 and 5,503 pairs respectively in 2012) (P. Brousseau, CWS, pers. comm., 2015). The presence of the red fox (*Vulpes vulpes*)

on Île Saint-Ours could be the reason for that relocation, but human disturbance could also be the cause. Ring-billed gulls on Île Hervieux may be detrimental to the vegetation, including plant species with a precarious status, due mainly to their acidic droppings. They also cause cleanliness issues in some municipalities, including Lavaltrie. The potential impacts of the gulls in the NWA should be monitored.

The colony of common terns (*Sterna hirundo*) on Île Saint-Ours, whose population was estimated at 25 pairs in 1999, seems to be gone as well and has not been seen elsewhere in the archipelago (G. Chapdelaine and J.-F. Rail, pers. comm., 2002 in CWS, 2003).

Also, the double-crested cormorant (*Phalacrocorax auritus*) nests on Îlet à Lefebvre, near the NWA (Rivard and Giguère, 2014).

### **2.2.5 Mammals**

Targeted micromammal surveys identified five species in the NWA: the short-tailed shrew (*Blarina brevicauda*), the masked shrew (*Sorex cinereus*), the meadow jumping mouse (*Zapus hudsonius*), the meadow vole (*Microtus pennsylvanicus*) and the white-footed mouse (*Peromyscus leucopus*) (Rivard and Giguère, 2014).

Acoustic surveys for chiroptera confirmed the presence of at least three bat species in the NWA territory or environs (Rivard and Giguère, 2014). The big brown bat (*Eptesicus fuscus*) and the hoary bat (*Lasiurus cinereus*) were identified with certainty. Bats of the genus *myotis* represent the greatest number of recordings. It is probably the little brown bat (*Myotis lucifugus*) or the northern myotis (*Myotis septentrionalis*), but given the strong similarities in the sound characteristics of these two species, it was impossible to confirm the identity of the species. However, based on the ecological preferences of these species, it was probably the little brown bat, which inhabits a broad range of habitats, often near towns (Tremblay and Jutras, 2010). All these species likely use the Îles de Contrecoeur NWA as a feeding site because that protected area does not provide any potential hibernation site for them (Rivard and Giguère, 2014).

The archipelago also provides favourable habitats for the muskrat (*Ondatra zibethicus*), mainly the northwest shores of the Devant l'Église, Hurteau, La Grande Île, Ronde, Richard, de Saint-Chef, Saint-Ours, Mousseau and Lavaltrie islands (Armellin and Mousseau, 1998). Among the terrestrial predators in the NWA, the raccoon (*Procyon lotor*), the striped skunk (*Mephitis mephitis*), the American mink (*Neovision vison*) and the red fox (CWS, 2003) are seen regularly. A study conducted on the Îles de Contrecoeur islands between 1990 and 1992 showed that these predators affect the survival of waterfowl broods and that reducing the mammals that prey on duck nests results in a significant increase in nesting success (Giroux et al., 1992). This is

why predator trapping was done in the archipelago, notably between 1998 and 2009 (SDLA and Turgeon, 1998; SDLA, 2009).

### 2.3 SPECIES AT RISK

Table 4 lists the species at risk or with a precarious status that frequent Îles de Contrecœur National Wildlife Area and adjacent areas and that are likely to use the NWA at some point during the year.

Sedge wren (*Cistothorus platensis*) nesting was reported on Île Saint-Ours in 1991, 1992 and 2004 (Rivard and Giguère, 2014; CWS, 2003). Two bank swallow colonies were identified on this island (M. Labrecque, Nature-Québec, pers. comm., 2015; Nature Québec, 2014). The barn swallow (*Hirundo rustica*) was also seen in the NWA during surveys carried out in June 2004 (Rivard and Giguère, 2014).

Adult and young Caspian terns (*Hydroprogne caspia*) were seen in the NWA in 2005. Indicators of Nelson's sparrow (*Ammodramus nelsoni*) nesting on the Contrecœur archipelago were reported in 2000, but there has been no recent mention of these species for this sector (SOS-POP, 2013). Also, the presence of the short-eared owl (*Asio flammeus*) was previously reported in the NWA in the 1970s (De Repentigny, 1988), but there is no recent report of that species in the NWA (SOS-POP, 2013).

Acoustic surveys carried out in the NWA revealed the presence of the hoary bat, a species likely to be designated threatened or vulnerable in Quebec, and bats of the genus *myotis*. In the latter case, it was impossible to identify the species (see section 2.2.5), but it could be the little brown bat or the northern myotis, both species being designated endangered in Canada (Rivard and Giguère, 2014).

In the waters adjacent to the NWA, the river redhorse and the copper redhorse frequent the channels and aquatic grass beds between the islands (DFO, 2012). The latter is endemic to the Richelieu River and that section of the St. Lawrence. Another fish species, the bridle shiner, frequents essentially the same type of habitat and was observed in 1970, 2001 and 2010 (MFFP-SLGO, 2015). The lake sturgeon (Great Lakes – Upper St. Lawrence populations), also present in the waters around the NWA, is considered by COSEWIC to be threatened and is likely to be designated threatened or vulnerable in Quebec. As for indigenous freshwater mussels, three of the species identified in the waters around the NWA, the elephant ear, the spike and the hickorynut, are likely to be designated threatened or vulnerable in Quebec, the last being also considered as endangered in Canada by the COSEWIC.

Lastly, the NWA supports three plant species that are threatened or vulnerable or likely to be designated as such in Quebec, namely the green dragon (*Arisaema dracontium*), the old switch panicgrass (*Panicum virgatum*) and the Leconte's violet (*Viola sororia*, var. *affinis*) (Sabourin, 2004).

**Table 4: Species at risk in Îles de Contrecoeur National Wildlife Area**

Common and scientific names of species	Status			Presence
	Canada		Quebec	
	SARA <sup>1</sup>	COSEWIC <sup>2</sup>	ARTVS <sup>3</sup>	
<b>Birds</b>				
Nelson's sparrow <i>Ammodramus nelsoni</i>	No status	Not at risk	SLDTV <sup>4</sup>	Previously identified during reproduction period in the archipelago, no recent mention (after 2000).
Bank swallow <i>Riparia riparia</i>	Threatened (Schedule 1)	Threatened	No status	Two colonies in the NWA, on Île Saint-Ours.
Barn swallow <i>Hirundo rustica</i>	Threatened (Schedule 1)	Threatened	No status	Single mention in the NWA; probably uses the NWA as a feeding area.
Caspian tern <i>Hydroprogne caspia</i>	No status	Not at risk	Threatened	Last observed in the NWA in 2005. Nested near the NWA (Île Hervieux) in 2014.
Sedge wren <i>Cistothorus platensis</i>	No status	Not at risk	SLDTV <sup>4</sup>	Confirmed breeder in 1992 in the NWA, on Île Saint-Ours. Last mention in this sector in 2004.
<b>Mammals</b>				
Hoary bat <i>Lasiurus cinereus</i>	No status	No status	SLDTV <sup>4</sup>	Confirmed presence (recordings) in the NWA in 2004.
<i>Myotis</i> sp. (little brown bat, <i>M. lucifugus</i> , <b>and/or</b> northern myotis, <i>M. septentrionalis</i> )	Endangered (Schedule 1)	Endangered	No status	Individuals of the genus <i>Myotis</i> recorded in the NWA in 2004. Identification unconfirmed: probably the little brown bat.
<b>Fish</b>				
Copper redbreast <i>Moxostoma hubbsi</i>	Endangered (Schedule 1)	Endangered	Threatened	Lives in the canals and grass beds between the Îles de Contrecoeur islands.
River redbreast <i>Moxostoma carinatum</i>	Special concern (Schedule 1)	Special concern	Vulnerable	Waters adjacent to the NWA.
Lake sturgeon <i>Acipenser fulvescens</i> (Great Lakes – Upper St. Lawrence populations)	No status	Threatened	SLDTV <sup>4*</sup>	Waters adjacent to the NWA.



**Table 4: Species at risk in Îles de Contrecoeur National Wildlife Area**

Common and scientific names of species	Status			Presence
	Canada		Quebec	
	SARA <sup>1</sup>	COSEWIC <sup>2</sup>	ARTVS <sup>3</sup>	
Bridle shiner <i>Notropis bifrenatus</i>	Special concern (Schedule 1)	Special concern	Vulnerable	Observed in 1970, 2001 and 2010; channels and grass beds between the islands.
<b>Invertebrates</b>				
Elephant ear <i>Elliptio crassidens</i>	No status	No status	SLDTV <sup>4</sup>	Waters around the NWA.
Spike <i>Elliptio dilatata</i>	No status	No status	SLDTV <sup>4</sup>	Waters around the NWA.
Hickorynut <i>Obovaria olivaria</i>	No status	Endangered	SLDTV <sup>4</sup>	Waters around the NWA. Empty shells, possibly carried to the edge of the NWA by the current.
<b>Vascular plants</b>				
Green dragon <i>Arisaema dracontium</i>	Not on Schedule 1 (Special concern on Schedule 3)	Special concern	Threatened	Present in the NWA.
Old switch panicgrass <i>Panicum virgatum</i>	No status	No status	SLDTV <sup>4</sup>	Present in the NWA.
Leconte's violet <i>Viola sororia</i> , var. <i>affinis</i>	No status	No status	SLDTV <sup>4</sup>	Present in the NWA.

1. *Species at Risk Act* of Canada (Species at Risk Public Registry, 2018)
  2. Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2018)
  3. *Quebec Act Respecting Threatened or Vulnerable Species* (MELCC, 2018 and MFFP, 2018b)
  4. Species likely to be designated threatened or vulnerable in Quebec (MELCC, 2018 and MFFP, 2018b)
- \* Population unspecified.

## 2.4 INVASIVE SPECIES

Invasive plant species are widely distributed in the NWA (CWS, 2003). According to plant surveys carried out in 2000 and 2001, eight plant species deemed invasive are present in the NWA. The most common species is the reed canarygrass, which is occurring in the wild both as native and exotic forms that are difficult to distinguish (Grobec, 2006). Also found are the curly-leaved pondweed (*Potamogeton crispus*), the flowering-rush (*Butomus umbellatus*) and the purple loosestrife (*Lythrum salicaria*), the latter having a moderate abundance (CWS, 2003). These three species are exotic. Another invasive exotic plant is currently very abundant and increasing: the European reed. In 2010, that species covered an area of 34 hectares in the Contrecoeur archipelago (i.e. roughly 11% of the archipelago) (Tougas-Tellier et al., 2013).

The waters adjacent to the NWA also support invasive exotic species, including the Eurasian water-milfoil (*Myriophyllum spicatum*), an aquatic plant (CWS, 2003), and the zebra

mussel, which is apparently well established in the channels where the waterflow is low. That species has been responsible for the rapid decline in a number of indigenous mussel populations since 2006 (Gillis and Mackie, 1994 and Paquet et al., 2005 in Rivard and Giguère, 2014). Another exotic invertebrate was identified in the waters adjacent to the NWA, namely the American or rusty crayfish (*Orconectes limosus*), which displaced certain indigenous crayfish species (including *O. virilis* and *O. propinquus*) and now accounts for over 90% of the crayfish observed in the Contrecoeur archipelago (CWS, 2003). The round goby (*Neogobius melanostomus*), an exotic fish species, is also present in the waters adjacent to the NWA (CWS, 2003; MFFP-SLGO, 2015).

### **3 THREATS AND MANAGEMENT CHALLENGES**

Îles de Contrecoeur National Wildlife Area is exposed to a number of threats and presents various management challenges, including transportation and service corridors (connected with shoreline erosion), pollution, invasive or otherwise problematic species, diseases and genes, human presence and disturbance, natural system modifications, climate change and extreme weather events, residential and commercial development (shorelines), and scientific knowledge gaps. These threats and management challenges are described below in order of relative importance based on current knowledge and determined using an analysis tool developed by the CWS (Baril, 2014). The naming and classification of the threats and the assessment of their importance are based on the threat classification system of the International Union for the Conservation of Nature (IUCN, 2012; see also Salafsky et al., 2008).

#### **3.1 TRANSPORTATION AND SERVICE CORRIDORS**

##### **3.1.1 *Shoreline Erosion***

Shoreline erosion is one of the most serious threats to the ecological health of Îles de Contrecoeur National Wildlife Area (CWS, 2003). In the early 2000s, Dauphin and Lehoux (2004) calculated that nearly half of the shorelines in the archipelago, i.e. 14.6 kilometres out of 29.7 kilometres, were under erosion, including one kilometre that was severely eroded. According to these authors, the most affected shorelines retreated 87 metres between 1964 and 2002 (2.29 m/year), which was then the highest erosion rate in the archipelagos between Montreal and Berthier-Sorel, including the Îles de la Paix. In the Contrecoeur archipelago, the high erosion areas were primarily on the islands exposed to the seaway, including Île Saint-Ours and Île Duval as well as the Îlets à Lacroix (Dauphin and Lehoux, 2004; CWS, 2003). This kind of erosion can lead to a loss of important habitats for the breeding birds. It can also affect the islands serving as a barrier against waves and as a protection for the large grass beds used as a rearing area by waterfowl.

The erosion of the Îles de Contrecoeur islands is apparently partly attributable to wave action caused by commercial navigation (CWS, 2003), although a number of natural factors (waves, currents, ice, shore soil and slope) and human-induced factors (water level control) can enter into this process. It appears that navigation and water level fluctuations are leading factors in the erosion rate of the banks of the St. Lawrence River (Richard, 2010). On one hand, the river's water balance is hard to control or predict. On the other hand, very low water levels have a major impact on the retreating banks because the dried clay becomes more crumbly and thus more subject to erosion when the water rises again (Richard, 2010).

Environment and Climate Change Canada monitored the erosion of the islands in this sector between 1998 and 2002 (Dauphin and Lehoux, 2004) and again between 2005 and 2010 (Richard, 2010). The average rate of retreat of certain shoreline stretches went from 1.76 m/year between 1998 and 2002 (Dauphin and Lehoux, 2004) to 1.04 m/year between 2005 and 2010 (Richard, 2010). Since 2000, the voluntary ship-speed-reduction measures proposed by the marine industry have helped reduce the shoreline erosion rate, which remains high even so. Other protection measures need to be considered due to the still high erosion rate and the risks of important habitat losses and disappearance of species at risk or with a precarious status (e.g. the green dragon, the bank swallow).

## **3.2 POLLUTION**

### **3.2.1 Industrial Effluents**

In the St. Lawrence Vision 2000 Action Plan, water pollution related to metallurgical activities in the region was identified as an area where it was a priority to take action for reducing the toxicity of the effluents (CZS, 2003). Considerable efforts have been made to reduce the pollution from effluents in Contrecoeur and elsewhere along the St. Lawrence. Since 1970, contamination of the water, sediments and biological resources from toxic substances has dropped in the St. Lawrence (Lacroix, 2005). However, contaminants connected with industrial activities in Contrecoeur may still persist in the sediments (Pelletier et al., 2014).

### **3.2.2 Contaminated Sediments**

In certain channels of the Contrecoeur archipelago (including the Chenal des Chasseurs), the sediments are highly contaminated with heavy metals and PCBs (Procéan Environnement inc., 2002). In fact, toxic effect threshold overages have been reported there for concentrations of PCBs and heavy metals such as zinc, cadmium, chromium, copper and mercury. According to S. Blais (ECCC, pers. comm., 2016), analysis of the surface sediments carried out in 2013 and 2015 in the channel separating Île aux Veaux and Île aux Rats from the southern shore have revealed numerous exceedances of the management criteria for the St. Lawrence sediments established by Environment Canada and the Quebec Department of Sustainable Development, Environment and Parks (EC and MDDEP, 2007). In fact, high concentrations of cadmium, copper, nickel, mercury, PCB, chlorinated dioxins and furans, and of numerous polycyclic aromatic hydrocarbons (PAH) were observed. Moreover, very high concentrations of zinc, chromium, lead, and petroleum hydrocarbons (c10-c50) were also observed (S. Blais, ECCC, pers. comm., 2016). Finally, high concentrations of butyltins (toxic biocides applied to the hulls of ships to prevent organisms from clinging) – the highest in the

fluvial section – were measured in the sediments around Île aux Rats; the concentrations greatly exceeded the potential effects threshold for aquatic fauna (Pelletier et al., 2014).

### **3.2.3 Domestic and Urban Waste Water**

Sewage discharges from the upstream municipalities along the St. Lawrence can affect the water quality around the archipelago. The St. Lawrence water quality is greatly declining between Varennes and Sorel, due to bacterial contamination of the water coming from treatment plants located upstream from Contrecoeur that are discharged into the river without being disinfected (Hébert, 2013). The water of the St. Lawrence Seaway and north of it are particularly affected. However, the water quality south of the seaway is good or satisfactory, which was also true around the archipelago in the summers of 2008 to 2010 (Hébert, 2013). Moreover, new toxic substances such as nonylphenols (surfactants) and antibiotics (SSLMC, 2008) from the municipal waste water have appeared in the St. Lawrence. The actual impact of water quality on the wildlife and aquatic ecosystems adjacent to the NWA is unknown.

### **3.2.4 Accidental Spills**

A great many merchant ships and pleasure craft use the St. Lawrence Seaway every year. Therefore, they come close to the NWA. The town of Contrecoeur has a municipal wharf, an 80-slip marina and a 60-slip nautical park across from the NWA (Marina Québec, 2018), which adds to the already heavy traffic. Also, many ships connected with the industrial and harbour operations sail to Contrecoeur. An accidental spill of hydrocarbons or other chemicals from these boats into the water washing the archipelago could have serious impacts on the aquatic species, their habitats and the ecosystems of the NWA. The closeness of the industrial and port facilities of the Montreal area exposes this protected area to a spill of this kind. Toxic substances spilled upstream in the St. Lawrence could quickly reach the NWA, given the speed of the current and the narrowness and shape of this alluvial section, which would leave little time for an emergency intervention.

## **3.3 INVASIVE OR OTHERWISE PROBLEMATIC SPECIES, DISEASES AND GENES**

### **3.3.1 Invasive Plants and Problematic Animals**

Eight potentially invasive plant species were reported on the Contrecoeur archipelago in 2000 and 2001 (CWS, 2003). The flowering rush, the reed canarygrass and the purple loosestrife were the most commonly observed species. The European reed was not very abundant at that time. However, in 2010, this species covered roughly 34 hectares in the archipelago (Tougas-Tellier et al., 2013). In fact, recent on-site observations show that this exotic species now forms a number of large colonies on various islands of the NWA

(B. Roberge, CWS, pers. obs., 2016). In the grass beds around the islands, one exotic plant, the Eurasian water milfoil, is also present (CWS, 2003). Some of these species, including the European reed, are very invasive and can bring about changes in habitat biodiversity. For example, on Île Saint-Ours, European reed colonies threaten to wipe out some plant species in precarious status such as the old switch panicgrass (B. Roberge, CWS, pers. comm., 2016).

Also, in the waters adjacent to the NWA, the presence of exotic fish such as the round goby can alter the indigenous fish communities. Exotic invertebrates, including zebra and quagga mussels and the American crayfish, can also alter the ecosystems and supersede the indigenous species.

Moreover, terrestrial predators like the red fox, the striped skunk and the raccoon can occasionally reach the NWA islands. These mammals can reduce the waterfowl populations by preying on the eggs and nestlings. Studies conducted on the Contrecoeur archipelago showed that predator control was able to increase waterfowl nesting success (Giroux et al., 1992; Giroux et al., 1995). That measure has already been used to limit the impacts of these animals on waterfowl broods in the NWA (SDLA and Turgeon, 1998; SDLA, 2009).

### **3.3.2 *Canada Goose, Population of the Temperate Regions***

Groups of Canada geese are regularly seen in the islands of the NWA. This species is increasingly present in the region during the summer. They can be resident individuals, which are copious in the Îles de Verchères, near Contrecoeur (Giroux et al., 2001; CZS, 2003). Those individuals, which belong to the temperate regions population, nest in the NWA (P. Brousseau and J. Rodrigue, CWS, pers. comm., 2015; Giroux et al., 2001). They look for the herbaceous meadows located near the water and sheltered from predators. This species can impact the environment, including through grazing, which fosters shoreline erosion, and through its droppings, which cause cleanliness issues (Environment Canada, 2005b). Those impacts are probably low in the NWA, but should be monitored. Moreover, the Canada goose can use the same resting and nesting habitats as certain waterbird species and other waterfowl species.

## **3.4 HUMAN PRESENCE AND DISTURBANCE**

Human-induced disruptions, such as those caused by picnickers, campers and recreational boaters going ashore on the NWA's islands and from powerboat traffic in the adjacent waters, are sources of stress for the NWA (CWS, 2003). In fact, visitors accessing this protected area, despite the regulation prohibiting access to it, may leave their garbage on the islands, trample the vegetation, alter the environment through their fire and campsite remnants and disturb the breeding birds or species at risk or with a precarious status like the bank

swallow (Nature Québec, 2014). Those visitors can also trample nests, disturb broods, create access paths for predators and impact waterfowl reproduction success. The risks of disrupting the breeding birds, primarily waterfowl, are particularly high in the spring and early summer (mid-May to mid-July) during nesting, the period when there is an influx of recreational boaters around the islands.

Heavy traffic from recreational boats (rowboats, kayaks, personal watercraft, sailboats) and transport vessels on the waters adjacent to the NWA is also a source of disruption for the bird broods. A pilot experiment with inter-shore shuttles between Lavaltrie and Contrecœur and cruises in inflatable craft in the channels around the islands was conducted in 2013 and 2014. It was not extended into 2015, but activities of this sort could be a source of disruption for birds and impact the aquatic ecosystems, even though they also help raise the public's awareness about the importance of the NWA and resource protection.

Motorized traffic on the waters adjacent to the islands is also a threat to the aquatic ecosystems around the NWA. For example, the presence of boats can result in gasoline or traces of gasoline being discharged into the water. The movement of boats in shallow areas also causes the contaminated sediments to be stirred up and resuspended. Also, pleasure boating can contribute to shoreline erosion as well as exotic and invasive species transportation, disturb ducklings, and destroy grass beds, which provide important habitats to various animals, including the copper redhorse, an at-risk fish species.

### **3.5 NATURAL SYSTEM MODIFICATIONS**

#### **3.5.1 *Dams and Water Management or Use***

Management of the St. Lawrence water levels is a sizeable problem for Îles de Contrecœur National Wildlife Area because the wet meadows and aquatic grass beds are environments likely to be the most affected by the expected water-level drop connected with the Great Lakes water level control and with climate change (CWS, 2003; Roy and Boyer, 2011). That water-level drop could bring about an evolution of these environments towards shrub or tree strata, which are less favourable for open-country species (Jean and Létourneau, 2011). Also, a sudden rise in the water level during the waterfowl and waterbird nesting period can jeopardize the reproduction success of those species (CWS, 2003).

### **3.6 CLIMATE CHANGE AND EXTREME WEATHER EVENTS**

Climate change has been identified as a stress factor that can impact Îles de Contrecœur NWA (CWS, 2003). It can bring about changes in the NWA's ecosystems. Increased water evaporation and decreased water inflow caused the water level in the Great

Lakes and the St. Lawrence River to drop between 1990 and 2001. The low water levels reported in the summers of 1995, 1999 and 2001 significantly impacted Lake Saint-Pierre, including the dynamics of the wetlands and the size of the aquatic habitats (SSLMC, 2008). The expected water level reductions in the Montreal and Sorel areas combined with climate-change scenarios could substantially alter the vegetation structure of the Contrecoeur archipelago (CWS, 2003). However, since climate change is a large-scale threat that is external to the NWA, its impact is difficult to assess, and the response capability remains limited.

### **3.7 RESIDENTIAL AND COMMERCIAL DEVELOPMENT**

The Contrecoeur region, neighbouring on Montreal, is exposed to tremendous pressure from residential and commercial development. In fact, the population of Contrecoeur went from 1,435 residents in 1951 to 5,678 residents in 2006, a 264% increase (Ville de Contrecoeur, 2012), and passed the 6,000-residents mark in 2015. Also, the development of 1,500 new dwellings is expected over the next 10 years (Ville de Contrecoeur, 2015). Occupation of the territory also results in shoreline artificialization, which is an issue along the St. Lawrence. Moreover, the size of the anthropogenic areas around the NWA increased 15% between 1964 and 1997 (Labrecque and Jobin, 2013). Over the next few years, large industrial, commercial and residential projects are expected, including the expansion of the Contrecoeur port terminal (Port de Montréal, 2016). Some industrial complexes occupy huge areas on the shores of the St. Lawrence and limit the expansion of natural habitats and certain animal species. These large complexes can also impact the aquatic ecosystems. Expansion of the inhabited and industrial areas occurs to the detriment of the natural terrestrial environments (e.g. wildlands, riparian strips, woodlands) used as corridors for animal species that enter or leave the NWA. All the anthropogenic structures between Highway 132 and Highway 30 further isolate this insular protected area.

### **3.8 SCIENTIFIC KNOWLEDGE GAPS**

Current knowledge on the NWA's ecosystems is sometimes insufficient or obsolete, including about the current use of this protected area by waterfowl species during nesting and migrating periods, the vegetation and habitats in general, the ecology of the at-risk species and the impact of certain threats on the flora and fauna (e.g. pollution, hunting and poaching, presence of visitors). The available data does not always make it possible to adequately assess the NWA's ecological health or fully support decision-making for managing the habitats and wildlife.



## 4 GOALS AND OBJECTIVES

### 4.1 VISION

Îles de Contrecœur National Wildlife Area protects important habitats for species at risk, priority bird species and other wildlife species. Priority bird species are those identified in the *Bird Conservation Strategy for Bird Conservation Region 13 in Quebec Region: Lower Great Lakes/St. Lawrence Plain* (Environment Canada, 2013).

### 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. These goals and objectives will be achieved through the actions set out in Table 5 (Management Approaches for Îles de Contrecœur National Wildlife Area), which will be implemented based on 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 habitats of the NWA's priority birds, including waterfowl populations.
- 1.2 Maintain the populations of species at risk or with a precarious status and their habitats.
- 1.3 Reduce the impacts of shoreline erosion caused by wave action from passing boats on the NWA's habitats.
- 1.4 Limit the impacts of invasive species and, as needed, predators in the NWA.
- 1.5 Limit the impacts of changes in the ecosystems.

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

Objectives:

- 2.1 Post adequate signage about the NWA boundaries to protect the fauna and flora from the impact of human activities (e.g. disturbance from recreational boaters, swimming, fishing).
- 2.2 Promote awareness among the regional population and the public about the NWA's mission and applicable regulations in order to reduce the number of incidents related to regulatory non-compliance.
- 2.3 Document and, if possible, limit the impact of pollution on the NWA's habitats and species.

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

Objectives:

- 3.1 Incorporate into the NWA adjacent lands that have ecological value.
- 3.2 Encourage the protecting of the lands adjacent to the NWA that are important for conservation.
- 3.3 Inform the managers of the adjacent lands about the concerns pertaining to the use of resources near the NWA.

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

Objectives:

- 4.1 Implement an ecological monitoring plan.
- 4.2 Determine the gaps in scientific knowledge and fill those that are deemed a priority.

**Goal 5:** Promote awareness among the public and regional communities 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, the role of the NWA and the mission of Environment and Climate Change Canada's Canadian Wildlife Service.
- 5.2 Promote local community awareness of and involvement in the conservation of the NWA and adjacent lands.

#### **4.3 EVALUATION**

An annual review of the actions implemented and the results achieved will be conducted based on the availability of financial and human resources. That review will help identify future priorities for actions and resource investment. The management plan itself will be re-evaluated five years after it is initially approved and will be reviewed and updated every ten years thereafter.

**Table 5: Management Approaches for the Îles de Contrecoeur National Wildlife Area**

Goals	Objectives	Actions (Priority Level) <sup>1</sup>
<p><b>Goal 1: Protect and enhance significant habitats for species at risk, priority bird species and other wildlife species.</b></p> <p><b>Threats and challenges:</b></p> <ul style="list-style-type: none"> <li>• Transportation and service corridors</li> <li>• Human presence and disturbance</li> <li>• Invasive or otherwise problematic species, diseases and genes</li> <li>• Natural system modifications</li> </ul>	<p><b>Objective 1.1:</b> Protect the habitats of the NWA's priority birds, including waterfowl populations.</p>	<ul style="list-style-type: none"> <li>• Conduct regular surveys (e.g. every 5 years) of waterfowl species and other priority bird species so as to determine their population status and their use of the NWA (e.g. reproduction, migration). <b>(1)</b></li> <li>• Determine the most abundant breeding waterfowl species (e.g. gadwall, Northern pintail, mallard) and other waterfowl and priority bird species. <b>(1)</b></li> <li>• Determine how the waterbirds use the NWA by conducting appropriate surveys and studies. <b>(2)</b></li> <li>• Establish specific conservation measures for those species and their habitats in the NWA. <b>(1)</b></li> </ul>
	<p><b>Objective 1.2:</b> Maintain the populations of species at risk or with a precarious status and their habitats.</p>	<ul style="list-style-type: none"> <li>• Determine how the NWA is used by at-risk species such as the sedge wren and the bank swallow as well as the copper redhorse, whose identified critical habitat may include the grass beds around the NWA. <b>(1)</b></li> <li>• Following the gazetting of the critical habitat of species at risk, develop and implement critical habitat protection measures. <b>(2)</b></li> <li>• Implement the recommendations from all recovery documents for the species at risk in the NWA in keeping with the agreed-upon schedules. <b>(3)</b></li> </ul>
	<p><b>Objective 1.3:</b> Reduce the impacts of shoreline erosion caused by wave action from passing boats on the NWA's habitats.</p>	<ul style="list-style-type: none"> <li>• Determine the current status of the shoreline erosion of the NWA's islands and the impacts of erosion on habitats, and establish priority interventions. <b>(2)</b></li> <li>• Establish an island erosion monitoring system. <b>(2)</b></li> <li>• Carry out the priority work for restoring the shorelines and wildlife habitats in collaboration with the stakeholders concerned, favouring eco-engineering methods. <b>(3)</b></li> </ul>
	<p><b>Objective 1.4:</b> Limit the impacts of invasive species and, as needed, predators in the NWA.</p>	<ul style="list-style-type: none"> <li>• In collaboration with regional conservation groups, assess the extent of the invasion and the impacts of invasive species like the European reed. <b>(1)</b></li> </ul>

**Table 5: Management Approaches for the Îles de Contrecoeur National Wildlife Area**

Goals	Objectives	Actions (Priority Level) <sup>1</sup>
		<ul style="list-style-type: none"> <li>• Set up stations for monitoring and detecting invasive species in the NWA and do regular follow-up. <b>(1)</b></li> <li>• Establish and implement measures for controlling (if possible) the European reed colonies. <b>(2)</b></li> <li>• Determine the need for controlling predators (including the red fox, the raccoon and the striped skunk) to limit reduction in the populations of breeding ducks, in keeping with the existing predator management policy. <b>(1)</b></li> </ul>
	<p><b>Objective 1.5:</b> Limit the impacts of changes in the ecosystems.</p>	<ul style="list-style-type: none"> <li>• Examine the impact of water level management on erosion of the NWA's islands and habitats and on nesting. <b>(1)</b></li> <li>• Determine the potential impacts of the resident Canada geese in the NWA. <b>(3)</b></li> </ul>
<p><b>Goal 2: Reduce the impact of human activities on the NWA.</b></p> <p><b>Threats and challenges:</b></p> <ul style="list-style-type: none"> <li>• Human presence and disturbances</li> <li>• Pollution</li> </ul>	<p><b>Objective 2.1:</b> Post adequate signage about the NWA boundaries to protect the fauna and flora from the impact of human activities (e.g. disturbance from recreational boaters, swimming, fishing).</p>	<ul style="list-style-type: none"> <li>• Install complete signage in the NWA and finish marking out the NWA's boundaries. <b>(1)</b></li> </ul>
	<p><b>Objective 2.2:</b> Promote awareness among the regional population and the public about the NWA's mission and applicable regulations in order to reduce the number of incidents related to regulatory non-compliance.</p>	<ul style="list-style-type: none"> <li>• Post notices displaying the NWA's regulations outside its boundaries (marinas, boat launches). <b>(1)</b></li> <li>• Publish public notices in newspapers (once every three years) about the NWA's regulations and disseminate general information about the NWA (in newspapers, magazines, brochures, etc.). <b>(1)</b></li> <li>• Work with the Wildlife Enforcement Directorate to promote monitoring of the area and enforcement of the legislation. <b>(1)</b></li> <li>• Disseminate information about the importance of the NWA among regional organizations, local communities and the public in collaboration with various stakeholders. <b>(3)</b></li> </ul>

**Table 5: Management Approaches for the Îles de Contrecoeur National Wildlife Area**

Goals	Objectives	Actions (Priority Level) <sup>1</sup>
	<p><b>Objective 2.3:</b> Document and, if possible, limit the impacts of pollution on the NWA's habitats and species.</p>	<ul style="list-style-type: none"> <li>• Map the NWA's sensitive habitats and be involved in implementing the emergency response plan (ERP) of ECCC's CWS to protect the vulnerable wildlife species and habitats in case of accidental spills. <b>(1)</b></li> <li>• Document the potential impacts of industrial and domestic effluents as well as contaminated sediments on the NWA's habitats and species. <b>(1)</b></li> </ul>
<p><b>Goal 3: Consolidate the NWA's land holdings and promote natural habitat conservation on adjacent lands in order to foster connectivity and improve ecological conditions.</b></p> <p><b>Threats and challenges:</b></p> <ul style="list-style-type: none"> <li>• Residential and commercial development</li> </ul>	<p><b>Objective 3.1:</b> Incorporate into the NWA adjacent lands that have ecological value.</p>	<ul style="list-style-type: none"> <li>• If possible, renew the agreement with the company ArcelorMittal to protect the waterfowl nesting habitats. <b>(1)</b></li> <li>• Determine whether federally or privately owned lands could be incorporated into the NWA and, if yes, take the necessary steps to incorporate those lands into the NWA. <b>(3)</b></li> </ul>
	<p><b>Objective 3.2:</b> Encourage the protecting of lands adjacent to the NWA that are important for conservation.</p>	<ul style="list-style-type: none"> <li>• Conduct an analysis of the ecological value and conservation potential of the islands and parts of islands adjacent to the NWA. <b>(2)</b></li> <li>• Work with players in the community: Town of Contrecoeur, RCM of Marguerite-d'Youville, RCM of D'Autray and conservation organizations to maintain buffer zones around the NWA. <b>(3)</b></li> <li>• Raise the awareness of the owners of lands adjacent to the NWA about the importance of protecting the natural environments. <b>(3)</b></li> </ul>
	<p><b>Objective 3.3:</b> Inform the managers of adjacent lands about the concerns pertaining to the use of resources near the NWA.</p>	<ul style="list-style-type: none"> <li>• As needed, get involved in regional issue tables dealing with the NWA's various threats and management challenges. <b>(3)</b></li> </ul>
<p><b>Goal 4: Ensure ecological monitoring of the NWA and improve knowledge on wildlife species and their habitats.</b></p> <p><b>Threats and challenges:</b></p> <ul style="list-style-type: none"> <li>• Scientific knowledge gaps</li> </ul>	<p><b>Objective 4.1:</b> Implement an ecological monitoring plan.</p>	<ul style="list-style-type: none"> <li>• Identify the indicators and follow-up methodologies of an ecological monitoring plan. <b>(1)</b></li> <li>• Use the expertise of the Abenakis, local conservation organizations and ministries for implementing and analyzing the NWA ecological health monitoring work. <b>(2)</b></li> <li>• Implement the ecological monitoring plan. <b>(1)</b></li> </ul>

**Table 5: Management Approaches for the Îles de Contrecoeur National Wildlife Area**

Goals	Objectives	Actions (Priority Level) <sup>1</sup>
<ul style="list-style-type: none"> <li>• Human presence and disturbance</li> </ul>	<p><b>Objective 4.2:</b> Determine the gaps in scientific knowledge and fill those that are deemed a priority.</p>	<ul style="list-style-type: none"> <li>• Determine the gaps to be filled and update the knowledge acquisition plan on the basis of the NWA's conservation plan prepared in 2003 and the most recent plant and animal surveys. <b>(2)</b></li> <li>• Use traditional ecological knowledge in managing the NWA's ecosystems. <b>(2)</b></li> <li>• Set research priorities and convey them to universities and research centres to encourage scientific work in the NWA. <b>(2)</b></li> <li>• Use the various existing sources of data (ÉPOQ, eBird, SOS-POP, NGOs, ornithological clubs, research work) to improve scientific knowledge about the NWA. <b>(3)</b></li> <li>• Encourage the conducting (internally or by contributors such as Aboriginals and conservation groups) of surveys or monitoring of priority bird species, species at risk or with a precarious status, sensitive habitats, stresses and threats based on the knowledge acquisition plan. <b>(1, 2, 3)</b></li> </ul>
<p><b>Goal 5: Promote awareness among the public and regional communities about the conservation of the NWA, wildlife species and their habitats.</b></p> <p><b>Threats and challenges:</b></p> <ul style="list-style-type: none"> <li>• Residential and commercial development</li> <li>• Human presence and disturbance</li> <li>• Pollution</li> </ul>	<p><b>Objective 5.1:</b> Encourage public and regional community outreach and communication activities on the importance of conservation, the role of the NWA and the mission of Environment and Climate Change Canada's Canadian Wildlife Service.</p> <p><b>Objective 5.2:</b> Promote local community awareness of and involvement in the conservation of the NWA and adjacent lands.</p>	<ul style="list-style-type: none"> <li>• Collaborate with local organizations in various activities such as developing an awareness program for the NWA. <b>(2)</b></li> <li>• Encourage the preparation of informational and awareness-raising tools about the NWA (e.g. brochure, web page, social media). <b>(3)</b></li> <li>• Encourage the conservation outreach and education projects of local communities (e.g. those of the local conservation groups and Abenakis communities) for the NWA and the surrounding area. <b>(3)</b></li> <li>• Support regional conservation initiatives (e.g. projects on species at risk, stewardship projects) in the NWA and surrounding lands and maintenance of buffer zones. <b>(3)</b></li> </ul>

<sup>1</sup>. **Implementation timeline:** 1 (from 0 to 3 years), 2 (from 4 to 6 years), 3 (from 7 to 10 years and beyond)

**Note:** The priority levels assigned to the actions refer 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**

This section summarizes the approaches and actions presented in Table 5 and that are likely to be used in managing Îles de Contrecoeur NWA. However, specific management actions will be determined during the annual planning process and will be implemented based on available human and financial resources and in keeping with the approaches described below.

### **5.1 HABITAT MANAGEMENT**

Habitat management will focus on conserving important habitats for waterfowl including the gadwall and the Northern pintail, recovering species at risk and protecting their critical habitat, and protecting important habitats for other wildlife species.

Since the NWA is made up of insular environments minimally isolated from the continent, efforts will be made to mitigate the impacts of erosion on the riparian habitats, restore disrupted habitats, document and, if possible, limit the impacts of pollution around the islands, reduce the spread of invasive plant species where applicable, and mitigate human-induced disruptions. Monitoring of the area will also be favoured for limiting the number of incidents related to regulatory non-compliance in the NWA.

### **5.2 WILDLIFE MANAGEMENT**

Wildlife management will be based on the knowledge acquired through surveys and various studies. That knowledge will make it possible to take stock of a number of the NWA's biodiversity aspects. Monitoring efforts could be carried out to gain a better understanding of and to better manage the waterfowl and waterbird populations that use the NWA. Also, cooperation with various government and university specialists for research or monitoring projects will be favoured to ensure the best possible protection of species at risk. The recommendations provided in species-at-risk recovery programs will guide critical habitat protection in the NWA and surrounding area.

### **5.3 MONITORING**

The implementation of an ecological monitoring program over the next five years is anticipated for assessing the ecological condition of the NWA and gathering information that will be useful in making management decisions. That program will be based on the biological monitorings done internally and in cooperation with regional and provincial collaborators. Ecological monitoring efforts could cover, among other things, habitats, at-risk and priority or representative species of the NWA (e.g. waterfowl) and the ecological and human-induced

stresses that the area is subjected to (e.g. shoreline erosion). Cooperation with local stakeholders could be introduced to increase the effectiveness and longevity of the program.

#### **5.4 RESEARCH**

Knowledge acquisition and research needs have been established for a number of animal and plant species and for the threats and management challenges associated with Îles de Contrecoeur National Wildlife Area. In this regard, the updating of a knowledge acquisition plan based on the current NWA conservation plan and on the surveys and studies conducted since that plan was prepared is being considered. One of the priorities is to better document how the NWA is used by the waterfowl including the gadwall and the northern pintail, waterbirds, colonial birds (the ring-billed gull) and the presence of certain species at risk or with a precarious status, including the sedge wren, the Nelson's sparrow and the bank swallow, as well as plants at risk. It will be very important to gain a better understanding of the extent of the ecological threats that can impact the NWA, including shoreline erosion, the impacts of invasive species, the presence of predators, the potential impacts of water pollution, ecosystem changes and climate change. Lastly, it would also be desirable to acquire knowledge about the insects, benthos and non-vascular plants.

To obtain a permit to conduct research in Îles de Contrecoeur National Wildlife Area and to receive instructions regarding the guidelines for research proposals, please contact:

National Wildlife Area – Permit Request  
Environment and Climate Change Canada, Canadian Wildlife Service  
801-1550 D'Estimauville Avenue  
Québec QC G1J 0C3  
Email: [ec.permisscfquebec-cwsquebecpermit.ec@canada.ca](mailto:ec.permisscfquebec-cwsquebecpermit.ec@canada.ca)

#### **5.5 PUBLIC INFORMATION AND OUTREACH**

Since public access to Îles de Contrecoeur NWA is prohibited except for grass beds (aquatic part of the NWA) for fall hunting of migratory birds, Environment and Climate Change Canada does not authorize outreach activities there. No visitor infrastructure is planned. However, the Department can encourage NWA-related outreach activities from the continent or even aboard watercraft sailing around the islands. Those activities could be carried out by municipalities and conservation organizations, among others, under the authority of a permit.



## **6 AUTHORIZATIONS AND PROHIBITIONS**

In the interest of the wildlife species and their habitats, human activities are minimized and controlled in NWAs under the *Wildlife Area Regulations*. These regulations set out the activities that are prohibited (subsection 3[1]) in NWAs and provide mechanisms for the Minister of Environment and Climate Change to authorize certain activities that are otherwise prohibited. The regulations also provide the authority for the Minister to prohibit entry into NWAs.

Activities within an NWA are authorized only if notices issued by the Minister have been published in a local newspaper or posted at the entrance or limits of the NWA and are subject to the terms of said notice. However, the Minister of Environment and Climate Change can issue a permit authorizing certain activities.

### **6.1 PROHIBITION OF ENTRY**

Under the *Wildlife Area Regulations*, the Minister may issue a notice that will be published in a local newspaper or posted at the entrance of any NWA to or on the boundary of any part thereof prohibiting entry to any NWA or part thereof. Such a notice 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.

Due to the sensitivity of the wildlife species and the insular environments, access to the terrestrial portion of Îles de Contrecoeur National Wildlife Area is prohibited, unless a permit issued by the Minister is obtained. However, access to the grass beds (aquatic part) bordering on the NWA will be permitted from watercraft for fall hunting of migratory birds and sport fishing, in accordance with the regulations in effect.

The notice prohibiting access is published in local newspapers. Notices may also be posted at the main boat departure sites (boat launch, marinas) in the immediate area of the NWA.

### **6.2 AUTHORIZED ACTIVITIES**

Any activity other than the fall hunting of migratory birds and sport fishing around the islands is prohibited in this NWA except under the authority of a permit, including hunting for small or large game animals, snaring, trapping, swimming, fires, picnicking, camping, driving motorized vehicles (e.g. ATVs, motorcycles, snowmobiles), cross-country skiing and snowshoeing.

A permit or authorization could be issued for research activities that align with the priorities set out in the management plan and for activities such as surveys, wildlife enhancement works or habitat restoration.

Since the following activities are consistent with the conservation goals and objectives set out in this management plan, they are permitted in the NWA, but only bordering on the islands and from a watercraft: fall hunting of migratory birds (waterfowl) and sport fishing.

### **6.2.1 Migratory Bird Hunting**

Waterfowl hunting is an activity that has taken place for a number of decades in the Contrecoeur archipelago. Migratory bird hunting is permitted only in submerged grass beds located on the periphery of the NWA (aquatic part) provided that the regulatory requirements respecting time periods, conditions and authorized hunting gear are met. It is not permitted on the terrestrial portion of the NWA's islands. Rudimentary blinds can be temporarily set up at the edge of the islands for hunting, but they must be removed at the end of the hunting period. Clearing and cutting the vegetation on the islands' shorelines is not permitted. Garbage must be picked up.

### **6.2.2 Sport Fishing**

Sport fishing from a watercraft is acceptable at the edges of the islands after July 15, provided that the breeding birds and their broods are not disturbed and that boats operate very slowly and carefully.

**Note:** If there is a discrepancy between the information presented in this document and the public notice, the notice shall prevail as a legal instrument.

## **6.3 AUTHORIZATIONS**

Permits and notices authorizing an activity may be issued only 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 otherwise consistent with the criteria and purpose for which the NWA was established, as set out in the most recent 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 and for protecting them.

For further information, please consult the Environment and Climate Change Canada "Policy when Considering Permitting or Authorizing Prohibited Activities in Protected Areas Designated under the *Canada Wildlife Act* and *Migratory Birds Convention Act, 1994*" (December 2011). This policy document is available on the protected areas website at

<https://www.canada.ca/fr/environnement-changement-climatique/services/reserves-nationales-faune/documents-reference-aires-protégees/politiques-lignes-directrices.html>.

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  
801-1550 D'Estimauville Avenue  
Québec QC G1J 0C3  
Email: [ec.permisscfquebec-cwsquebecpermit.ec@canada.ca](mailto:ec.permisscfquebec-cwsquebecpermit.ec@canada.ca)

#### **6.4 EXCEPTIONS**

The following activities do not require a permit or authorization:

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

#### **6.5 OTHER FEDERAL AND PROVINCIAL AUTHORIZATIONS**

Depending on the type of activity, other federal or provincial authorizations or permits may be required for undertaking an activity in this NWA.

For further information, please contact the regional office of the appropriate federal or provincial authority.

## 7 HEALTH AND SAFETY

All reasonable efforts will be made to protect the health and safety of the public, including adequately informing visitors of any known or anticipated risk or hazard. Furthermore, Environment and Climate Change Canada staff will take all reasonable and necessary precautions for protecting their own health and ensuring their safety and that of their co-workers. However, visitors (including researchers and contractors) must make all reasonable efforts to become informed about the risks and hazards and must be properly prepared and self-sufficient. Since natural areas involve some dangers, visitors must take proper precautions to ensure their own safety. There are no Environment and Climate Change Canada staff permanently on site in this NWA or services for ensuring ongoing visitor safety. Environment and Climate Change Canada plans to implement a public safety plan to limit the risk of incidents and ensure public safety in the NWA.

Emergency incidents or situations can be reported to:

- **Environmental emergency:** ECCC's Canadian Environmental Emergencies Notification System at 514-283-2333 or 1-866-283-2333, or Quebec Department of Environment and the Fight Against Climate Change at 1-866-694-5454
- Regulatory non-compliance and poaching: Enviro-info at 819-938-3860 or 1-800-668-6767
- SOS-Poaching: 1-800-463-2191
- 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
- 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 their regulations:

- the *Migratory Birds 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.

Below are examples of activities that, if carried out in NWAs without authorization, may constitute an offence:

- accessing the site;
- destroying or disturbing migratory birds, their nests or their eggs;
- possessing a weapon or other instrument that could be used for hunting;
- picnicking or carrying on any other recreational activity outside the areas designated to that end;
- camping;
- 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 based on priorities and the budgetary framework. Depending on available resources and opportunities, some actions may be brought forward, postponed or cancelled. Environment and Climate Change Canada will promote an adaptive management approach. The implementation of the plan will be evaluated five years after it is published and on the basis of the actions set out in Table 5.

## 10 COLLABORATORS

Collaboration with local agencies and organizations will be favoured in order to contribute to the protection and conservation of wildlife species and their habitats in Îles de Contrecoeur National Wildlife Area. For instance, collaborations may be established or continued with universities and research centres to fill scientific knowledge gaps, with the province to implement species at risk recovery measures, particularly for those species under provincial jurisdiction, and with non-governmental organizations and municipal authorities to increase public awareness about the NWA's conservation objectives.

The main organizations likely to collaborate in the mission and activities of Îles de Contrecoeur National Wildlife Area are listed below.

CEGEP de Sorel-Tracy  
3000 De Tracy Boulevard  
Sorel-Tracy QC J3R 5B9  
Phone: 450-742-6651  
Fax: 450-742-1878  
Email: [info@cegepst.qc.ca](mailto:info@cegepst.qc.ca)

Centre universitaire de Sorel-Tracy  
(Université du Québec à Trois-Rivières)  
3000 De Tracy Boulevard, Suite A2106  
Sorel-Tracy QC J3R 5B9  
The centre is located on the premises of Cégep de Sorel-Tracy  
Phone: 450-742-1991  
Fax: 450-742-6485  
Email: [horscampus.sorel-tracy@uqtr.ca](mailto:horscampus.sorel-tracy@uqtr.ca)

Club d'ornithologie Sorel-Tracy inc.  
Box 1111  
Sorel-Tracy QC J3P 7L4  
Phone: 450-783-2385 (R. Brunet, director)  
Email: [info@ornitho-soreltracy.org](mailto:info@ornitho-soreltracy.org).

Comité ZIP des Seigneuries  
(Des Seigneuries ZIP Committee)  
1095 Notre-Dame Street  
Box 353  
Saint-Sulpice QC J5W 4L9  
Phone/Fax: 450-713-0887  
Email: [seigneuries@zipseigneuries.com](mailto:seigneuries@zipseigneuries.com)

Conseil des Abénaquis d'Odanak  
104 Sibosis Street  
Odanak QC J0G 1H0  
Phone: 450-564-2810  
Toll free number: 1-888-568-2810  
Fax: 450-568-3553

Conseil des Abénaquis de Wôlinak  
10120 Kolipaïo Street  
Wôlinak QC G0X 1B0  
Phone: 819-294-6696  
Fax: 819-294-6697

Grand Conseil de la Nation Waban-Aki  
10175 Kolipaïo Street  
Wôlinak QC G0X 1B0  
Phone: 819-294-1686  
Fax: 819-294-1689  
Email: [info@gcnwa.com](mailto:info@gcnwa.com)

Municipalité régionale de comté (MRC) de D'Autray  
(Regional County Municipality [RCM] of D'Autray)  
550 De Montcalm Street, Suite 100  
Berthierville QC J0K 1A0  
Phone: 450-836-7007  
Fax: 450-836-1576



Municipalité régionale de comté [MRC] de Marguerite-D'Youville  
(Regional County Municipality (RCM) of Marguerite-D'Youville)  
609 Marie-Victorin Road  
Verchères QC J0L 2R0  
Phone: 450-583-3301; Montreal: 514-856-5701  
Fax: 450-583-3592  
Email: [infomrc@margueritedyouville.ca](mailto:infomrc@margueritedyouville.ca)

Nature Québec (IBA Program)  
870 De Salaberry Avenue, Suite 207  
Québec QC G1R 2T9  
Phone: 418-648-2104  
Fax: 418-648-0991  
Email: [conservons@naturequebec.org](mailto:conservons@naturequebec.org)

Organisme de bassin versant Richelieu–Saint-Laurent  
COVABAR  
806 Chemin Richelieu  
Beloeil QC J3G 4P6  
Phone: 450-446-8030  
Fax: 450-464-8854  
Email: [marcel.comire@covabar.qc.ca](mailto:marcel.comire@covabar.qc.ca) (coordinator)

Ministère de l'Environnement et de la Lutte contre les changements climatiques  
(MELCC) du Québec  
(Quebec Ministry of Environment and Fight against Climate Change)  
Analysis and Regional Expertise Branch and Quebec Environmental Control  
Centre – Regional Offices  
Longueuil  
201 Place Charles-Le Moyne, 2nd Floor  
Longueuil QC J4K 2T5  
Phone: 450-928-7607  
Fax: 450-928-7625  
Email: [monteregie@mddelcc.gouv.qc.ca](mailto:monteregie@mddelcc.gouv.qc.ca)

Repentigny  
100 Industriel Boulevard  
Repentigny QC J6A 4X6  
Phone: 450-654-4355  
Fax: 450-654-6131  
Email: [lanaudiere@mddelcc.gouv.qc.ca](mailto:lanaudiere@mddelcc.gouv.qc.ca)

Parc nautique de Contrecoeur  
5280 Marie-Victorin Road  
Contrecoeur QC J0L 1C0  
Phone: 450-587-5495

Université du Québec à Montréal (UQAM)  
Suite J-M320 (Judith-Jasmin building)  
405 Sainte-Catherine Street East  
Montreal QC H2L 2C4  
Phone: 514-987-3000  
Email: [general@uqam.ca](mailto:general@uqam.ca)

Ville de Contrecoeur  
5000 Marie-Victorin Road  
Contrecoeur QC J0L 1C0  
François Handfield, Chief Administrative Officer  
Phone: 450-587-5901 ext. 239  
Email: [handfieldf@ville.contrecoeur.qc.ca](mailto:handfieldf@ville.contrecoeur.qc.ca)

Ville de Lavaltrie  
1370 Notre-Dame Street  
Lavaltrie QC J5T 1M5  
Phone: 450-586-2921  
Fax: 450-586-3939  
Email: [mairie@ville.lavaltrie.qc.ca](mailto:mairie@ville.lavaltrie.qc.ca)

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