



Bird Surveys (Spring 2019) Prior to Wildlife Habitat Restoration in the Lake Saint-Pierre Shoreline

Segment 2, Saint-Barthélemy

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Inventaires d'oiseaux (printemps 2019) préalables à la restauration d'un aménagement faunique dans le littoral du lac Saint-Pierre – Segment 2, Saint-Barthélemy.

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1. Introduction

Lake Saint-Pierre and its floodplain, which is the most extensive in Quebec, are a key component of the St. Lawrence ecosystem. With more than 288 resident and migratory bird species and 79 fish species (MDDEFP, 2013), the lake offers an exceptional natural environment, which has received international recognition for its rich biodiversity (UNESCO Biosphere Reserve and RAMSAR site).

Agricultural activities have been carried out on the fertile floodplain of Lake Saint-Pierre for several centuries. Beginning in the second half of the 20th century, perennial crops were gradually replaced by annual crops, even in the lake's floodplain (Dauphin and Jobin, 2016). Agricultural practices associated with annual crops have resulted in the degradation of natural habitats and reduced the amount of habitat available for many wildlife species (Latendresse et al., 2008; Rioux et al., 2009). Grassland birds (Bobolink, Eastern Meadowlark, etc.), whose populations are in decline (NABCI, 2019), and waterfowl are among the species that have been adversely affected by the disappearance of wet meadows and the conversion of perennial crops to annual crops. The loss of plant substrates caused by fall tillage creates soil erosion during high water periods and results in the destruction of key spawning and rearing grounds used by fish in the spring. This degradation has played a key role in the decline of the yellow perch population in Lake Saint-Pierre (Magnan et al., 2017). To date, roughly 5,000 hectares of potential yellow perch spawning habitat have been lost (TCRLSP, 2017).

With the aim of balancing agricultural activities and wildlife protection, an approach has been developed for restoring wildlife habitats near the shoreline of Lake Saint-Pierre (Groupe de travail « Intendance en milieu agricole : culture du littoral au lac Saint-Pierre », 2010). This approach involves stream maintenance (bank reshaping, planting, etc.) and conversion of annual crops back into perennial crops or natural grasslands. To this end, various restoration works have been underway since 2017 in the Berthierville and Saint-Barthélemy areas to help restore the ecological functions of Lake Saint-Pierre.

Bird surveys were conducted in 2012, 2017 and 2018 in order to obtain a picture of the bird communities present along seven watercourses and in three wildlife management areas in the Baie-du-Febvre, Berthierville and Saint-Barthélemy areas (Jobin, 2015; Nicole and Dauphin, 2018a, 2018b, 2019a and 2019b). In 2019, prior to restoration, a survey was conducted to assess the use of Segment 2 (in Saint-Barthélemy on the north shore of the St. Lawrence) by migrating geese and waterfowl. The surveys provide baseline data that can be used to evaluate the potential benefits of the habitat restoration activities for the birds.

This approach is part of the project to restore the Lake Saint-Pierre shoreline, which is being carried out jointly by the Canadian Wildlife Service (CWS) of Environment and Climate Change Canada (ECCC) and the Quebec Department of Forests, Wildlife and Parks (MFFP), as part of the 2016–2021 programming for the St. Lawrence Action Plan (SLAP) (<http://planstlaurent.qc.ca/en/biodiversity.html>).

2. Methodology

2.1 Location and description of bird survey site

The pre-restoration bird surveys were carried out in the northwestern part of the Lake Saint-Pierre floodplain, specifically in a wildlife habitat management site (Segment 2) located in the municipality of Saint-Barthélemy, in the D'Autray regional county municipality (RCM). See **Figure 1** for the location of this site.

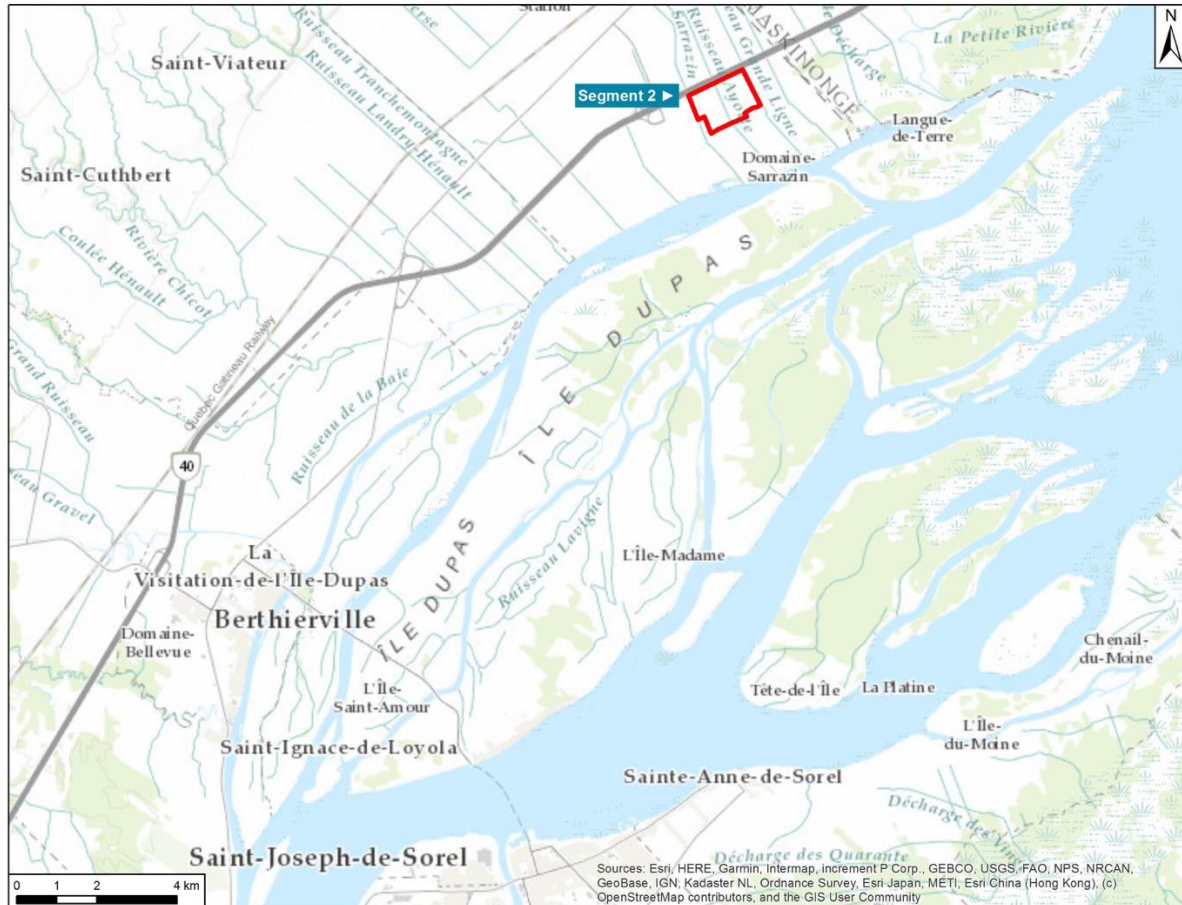


Figure 1. Location of Segment 2

2.1.1 Segment 2

Segment 2, a wildlife habitat management site belonging to Ducks Unlimited Canada (DUC), is part of a large wetland complex known as the Saint-Barthélemy staging area, which covers a total of 64.5 ha. Except for seeded dikes, the area was completely covered by annual crops in 2014 (**Figure 2**). In 2017, DUC bought back the agricultural leases in the area, and farming activities ceased. Restoration of the site began in summer 2019 with the establishment of 10 ha of permanent vegetative cover (mix of wet meadow species). In winter 2019–2020, DUC is planning to carry out the following work: dismantling of the pump station, dismantling and rebuilding of the dewatering structure, construction of openings in the dike and reshaping of ditches.

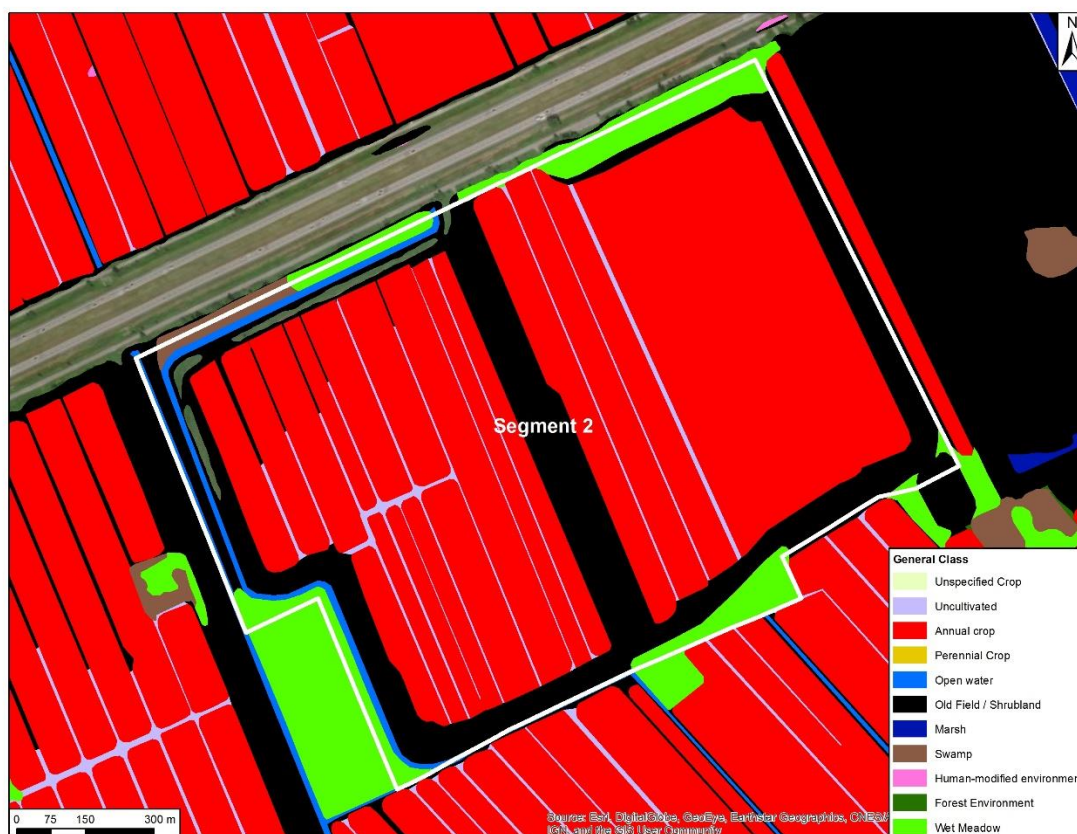


Figure 2. Land use (2014) in Segment 2
(Source: ECCC and MDDELCC, 2018)



Oblique view of Segment 2 (pool in the centre left) – photo by Ducks Unlimited Canada

2.2 Bird survey methods

2.2.1 Segment 2

The objective of the surveys conducted in Segment 2 was to take a complete count of Anatidae (ducks and geese) using the site during the spring migration period, i.e. between the last week of March and the third week of May.

During this period, visits were made every three or four days (twice a week). For the Greater Snow Goose count, the observer arrived at the site at least 30 minutes before sunrise in order to begin the survey at first light, since the geese sometimes leave their resting area very early to feed in the dewatered fields. The survey of ducks and Canada Geese (species and number of individuals) was carried out after the Greater Snow Goose survey. The counts were taken from locations on higher ground, i.e. the dike surrounding the managed area and the observation boardwalk located northeast of the dike. For the major groups of Anatidae, and geese in particular, three successive counts were performed, and the average of these three counts was chosen as the final result. For each visit, the date, the count start and end times and the weather conditions were recorded.

The counts were carried out by a single observer between April 1 and May 19, 2019 in variable but generally good conditions: temperature between -9 °C and 12 °C, clear to overcast skies, little to no rainfall, light to no wind.

A breeding bird survey using the point count survey method was planned to occur in Segment 2 but was later cancelled owing to high water levels in Segment 2, which lasted until the end of June.

3. Results and discussion

3.1 Segment 2

Segment 2 was visited 14 times between April 1 and May 19, 2019. The counts were carried out between 4:45 and 9:30 a.m.

The site was partially or completely covered in snow until April 16, when spring flooding began. Beginning on April 21, the entire area (including the dikes) was covered with water. Since these flood conditions persisted until the end of the spring surveys, lasting even into June, the breeding bird surveys at this site were cancelled.



Segment 2 (indicated by the arrow) in spring 2019 – photo taken on May 5, 2019 by Francis St-Pierre, Canadian Wildlife Service

In total, 12 species of Anatidae were observed in Segment 2 during spring migration, specifically the Canada Goose and 11 species of ducks. **Table 1** presents the maximum number of individuals counted for each species observed. After the Canada Goose, the most abundant species were the Northern Pintail, the Ring-necked Duck and the Mallard. For the other eight species, the maximum number of individuals counted was four or less.

Table 1. Species of Anatidae that used Segment 2 during spring migration, maximum number surveyed and date on which this number was observed

Species	Maximum number	Date of observation
Canada Goose	384	14 april
Wood Duck	4	21 april
Gadwall	4	1 may
Mallard	10	18 april
Black Duck	2	18 april and 1 may
Northern Pintail	46	14 april
Northern Shoveler	2	1 and 7 may
Ring-necked Duck	36	21 april
Greater Scaup	2	21 april
Hooded Merganser	4	21 april
Bufflehead	2	21 april
Green-winged Teal	1	21 april

The maximum number of Canada Geese was reached on April 14, with 384 individuals observed (**Figure 3**). The maximum number of ducks recorded (all species combined) was 97 on April 21.

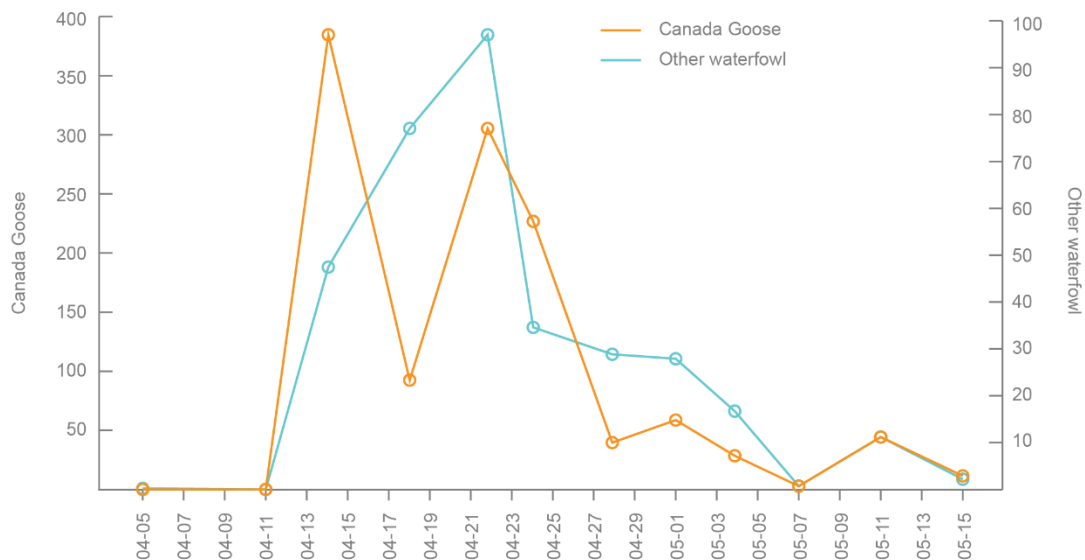


Figure 3. Total number of individuals of Canada Geese (orange curve) and waterfowl (blue curve) observed by date between April 5 and May 15, 2019

No Greater Snow Goose was seen in Segment 2 during the spring 2019 surveys, although flocks were seen passing over the site a number of times. Greater Snow Geese were present in the flooded agricultural fields between Autoroute 40 and Route 138—including a flock of about 25,000 individuals on April 22—but they generally occurred in low numbers in the area.

Given the magnitude of the spring flooding, it is possible that the Greater Snow Geese dispersed farther over the land during the migratory period and that they had to move farther inland to find food. The same appears to be true for ducks and Canada Geese, whose numbers were very low in Segment 2 in 2019. The maximum number of Anatidae (432) was counted on a visit when snowmelt water covered only 1% of the site, a few days before flooding began. The lack of flooded fields in the region at the time very likely forced waterbirds to gather in suitable areas including Segment 2. After flooding began, there was a substantial increase in the number of favourable habitats for waterfowl because most of the fields were covered by water. As a result, Segment 2 (where meltwater was held by the dikes) lost its appeal.

Furthermore, because the land was not cultivated in summer 2018 and because permanent vegetation was not fully established, the quantity of food available in Segment 2 may have been reduced.

The Canada Goose and the Ring-necked Duck were the only species that visited the managed area regularly during the survey period. In fact, these two species were recorded on all visits from the first time that they were detected (with the exception of one visit in the case of the Ring-necked Duck).

In addition to Anatidae, birds of prey were sighted in the area on nine out of 14 visits. In total, eight species were observed: Osprey, Northern Harrier, Red-tailed Hawk, Rough-legged Hawk, Merlin, Peregrine Falcon, Snowy Owl and Bald Eagle.

Conclusion

The migratory bird survey of Segment 2 was carried out under good weather conditions during April and May 2019. No Greater Snow Goose was observed but 384 Canada Geese and 46 Northern Pintails were counted. The wider dispersion of Anatidae across the Lake Saint-Pierre region, promoted by the significant spring flooding of 2019, may partly explain the absence of Greater Snow Geese and the low numbers of Anatidae recorded in the managed area.

Two species listed as threatened or vulnerable in Québec were observed in the managed area, i.e. the Peregrine Falcon (vulnerable) and the Bald Eagle (vulnerable).

Given that restoration of the site began in 2019 and will continue for a number of years to come, it will be interesting to see what effect restoration activities will have in terms of helping to maintain a high-quality resting and feeding area for waterfowl during the migratory period. Since breeding bird surveys (passerines and others) could not be carried out because of the high water levels, a new survey campaign needs to be planned to assess the response of this group to the restoration activities.

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