



The Shediac Bay Watershed Association Inc.

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Report produced for the New Brunswick Environmental Trust Fund Contributors:

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Acknowledgements

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1 Introduction

The Shediac Bay Watershed Association (SBWA) was founded in 1999 as a result of growing concerns from local community residents over the ecological health of Shediac Bay. In order to establish a long-term water quality-monitoring program, a community-based association was formed. To address growing concerns on water quality in the



Shediac Bay, the program "Evaluating the Health of the Shediac Bay" was initiated in 2016. The program aims to assess the health of coastal habitats and ecosystems, conduct ecological restoration initiatives, and launch education and awareness campaigns.

The eelgrass monitoring program began in 2016, to assess the state of the eelgrass habitats in the Shediac Bay, as they are facing the threats from the invasive green crab. Additionally, we've been able to use this data to assess the impacts of severe storms on these sensitive ecosystems. These transects are monitored once per year using the SeagrassNet protocol, to measure changes in density of the eelgrass beds over time. Monitoring of the invasive European Green Crab continued in conjunction with the eelgrass monitoring.

Smelt spawning surveys were undertaken for the first time in 2021. With matching funds from the U de M (from the New Brunswick Wildlife Trust Fund), and guidance and training from the Department of Fisheries and Oceans, watercourses have been evaluated from the Cocagne River to Baie Verte over the last 2 years.

Coastal restoration has been an area of great interest, and the SBWA has worked to increase its capacity for ecological restoration around sand dunes and in habitats along the coastline.

Public education and outreach activities are an integral part of all SBWA projects. A partnership with the Shediac Bay Yacht club has produced a boater awareness campaign, aiming to promote best environmental practices for boaters and the promotion of pumping station locations in Southeast NB. The Shediac Bay Yacht Club and Parlee Beach Provincial Park both received a Blue Flag certification in 2019. As a partner in this program, the SBWA helps deliver educational materials and resources.

The SBWA continues to develop public educational materials such as signage, interpretation panels, videos, handouts and social media postings. The Association has expanded its digital outreach on several social media platforms. The present report highlights the monitoring results and actions that have been undertaken in 2022.

1.1 Overview of the Shediac Bay Watershed

The Shediac Bay Watershed covers 420 km² of land area and stretches along 36 km of coastline, from Cap Bimet to Cap-de-Cocagne (Figure 1). The Shediac Bay Watershed is composed of two major river systems emptying into Shediac Bay: the Shediac River and the Scoudouc River. The Shediac and the Scoudouc Rivers are characterized by small tributaries covering watersheds of 201 km² and 143 km², respectively. The Shediac River is composed of two major water arms. The northern water arm is created by the convergence of the McQuade Brook, the Weisner and the Calhoun Brook. The southern water arm of the Shediac River is the continuation of the Batemans Brook.



Figure 1: Map of Shediac Bay watershed boundaries

2 Eelgrass Monitoring

Eelgrass (*Zostera marina*) is an important component in the ecosystem of the Shediac Bay. It is a marine plant that can grow up to two metres in deep waters. The leaves are supported by a rhizome (underground stem) on the seabed. It serves as shelter and food for a wide variety of fishes, crustaceans and shellfish. In addition, this marine plant helps filter the water column and stabilize sediment, thereby creating a buffer zone between land and water.

The *SeagrassNet* program is a global seagrass monitoring network that monitors the status of seagrass and the threats to these ecosystems. The program started in 2001, and now includes more than 126 sites in 33 countries. In 2015, the Southern Gulf of Saint Lawrence Coalition on Sustainability (Coalition-SGSL) implemented the SeagrassNet program in Atlantic Canada. In 2016, they provided equipment and training to the SBWA for the monitoring program to begin in the Shediac Bay. Since the dissolution of the Coalition-SGSL, the Ecology Action Centre in Halifax has taken the role of coordinating the eelgrass monitoring consortium for New Brunswick.

In fall 2019, hurricane Dorian caused extensive damages to the eelgrass beds. The eelgrass monitoring data, prior to the storm, will serve as a tool in monitoring of the recovery rate of the eelgrass beds. Continuing the monitoring of these habitats in 2023 will reveal the extent of the damages caused by hurricane Fiona in September 2022.

In addition, the invasive European green crab (*Carcinus maenas*) has been present in the Shediac Bay since 2010. The green crab is an invasive species originating from Europe and is capable of devastating our local eelgrass habitats (Therriault, Herborg, Locke, & McKindsey, 2008). The data collected from these annual surveys will serve to measure changes in eelgrass density and measure the ecological impacts of the green crab.

2.1 Eelgrass Scientific Consortium

The eelgrass scientific consortium is a group that is coordinated by the Southern Gulf of Saint-Lawrence Coalition, who meets to discuss the state of eelgrass habitats in the maritime provinces. The SGSL-Coalition also went through a transition in 2021; the departure of the executive director and the lack of a replacement has caused the dissolution of the Coalition.

Thankfully, the remaining assets and legacy projects have been transferred to the Ecology Action Centre (EAC) in Halifax. The EAC has taken the lead on the coordination of the eelgrass monitoring and scientific consortium for the NB organizations.

Although no official meeting was held in 2022, due to staff turnover at the EAC, the groups met on several occasions to prepare a multi-year funding proposal (2022-2024) that was submitted to

the DFO- Ocean Management Fund. The funding was approved in 2022 and will supplement the costs of the eelgrass and green crab monitoring projects in the Shediac Bay. This project will also support Blue Carbon sampling, to measure the capacity for carbon storage in eelgrass beds at multiple sites in New Brunswick and Nova Scotia.

2.2 Methods

At each assessment site, a line crossing the eelgrass bed is drawn perpendicular to the shoreline. Three transects, parallel to the shoreline, are then determined using the following criteria:

- Transect A: Shallow station (1m into the eelgrass bed from the landward edge with continuous presence of eelgrass)
- Transect B: Mid-depth station (between deep and shallow stations or at an interesting transition between species)
- Transect C: Deep station (1m into the eelgrass bed before the end of a continuous eelgrass presence)

All transects are marked with three permanent screw anchors. The anchors are placed at the distance of 0m, 25m and 50m. GPS coordinates are taken for each anchor.

During the eelgrass assessment, $12 \text{ }1\text{m}^2$ quadrants are measured on each transect. Quadrant locations are determined in advance by the SeagrassNet program. Fifty metres tapes are prepared in advance with the quadrants identified. The tapes are attached to the anchors at the established distances. The quadrants are then positioned on the tape at the identified distances.

A photo of each quadrant is taken and sent to SeagrassNet. Herbarium sheets of each seagrass species are prepared for the International Seagrass Herbarium and sent to SeagrassNet for verification.

Total cover of eelgrass and other seagrass is visually estimated as a percentage of each species in the quadrants. Canopy height is measured from an average height eelgrass in the quadrant. Any evidence of seagrass grazing is recorded.

2.3 Shediac River Site

The Shediac River Estuary site is located at Shediac Bridge just east of the Route 134 bridge (Table 1 & Figure 2). This site was established in August 2017. Access is possible from Route 134 across the riprap.

| Shediac River | | | | | | | |
|---------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
| Transect | Left | | Center | | Right | | |
| manseet | Latitude | Longitude | Latitude | Longitude | Latitude | Longitude | |
| Α | N 46°16'15.63" | W 64°34'24.52" | N 46°16'15.78" | W 64°34'23.38" | N 46°16'15.92" | W 64°34'22.23" | |
| В | N 46°16'16.49" | W 64°34'24.37" | N 46°16'16.57" | W 64°34'23.21" | N 46°16'16.69" | W 64°34'22.10" | |
| С | N 46°16'17.25" | W 64°34'24.41" | N 46°16'17.29" | W 64°34'23.20" | N 46°16'17.30" | W 64°34'22.08" | |



Figure 2. Shediac River eelgrass monitoring sites

2.3.1 Results

The 2022 sampling took place on September 12th. This site was heavily impacted by Hurricane Dorian in fall 2019. The eelgrass bed was devastated by the strength of the winds and waves. Since 2019, there has been barely any eelgrass left in the study areas. Continued monitoring will be useful to measure the recovery of this eelgrass bed.

2.3.1.1 Average height of eelgrass

Plant height at the Shediac River site has had no significant change since 2020. The average height of eelgrass had been increasing in years prior to 2019 in all transects, however, Hurricane Dorian eliminated the Shediac River eelgrass bed almost entirely. No measure of height could be taken in 2022 due to the absence of eelgrass (Figure 3).



Figure 3: Average Shediac River eelgrass height in centimetres per transect 2019-2022

2.3.1.2 Average Percentage of Cover

The average percent cover also has had no significant change since 2022. Similar to the average height, the average percent cover of eelgrass had been increasing yearly prior to 2019. The Shediac River transects had no presence of eelgrass (*Appendix A – Shediac River Site*), therefore no average percent cover could be measured in 2022 (Figure 4).

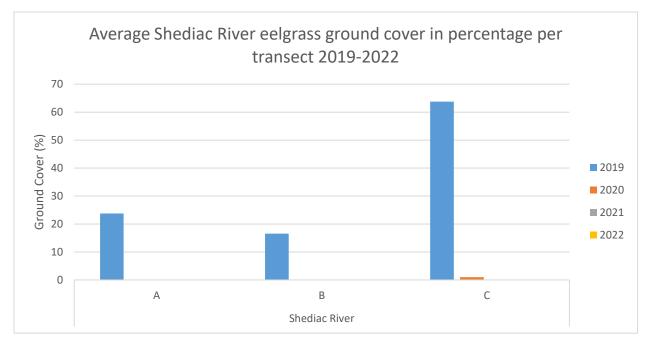


Figure 4: Average Shediac River eelgrass ground cover in percentage per transect 2019-2022

2.4 Scoudouc River Site

The site is located in the Scoudouc river estuary and is accessed from Heron Lane. The SBWA has received permission from the property owners to use the road and permission from the Greater Shediac Sewage Commission to park at their lift station for easy access to the beach (Figure 5). This site was established in 2016. In 2019, the site was re-established in an area slightly further north (Table 2). The nearshore (A) transect of the original site being too shallow for a proper assessment.

Table 2. Scoudouc river eelgrass monitoring site coordinates

| Scoudouc River | | | | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
| Transect | Left | | Center | | Right | | |
| Transect | Latitude | Longitude | Latitude | Longitude | Latitude | Longitude | |
| Α | N 46°13'37.37" | W 64°33'31.60" | N 46°13'36.54" | W 64°33'31.42" | N 46°13'35.84" | W 64°33'31.16" | |
| В | N 46°13'37.64" | W 64°33'30.09" | N 46°13'36.84" | W 64°33'29.89" | N 46°13'36.00" | W 64°33'29.74" | |
| С | N 46°13'37.89" | W 64°33'28.66" | N 46°13'37.12" | W 64°33'28.47" | N46°13'36.32" | W 64°33'28.25" | |



Figure 5. Scoudouc River eelgrass monitoring sites

2.4.1 Results

Sampling took place on August 12th, 2022. The Scoudouc River site was not completely eliminated by Hurricane Dorian but was still affected.

2.4.1.1 Average height of eelgrass

In both shallow (A) and mid-depth (B) transects, the average plant height has increased by 5 cm in 2022. These two transects are showing signs of recovery; however, they are still about half of what they were pre-Dorian (2019). The deep transect (C) was not as affected by hurricane Dorian. However, there has been a decrease of 12 cm in average eelgrass height for the deep transect in 2022 (Figure 6.).

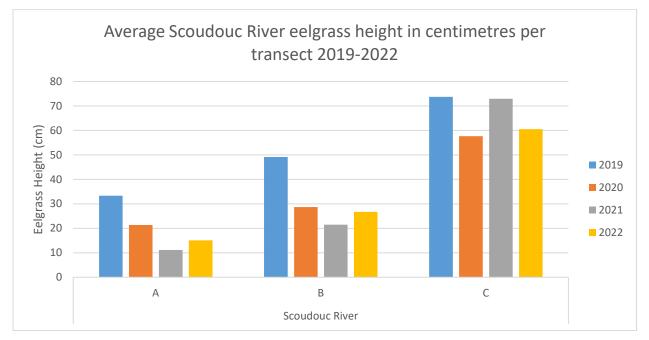


Figure 6: Average Scoudouc River eelgrass height in centimetres per transect 2019-2022

2.4.1.2 Average Percentage of Cover

The average percent cover of eelgrass showed the same trends as the average height. In both shallow and mid-depth transects there was an increase of 16% and 12% respectively in 2022. The offshore transect, however, has had a decrease of 7% (Figure 7).

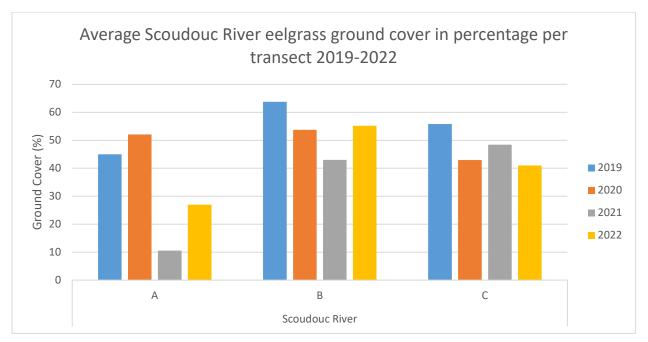


Figure 7: Average Scoudouc River eelgrass ground cover in percentage per transect 2019-2022

2.5 Pointe-du-Chêne Site

The Pointe-du-Chêne assessment site is located at the end of Stead Road (Table 3 & Figure 8).

| Table 2 Daints du Châ | na minan aalamaaa | monitoring site | acandinatas |
|-------------------------|-------------------|--------------------|-------------|
| Table 3. Pointe-du-Chêi | ae river eeigrass | s monitoring site. | coordinates |
| | | | |

| Pointe-du-Chêne | | | | | | | | |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|--|
| Transect | Left | | Center | | Right | | | |
| Tanseet | Latitude | Longitude | Latitude | Longitude | Latitude | Longitude | | |
| Α | N 46°13'51.21" | W 64°31'26.21" | N 46°13'51.68" | W 64°31'25.25" | N 46°13'52.13" | W 64°31'24.30" | | |
| В | N 46°13'53.39" | W 64°31'28.39" | N 46°13'53.90" | W 64°31'27.40" | N 46°13'54.34" | W 64°31'26.42" | | |
| С | N 46°13'55.32" | W 64°31'30.15" | N 46°13'55.71" | W 64°31'29.15" | N 46°13'56.18" | W 64°31'28.25" | | |



Figure 8: Point-du-Chêne eelgrass monitoring sites

2.5.1 Results

This site was sampled on August 8th and 10th, 2022. This site was also affected by Hurricane Dorian; however, it is showing signs of recovery.

2.5.1.1 Average height of eelgrass

This is the first year since hurricane Dorian that the average height of eelgrass in all sites has increased. Compared to 2021, the shallow transect has increased 10 cm, mid-depth and deep transects have both increased 5 cm (Figure 9).

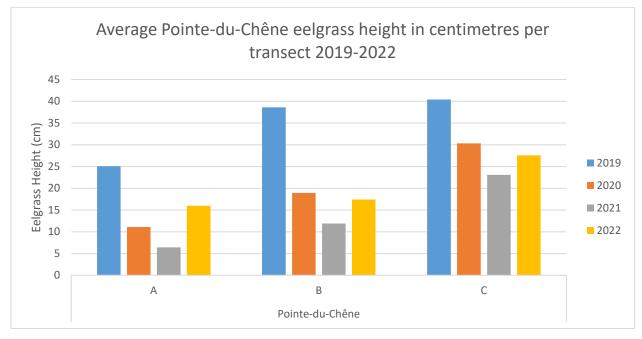


Figure 9: Average Pointe-du-Chêne eelgrass height in centimetres per transect 2019-2022

2.5.1.2 Average Percentage of Cover

The average percent cover has mostly decreased yearly since 2019. In 2022, all sites have had an increase in their plant cover. Mid-depth and deep transects both had an increased of 8%. The shallow transects had a slight increase of 3% (Figure 10).

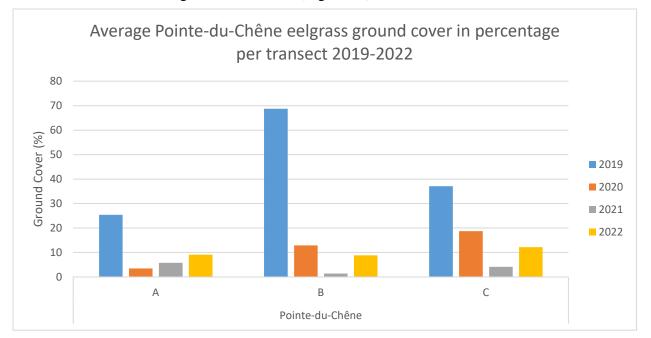


Figure 10: Average Pointe-du-Chêne eelgrass ground cover in percentage per transect 2019-2022

2.6 Grande-Digue Site

The Grande-Digue site was established near the Grande-Digue dune at the end of Allée des Faisans Road (Table 4 & Figure 11). Permission was obtained from the landowner for parking and access to the shore.

| Table 4. Grande-Digue ed | elgrass monitoring | site coordinates |
|--------------------------|--------------------|------------------|
|--------------------------|--------------------|------------------|

| Grande-Digue | | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|--|
| Transect | Left | | Center | | Right | | |
| Transect | Latitude | Longitude | Latitude | Longitude | Latitude | Longitude | |
| А | N 46°18'35.36" | W 64°31'10.69" | N 46°18'34.71" | W 64°31'11.39" | N 46°18'34.04" | W 64°31'11.99" | |
| В | N 46°18'34.31" | W 64°31'8.39" | N 46°18'33.67" | W 64°31'8.99" | N 46°18'32.94" | W 64°31'9.58" | |
| С | N 46°18'33.32" | W 64°31'6.09" | N 46°18'32.66" | W 64°31'6.71" | N 46°18'31.95" | W 64°31'7.40" | |



Figure 11: Grande-Digue eelgrass monitoring sites

2.6.1 Results

The sampling took place on August 26th and September 6th. This site was slightly affected by hurricane Dorian, however, it has since mostly recovered.

2.6.1.1 Average height of eelgrass

The eelgrass in Grand-Digue has shown signs of excellent recovery and was the least affected by Hurricane Dorian. However, all sites have had a decrease in average eelgrass height in 2022. Shallow, mid-depth and deep transects had a 1 cm, 13 cm, and 6 cm decrease in average eelgrass height respectively (Figure 12).

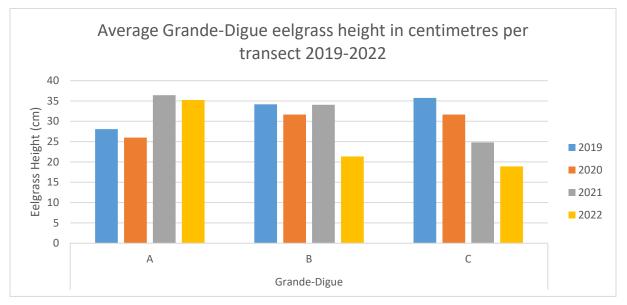


Figure 12: Average Grande-Digue eelgrass height in centimetres per transect 2019-2022

2.6.1.2 Average percentage of cover

The same trends were recorded in the average percent cover. The mid-depth and deep transects had a decrease of 7% and 30% respectively since 2020. The shallow transect, however, increased 17% (Figure 13).

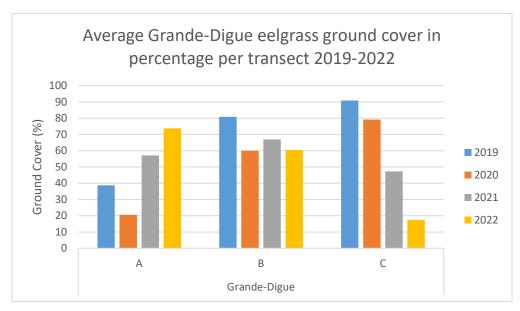


Figure 13: Average Grande-Digue eelgrass ground cover in percentage per transect 2019-2022

2.7 Summary of Results

The different parameters evaluated in eelgrass monitoring are percent cover, average number of plants, and total plant height. In this section, the parameters are compared across all eelgrass monitoring sites.

2.7.1 Average height of eelgrass

Looking at the maximum average plant height in each site, we see that the tallest plants on average are found in the deep transects of the Scoudouc River site (Figure 15). The plants at the Grande-Digue site are the least affected by Hurricane Dorian and in the shallow transect, plants have grown taller than pre-Dorian measurements (2019). The Point-du-Chêne site has had it's first increase in average plant height since 2019 across all transects. The Shediac river site is still suffering from the effects of Hurricane Dorian, no plants were available to record height (Figure 14).

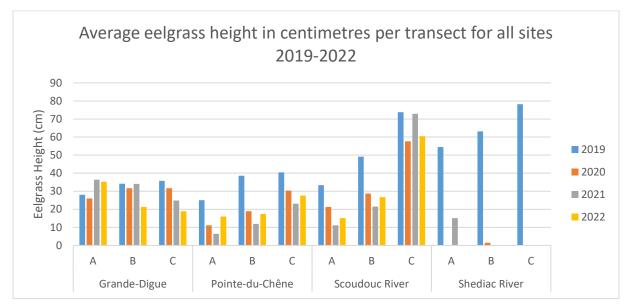


Figure 14: Average eelgrass height in centimetres per transect for all sites 2019-2022

2.7.2 Average percent cover

The Grande-Digue and Scoudouc River sites have the most percentage cover. They also show the best recovery from Hurricane Dorian. The Grande-Digue site is the only site to have a transect (Transect A) with a higher percentage cover post-Dorian. The Pointe-du-Chêne site was heavily affected by Dorian, however, for the first time since 2019, it is showing signs of recovery. Unlike the other sites, the Shediac River has not shown any signs of recovery since Hurricane Dorian. This hurricane caused a lot of damage to the coast and appears to have eliminated the eelgrass almost entirely (Figure 15).

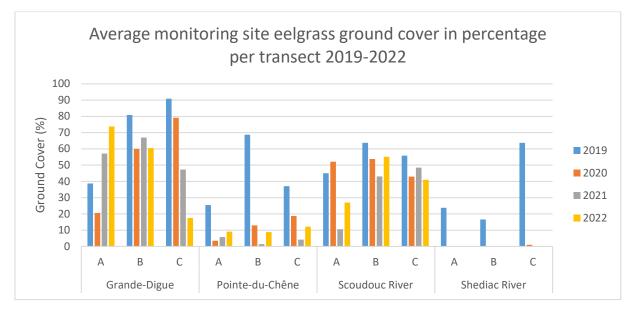


Figure 15: Average monitoring site eelgrass ground cover in percentage per transect 2019-2022

2.7.3 Average shoot density

In 2022, the Grande-Digue site had the highest plant density followed by Scoudouc River. Similar to the other parameters, the Grande-Digue and Scoudouc Rivers sites have had the greatest recovery following hurricane Dorian. The Pointe-de-Chêne site has shown some signs of recovery in 2022 (Figure 16).

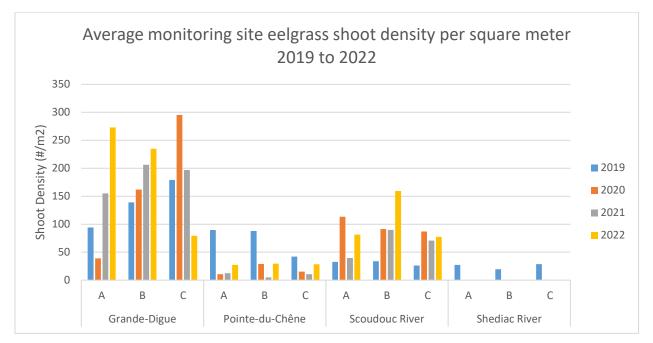


Figure 16: Average monitoring site eelgrass shoot density per square meter 2019 to 2022

3 Green Crab Monitoring

A native species in Europe and Northern Africa, the green crab has invaded the Atlantic and Pacific coasts of North America, South Africa, Australia, South America, and Asia. In North America, the distribution of green crabs now extends from Newfoundland to Virginia and from British Columbia to California (Klassen & Locke, 2007).

The green crab preys on a wide variety of marine organisms including commercially important species. Impacts on prey populations are greater in soft-bottom habitat and in environments sheltered from strong wave action. In the search for food, green crab has been documented to destroy eelgrass beds, a productive habitat for many juvenile fish species and crustaceans (Vercaener & Stephton, 2016). Destruction of this important habitat will have detrimental effects on the health of the Bay, as it has in other locations. The green crab also poses a serious threat to littoral communities, as it feeds on a variety of intertidal animals, including; fish, oysters, mussels, clams and juvenile crabs (Therriault, Herborg, Locke, & McKindsey, 2008)

In response to the discovery of the invasive European green crab in the Shediac Bay in 2010, the SBWA has been conducting a population monitoring program since 2013. After monitoring for nine consecutive years, both by sampling using Fukui traps and with the CAMP sampling program, valuable information has been gathered on their population trends and distribution in the Shediac Bay.

3.1 Methods

The green crab population monitoring will continue using the same protocol as previous years; ten Fukui crab traps are baited with sardines, attached to buoys, and placed throughout the Shediac Bay (Table 5 & Figure 17). The traps are placed for 24 hours, then are collected and emptied of their contents. The green crabs are counted, sexed and retained. All other species found in the traps are immediately released back into the water. The sampling is done from June to October, in the third or fourth week of the month depending on weather and tides.

| site | Green Crab – Site details | Coordinates | |
|------|--|----------------|-----------------|
| Α | Pass Under the Bridge Chez Leo | 46° 16' 17.52" | 64° 34' 32.44" |
| В | Bridge Chez Leo, left of boat launch point | 46° 16' 19.18" | 64° 34' 329.01" |
| С | In front of CAMP site (Oak Point) | 46° 16' 22.52" | 64° 33' 48.07" |
| D | Shediac Island (middle) off line of oyster lease buoys | 46° 15' 53.72" | 64°33'00.20" |
| E | Yellow House, shore before Friars | 46° 15' 15.87" | 64° 34' 02.86" |
| F | flag St Martins in Woods Rd | 46° 14' 06.84" | 64° 33' 38.09" |
| G | Before crossing bridge Scoudouc River Lobster from Marina | 46° 13' 10.98" | 64°33'16.69" |
| н | After crossing bridge opposite Shediac Lobster inside next to channel | 46° 13' 04.65" | 64°33'11.76" |
| I | Outer Shediac marina opposite crane | 46° 13' 34.70" | 64° 33' 43.45" |
| J | Pointe-du-Chêne inner South Cove (eelgrass site) | 46° 14' 06.62" | 64° 31' 26.75" |

 Table 5. Green crab monitoring sites coordinates



Figure 17. Green crab monitoring sites

3.2 Results

Since 2013, the amount of green crabs caught has fluctuated. Year-to-year comparisons in the green crab monitoring program are made using Catch Per Unit Effort (CPUE) due to varying sampling period lengths. CPUE is a metric used in fisheries science to estimate the amount of fish caught per unit of fishing effort, such as the number of fish caught per hour of fishing. It is commonly used to monitor changes in fish populations over time and to evaluate the effectiveness of different fishing strategies. A higher CPUE generally indicates a higher abundance of fish in the area being fished (Moreno & Morato, 2017).

The largest fluctuation occurred from 2015 to 2016; the CPUE went from 0.6 crab/hour to 7.8 crab/hour. The CPUE decreased from 2016 to 2019, however, it has been increasing since 2019 (Figure 18.).

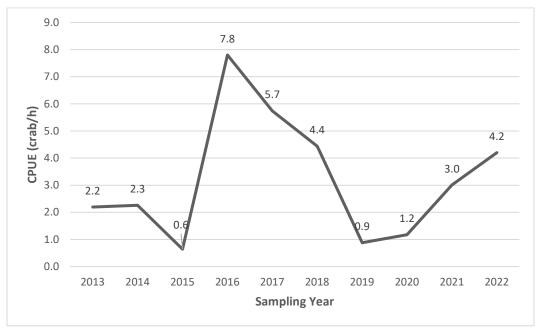


Figure 18: Total amount of green crab caught per year

The 2022 sampling was carried out from June to August and in October. Male crabs were the most abundant sex across all monitoring months. The month of August had the highest count of male to female ratio (Table 6). The highest counts of green crab were recorded in June at site C (Figure 19). Sampling sites experienced fluctuations of green crab populations throughout the monitoring period. High numbers of green crabs were caught at site B, C, F and I (Figure 19). These four sites are located in both the Shediac and Scoudouc River estuaries. The sites with the lowest amount of caught crabs through the 2022 monitoring period were sites E and J (Figure 19).

Table 6. Ratio of male to female caught per month for the 2022 sampling period



Figure 19: Number of green crabs caught per month for all monitoring site 2022

4 Rainbow Smelt Surveys

The rainbow smelt (*Osmerus mordax*) is an anadromous fish with a habitat distribution that spans across the North American east coast from Labrador to New Jersey (UNB, n.d.). This species is an important forage fish for many commercial and cultural significant species like the Atlantic cod (*Gadus morhua*), Atlantic salmon (*Salmo salar*), stripped bass (*Morone saxatilis*), and grey seal (*Halichoerus grypus*). The rainbow smelt are born in freshwater and spend most of their lives in saltwater. They only return to freshwater to spawn (Fuller, Maynard, Larson, Markled, & Bartos, 2022). Spawning of Rainbow Smelt occurs after ice-out in early spring. The eggs a very adhesive and stick to whatever they come in contact with. With a diameter of about 1mm, the eggs take two to three weeks to hatch (UNB, n.d.).

In partnership with the Université de Moncton, rainbow smelt surveys were carried out by the SBWA and other watershed groups in small streams and rivers in South Eastern New Brunswick, from Cocagne to Baie Verte. The surveys served to address the lack of data on rainbow smelt spawning areas along the Northumberland Strait.

4.1 Methods

The rainbow smelt surveys began in March 2022. The water temperature of a small local stream was checked daily to monitor for the start of spawning season. When water temperature approached 5°C, surveying began. Potential watercourses containing smelt spawning habitat were identified beforehand. Surveys consisted of checking the stream substrate for smelt eggs. The data recorded include:

- GPS coordinates
- Habitat type (run, riffle, pool)
- Stream bed composition (Fine, sand, gravel, cobble, bolder)
- Presence of human and organic debris
- Presence of dead or live fish
- Substrate where eggs are found
- Proportion of dead eggs
- Proportion of submerged/exposed eggs
- Length of spawning sites

4.2 Results

A total of 51 watercourses were identified as potential rainbow smelt spawning habitat in the Shediac bay watershed. Due to lack of access and private property, only 23 watercourses could be surveyed (Appendix B). Of the 23 sites, four were found to contain smelt eggs (Figure 20, 21, & 22). In, addition five sites were found to have a barrier to upstream spawning. The largest spawning area was located in the Calhoun Brook, with an area of around 1105m².



Figure 20: Smelt presence/absence survey results in the Shediac bay watershed



Figure 21: Smelt crowded in small stream in the Shediac bay watershed



Figure 22: Dead eggs (white dots) on stream substrate

5 Bank Swallow Surveys

The Bank Swallow is an aerial insectivorous bird that nests in colonies on vertical cliff faces or banks along waterbodies and human-made habitats. The causes of Bank Swallow population declines are unclear. Multiple factors likely have a cumulative impact on the species. The loss of natural nesting sites from erosion control measures and a reduction in prey availability as a result of climate change may create further pressure on the species (Environment and Climate Change Canada, 2021).

In 2022, a continuation of bank swallow surveys was undertaken by the SBWA. Surveys were carried out at Parlee Beach, Boudreau area, and Cap-de-Cocagne by summer students from mid-July to early August. The best time to record colony information is late May to mid July, however, the surveys were still carried out successfully. The surveyed sites were chosen based on past surveys. The summer students received training through Birds Canada's bank swallow videos.

5.1 Methods

The bank swallow surveys are based on visual observations. The field sheets used in the surveys were created by Birds Canada (Appendix C). The information recorded during the surveys is the following:

- Visit Details
 - o Temperature
 - o Wind
 - o Cloud cover
 - o Precipitation
 - o # of birds
 - o # of burrows
- Site and Habitat Details
 - o Colony locations
 - Site description
 - Colony habitat type
- Additional Information
 - o Colony history
 - o Colony length
 - Breeding evidence
 - Stewardship indicator

5.2 Results

A total of eight colonies were identified during the bank swallow surveys. Only one was recorded as not active. Most colonies were found in coastal bluff areas (Table 7). All colonies are within a 100m distance of either a building, roads, and/or shoreline hardening.

| Colony Number | Location | | | Habitat Type | Colony |
|------------------|----------------|----------|-----------|---------------|----------|
| | Area | Latitude | Longitude | Habitat Type | Activity |
| 1 | Parlee Beach | 46.24166 | 64.51466 | Dune | Yes |
| 2 | Parlee Beach | 46.24122 | 64.51218 | Dune | Yes |
| 3 | Boudreau | 46.24121 | 64.51219 | Coastal Bluff | Yes |
| 4 | Boudreau | 46.23889 | 64.48975 | Coastal Bluff | Yes |
| 5 | Cocagne | 46.33324 | 64.59824 | Coastal Bluff | Yes |
| 6 | Cocagne | 46.33389 | 64.60004 | Coastal Bluff | No |
| 7 | Cap-de-Cocagne | 46.33285 | 64.59743 | Coastal Bluff | Yes |
| 8 | Cap-de-Cocagne | 46.36301 | 64.54882 | Coastal Bluff | Yes |

Table 7: Bank swallow survey results overview

5.2.1 Parlee Beach

Two colonies were surveyed at Parlee Beach (Figure 23). These were the only colonies observed nesting in dunes. Both were active and had occupied nests with pairs of swallows. Bank swallows at colony 1 were observed carrying food and fecal sacs, both signs of an active and breeding colony. Due to the proximity to beach goers, the swallows were also observed having agitated behaviour including making anxiety calls. A total of 20 burrows and five swallows were counted at colony 1 (Figure 24). For colony 2, seven burrows and two swallows were counted (Appendix C).



Figure 23: Parlee Beach Provincial Park bank swallow colonies surveyed in 2022



Figure 24: Bank swallow burrows at Parlee beach

5.2.2 Boudreau Area

Two colonies were surveyed in the Boudreau area (Figure 25). These colonies are located in sandstone cliffs on private waterfront properties (Figure 26 & 27). Both colonies had occupied nests. Colony 3 had pairs of swallows sharing burrows and adults carrying fecal sac. Small groups of people (4-6) were seen in the vicinity of the colonies. These colonies are quite large with around 180 and 71 burrows for colonies 3 and 4 respectively (Appendix C).

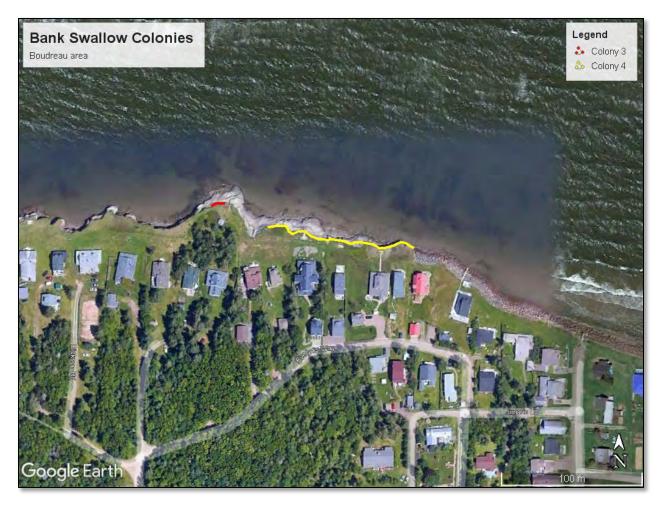


Figure 25: Boudreau area bank swallow colonies surveyed in 2022



Figure 26: Bank swallow burrows in the Boudreau area (1)



Figure 27: Bank swallow burrows in the Boudreau area (2)

5.2.3 Cocagne

Two colonies were surveyed in Cocagne (Figure 28). Similar to the Boudreau area colonies, these colonies are located in sandstone cliffs on private waterfront properties (Figure 29 & 30). A total of 116 burrows and 40 swallows were counted at colony 5. Colony 6 had seven burrows but had no swallow activity (Appendix C).



Figure 28: Cocagne bank swallow colonies surveyed in 2022



Figure 29: Bank swallow burrows in Cocagne (1)



Figure 30: Bank swallow burrows in Cocagne (2)

5.2.4 Cap-de-Cocagne

Two colonies were surveyed at the Cap-de-Cocagne (Figure 31). These colonies were also found in sandstone cliffs on private waterfront properties (Figure 32 & 33). Both were active and had occupied nests. A total of 46 burrows and two swallows were counted at colony 7. For colony 8, 28 burrows and three swallows were counted (Appendix C).



Figure 31: Cap-de-Cocagne bank swallow colonies surveyed in 2022



Figure 32: Bank swallow burrows in Cap-de-Cocagne (1)



Figure 33: Bank swallow burrows in Cap-de-Cocagne (2)

6 Environmental Restoration

6.1 Tait Brook Restoration

The Tait Brook underwent modifications as part of a flood protection plan; the area was cleared of trees so that the stream could be widened. This created a stormwater retention system to protect neighbouring infrastructure from flooding. New culverts were installed to protect roads from washouts. The restoration of the Tait Brook included the planting of native trees and shrubs, to reforest the new banks on an approximate 200m long section of the stream. The work took place between Donat and Clarence Street. Native vegetation was planted in order to recreate the natural ecosystem that was once present in that area.

The various native trees planted were sourced from the SBWA nursery. The placement of these trees is meant to mimic a natural forest patch. Due to a concern for the build up of organic debris in the downstream culvert, planting only occurred in the flat areas on the banks of the stormwater retention system. A total of 78 trees were planted:

- 23 Pine (*Pinus spp.*)
- 40 Spruce (*Picea spp.*)
- 15 Maple (Acer spp.)



Figure 34: Tait brook restoration area



Figure 35: Tait's brook planting arrangement

6.2 Dune Restoration and Protection

The SBWA was contacted by a citizen during the winter of 2021, with concerns about the degradation of the dune at Belliveau Beach in Pointe-du-Chêne. In 2022, a continuation of the dune fencing was undertaken by the SBWA. In an effort to fortify this local dune, about a half kilometre of dune fencing was installed at Belliveau beach. The fence started at the eastern limit of Parlee Beach and finished short of the canal. The length and surface area of this restoration project is 410 metres and 2, 756 square metres respectively.



Figure 36: Dune fencing at Belliveau beach

The fence was installed about five feet away from the dune as to allow for future growth of marram grass (*Ammophila spp.*). The fence keeps beach goers from getting too close to the dunes and allow for the establishment of marram grass. Marram grass is important as it helps lock the dunes in place thanks to their roots. This anchoring of the dunes plays an important role in preventing damage during high wind conditions. The root system can also encourage the colonization of other plants, which serve to further protect the dune.

The dune fencing is comprised of 50-foot-long segments of wooden snow fence. To secure the fence in place, they were attached to steel T-post using metal wire. The T-posts were imbedded into the sand at a depth of around three feet using a manual post driver. A portion of the fence was provided by the landowner.

Unfortunately, the entire dune fencing was destroyed by hurricane Fiona and the dune was severely damaged. The SBWA is planning on replacing the dune fencing and restoring the dune. Possible restoration actions include planting marram grass and using Christmas tree to capture windblown sand.



Figure 37: SBWA summer students installing dune fencing (left) and secured to t-post (right)



Figure 38: Dune fencing installed at Belliveau beach (Top & Bottom)

6.3 Japanese Knotweed Eradication

The Japanese knotweed (*Fallopia japonica*) is an invasive species originating from Asia that was introduced in the mid-1800s as an ornamental plant. Japanese knotweed thrives in various habitats, including riparian ecosystems and disturbed areas. It became a troublesome invader and considerable challenge to manage due to its efficient reproduction and dispersal. Native plant species are quite vulnerable to being outcompeted by a Japanese Knotweed. Growing up to heights of more than three metres, this invader can easily shade out other native plants. Native plants that are used for food and habitat by native insects, birds, and animals are replaced by this invader.

In 2022, two patches of invasive Japanese knotweed were targeted for eradication. The Japanese knotweed patches were discovered in the south cove marsh and on a private property in the town of Shediac. Both were approached with the same eradication measures. The eradication measures included the following:

- 1. Cut previous years' growth
- 2. Cover site with tarps to prevent new growth
- 3. Perform monthly cutting on new growth (May October)

The tarps and regular cutting prevent the plants from performing adequate photosynthesis. This method does not produce immediate results, however, overtime the Japanese knotweed patches might be weakened enough that they are eliminated.



Figure 39: Japanese knotweed patch on private property before (left) and during (right) eradication methods



Figure 40: South Cove Japanese knotweed patch during eradication

7 ENVIRONMENTAL CLEANUP

7.1 Beach Sweep

In celebration of World's Oceans Day, a public beach sweep event is organized every year by the SBWA, in partnership with the Town of Shediac. This activity aims to combat marine litter, to raise awareness, and contribute to the protection and conservation of our marine environment in the Shediac Bay.

This year, the event was held on June 4th at the Pointe-du-Chêne community centre. Trash bags, gloves, hand sanitizer were provided to the volunteers. Door prizes provided by Gestion H2O in the Baie de Caraquet were handed out. We would like to thank the 24 volunteers who came to collect 54 bags of trash, to help keep our shoreline clean this year.



Figure 41:Beach Sweep 2022

8 Education

8.1 Blue Flag Certification – Shediac Bay Yacht Club

The Shediac Bay Marina (Shediac Bay Yacht Club) received their Blue Flag certification in 2019. The certification is described as the following on the Blue Flag website (Blue Flag, n.d.):

A world-renowned award trusted by millions around the globe, the Blue Flag programme is run by the Foundation for Environmental Education and is headquartered in Copenhagen, Denmark. In order to qualify for this prestigious award, a series of stringent environmental, educational, safety-related and access-related criteria must be met and maintained.

The Blue Flag certification requires that marina's display information relating to local ecosystems and environmental elements. Environmental education and engagement activities are also encouraged.

As a privileged partner, the SBWA helps coordinate environmental awareness activities with the marina. In 2022, a trash cleanup was undertaken with the help of students from Louis J. Robichaud high school. The students were also given a presentation on the Blue Flag certification. This activity helps the marina reach their environmental and educational deliverables under the Blue Flag program.



Figure 42: L.J.R high school students picking up trash at the Shediac Marina

8.2 Blue Flag Certification – Parlee Beach

Parlee Beach Provincial Park also received their Blue Flag certification in 2019. The SBWA is proud to support the environmental education program at Parlee Beach, under the Blue Flag program.

Over the past few years, we have assisted with the facilitation of activities for school groups and the general public. Activities include on-site interpretation of the coastal ecosystem, such as the importance of sand dunes, the importance of salt marshes, and the various species of wildlife found at the beach (seabirds, fish, crabs, sand shrimp, etc.).

Other activities are often animated by the SBWA; treasure hunts, trash cleanups, fish sampling demonstrations, and various games from the Get Outside! NB and the Great Minds Think Outside Program. These games are science-based, designed to teach about nature while getting fresh air and exercise. The fish sampling, using a beach seine, offers the participants a first-hand view of some of the aquatic community species found in the saltwater ecosystem of the Shediac Bay.

In 2022, the SBWA assisted in the creation of three interpretation panels in partnership with CPAWS. The three themes are; the Shediac Bay, sand dunes and shallow-water species. Our role was the redaction of the panel texts, and the role of CPAWS is the design of the panels themselves. These panels will be ready for the 2023 beach season.



Figure 43: Parlee Beach Blue Flag Posters



8.3 Salt Marsh Field Trips

On June 3rd, a field trip was organized for a group of 10th grade students from the Polyvalent Louis-J.-Robichaud to the South Cove wetland in Pointe-du-Chêne.

The activities delivered come from the Ducks Unlimited Canada (DUC) Wetland Center of Excellence (WCE) program. Even though this salt marsh is not registered as a WCE, it is a great location that is full of biodiversity and is in close proximity to our local schools.

The field trip starts off with a presentation on wetlands in general, notions specific to salt marshes, and ecosystem services of coastal wetlands. A baited minnow trap is placed in the water and left alone until the end of the activities. The students then take a walk through the wetland, getting the opportunity to observe a variety of plant species as they head towards the pools of water within the marsh. The students get to do a critter dipping exercise; with the use of small dip nets, they get to sweep the muddy bed in search of saltwater invertebrates. The activity ends by checking the minnow trap and identifying anything caught before being released.



Figure 44: South Cove Wetland Field Trip with L.-J.-R. Students

8.4 Living Shoreline Workshop - Cocagne

The *Groupe de Développement Durable du Pays de Cocagne* (GDDPC) organized a series of coastal restoration and monitoring workshops, hosted by Rosmarie Lohnes of Helping Nature Heal (HNH).

The SBWA staff participated in these hands on workshops to learn the techniques of vegetating a rock wall (June 28 and August 23) and a coastal monitoring protocol using transects (August 24). Site visits were done in October with HNH, to evaluate the living shoreline projects in Cocagne, Shediac and Cap-Pelé post Fiona.

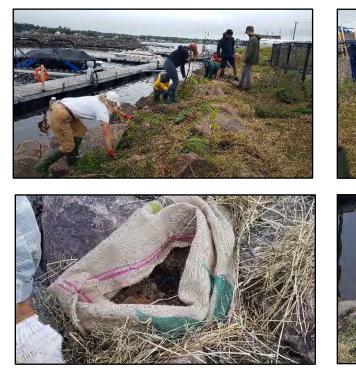


Figure 45: Vegetated rock wall workshop



Figure 46: Workshop on coastal monitoring transects

8.5 Increasing Capacity for Native Species Propagation- Workshop Series

In partnership with Vision H2O and the GDDPC, the SBWA helped organize two workshops to increase NGO's capacities to grow, propagate or purchase native species of plants, shrubs and trees. Increasing these capacities would allow environmental groups in New Brunswick for restoration projects at lower costs. The goal of these workshops are also to encourage a greater supply of native species in NB nurseries. For example, marram grass is in high demand for numerous NGO's for coastal restoration, yet no nurseries in NB have had it in stock this year.

On July 11, several groups attended the first workshop at Cornhill Nursery, hosted by Bob Osborne. This workshop focused on softwood cutting techniques for various species.

The next workshop will take place virtually, on March 16, titled "Increasing the availability of native plants in SENB".

Two surveys were developed and distributed through various channels prior to the workshop; one created for nurseries, the second for NGO's. The survey sent to nurseries is meant to collect information on the availability of native species, and to find out the barriers to increase their supply. The survey sent to NGO's aims to collect information on the species they often look for, and an estimated quantity needed per year. The results of the two surveys will help stimulate discussion during the workshop, as well as provide a perspective on the market that exists in NB for native species. The goal is for nurseries in New Brunswick to increase their supply to feed the demand. (Link for more information <u>https://nben.ca/en/get-involved/events/all-events/678-improving-availability-of-native-plants-in-senb.html</u>)





Figure 47: Cornhill workshop on softwood cuttings

9 Media Outreach

9.1 Media Appearance – Hurricane Fiona

Following the devastation caused by hurricane Fiona on September 24, multiple news outlets contacted the SBWA for interviews on the impacts on our coastal ecosystems. Several on-site interviews were given to show the damages caused to the shoreline and dune systems.

This was an opportunity to talk about these fragile ecosystems, and to discuss the importance of the natural ecosystem services along our shorelines and the importance of coastal restoration.

Interviews were given to Radio-Canada on September 28th, 29th and October 1st. An interview was given to CBC on October 2nd, to Global News on October 4th and to the Times & Transcript on October 5th.



Figure 48: Global News televised interview on Fiona damages to dune ecosystems

https://ici.radio-canada.ca/ohdio/premiere/emissions/lamatinale/segments/entrevue/427479/sapin-noel-erosion-cote-tempete https://www.cbc.ca/news/canada/new-brunswick/nb-marram-grass-1.6603555 https://globalnews.ca/news/9178401/new-brunswick-sand-dunes-lost-fiona-storm/ https://ici.radio-canada.ca/nouvelle/1921154/dominique-leblanc-fiona-dommages-forces-armeescanadiennes

9.2 Newsletter

During the 2022-2023 fiscal year, 2 bilingual newsletters were produced. One was published in the fall and the second will be released in March. The newsletters display information and photos on the various projects that the SBWA has been doing in the year. The newsletter is now distributed electronically by email list and is available on our website and Facebook page.

9.3 Socials Medias and Website

The SBWA is working to keep its website and social media up to date, posting photos and short description of activities and projects. The SBWA now has a dedicated employee who focuses on outreach and communications, and the design and production of educational materials.





10 Closing Comments

The evaluation, restoration and stewardship of the Shediac Bay program has had another successful year. The aim of the program is to identify areas and ecosystems that can benefit from restoration activities and gather data on the health of the various ecosystems and vulnerable species of the Shediac Bay.

The eelgrass monitoring program was continued and will be used to assess the evolution of eelgrass beds in Shediac Bay. Sites that have been sampled over several years are already showing changes. However, several more years of sampling are required to see trends. Participation in the Ecology Action Centre's eelgrass working group will enable comparisons between different bays in New Brunswick, Nova Scotia and Prince Edward Island.

Green crab catches increased in numbers in the summer of 2022. The total catch was 403 crabs, up only lightly from 393 in 2021. The highest total catch of 817 crabs was reached in 2016. The monitoring of eelgrass and green crabs will make it possible to establish the impact of the arrival of this invasive species in Shediac Bay. More details on the monitoring of green crabs are described in the report available on our website.

In the coming years, there will be sufficient data to establish conservation and restoration priorities. Meetings with the EAC eelgrass consortium and the Department of Fisheries and Oceans will determine if restoration activities are feasible and desirable. The SBWA wants the ecological integrity of Shediac Bay to be maintained in the face of invasive species and climate change.

A coastal restoration and protection committee was started with neighbouring environmental groups to help coordinate efforts along the coast of South Eastern New Brunswick. This group is involved in planning priorities for conservation of the coastal zone. Our groups are a part of a greater collective; the Healthy Coast partnership, coordinated by Nature NB. This larger collective increases our capacity for knowledge and skills to take our projects to the next level.

The work around dune restoration has captured the attention of our community and of news media outlets. After the devastation from hurricane Fiona, there was a significant increase of interest in coastal protection and restoration.

The Shediac Bay Watershed Association will continue the various educational campaigns around the health of the Shediac Bay. Stewardship activities with the public such as shoreline clean-ups and tree planting activities will resume as soon as public health regulations permit.

The partnerships with the local marinas will continue to promote best practices for boaters of Shediac Bay. Other partnerships such as the Beach Sweep with the Town of Shediac and Shediac Bay Marina will help increase awareness around the importance of a healthy environment.

The Shediac Bay Health Evaluation project has gathered a wide range of information since 2016. The project will continue to expand in the coming years with increasing partnerships. There is still more that can be done to advance our knowledge. As the project evolves, the Association will concentrate on more stewardship projects to help improve the environment around Shediac Bay.



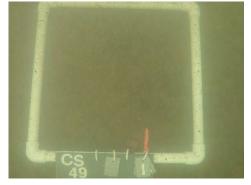
Figure 49: Salt marsh in Grande-Digue

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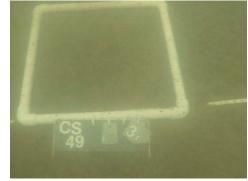
APPENDIX A – Eelgrass Transect Images



Shediac River A1



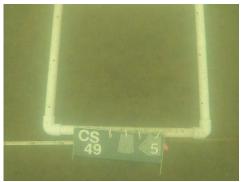
Shediac River A2



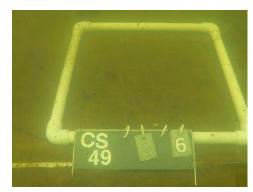
Shediac River A3



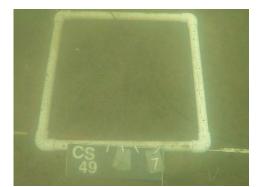
Shediac River A4



Shediac River A5



Shediac River A6



Shediac River A7



Shediac River A8



Shediac River A9



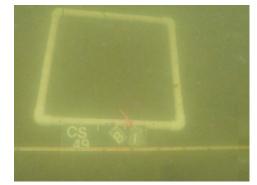
Shediac River A10



Shediac River A11



Shediac River A12



Shediac River B1



Shediac River B2



Shediac River B3



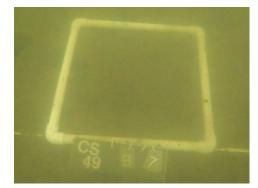
Shediac River B4



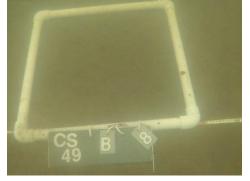
Shediac River B5



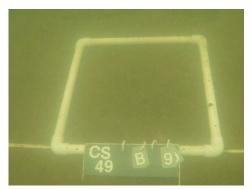
Shediac River B6



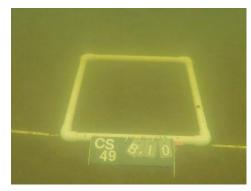




Shediac River B8



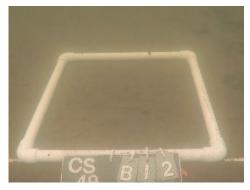
Shediac River B9



Shediac River B10



Shediac River B11



Shediac River B12



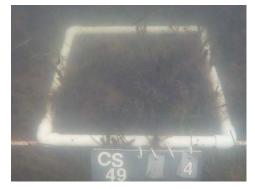
Scoudouc River A1



Scoudouc River A2



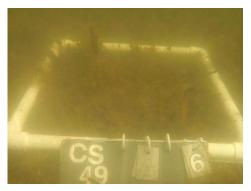
Scoudouc River A3



Scoudouc River A4



Scoudouc River A5



Scoudouc River A6



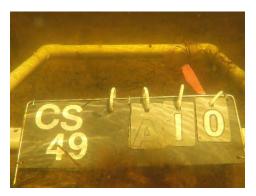
Scoudouc River A7



Scoudouc River A8



Scoudouc River A9



Scoudouc River A10



Scoudouc River A11



Scoudouc River A12



Scoudouc River B1



Scoudouc River B2



Scoudouc River B3



Scoudouc River B4



Scoudouc River B5



Scoudouc River B6



Scoudouc River B7



Scoudouc River B8



Scoudouc River B9



Scoudouc River B10



Scoudouc River B11



Scoudouc River B12



Scoudouc River C1



Scoudouc River C2



Scoudouc River C3



Scoudouc River C4



Scoudouc River C5



Scoudouc River C6



Scoudouc River C7



Scoudouc River C8



Scoudouc River C9



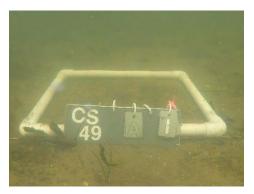
Scoudouc River C10



Scoudouc River C11



Scoudouc River C12



Pointe-du-Chêne A1



Pointe-du-Chêne A2



Pointe-du-Chêne A3



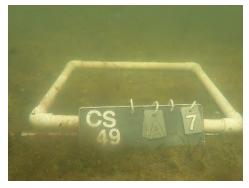
Pointe-du-Chêne A4



Pointe-du-Chêne A5



Pointe-du-Chêne A6



Pointe-du-Chêne A7



Pointe-du-Chêne A8



Pointe-du-Chêne A9



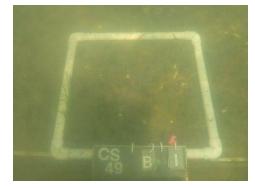
Pointe-du-Chêne A10



Pointe-du-Chêne A11



Pointe-du-Chêne A12



Pointe-du-Chêne B1



Pointe-du-Chêne B2



Pointe-du-Chêne B3



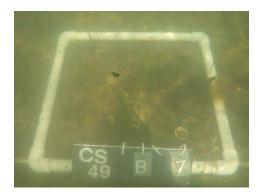
Pointe-du-Chêne B4



Pointe-du-Chêne B5



Pointe-du-Chêne B6



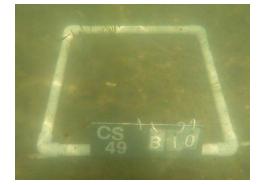
Pointe-du-Chêne B7



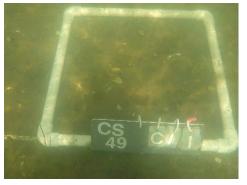
Pointe-du-Chêne B8



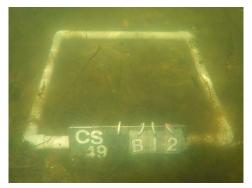
Pointe-du-Chêne B9



Pointe-du-Chêne B10



Pointe-du-Chêne B11



Pointe-du-Chêne B12



Pointe-du-Chêne C1



Pointe-du-Chêne C2



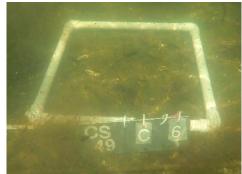
Pointe-du-Chêne C3



Pointe-du-Chêne C4



Pointe-du-Chêne C5



Pointe-du-Chêne C6



Pointe-du-Chêne C7



Pointe-du-Chêne C8



Pointe-du-Chêne C9



Point-du-Chêne C10



Pointe-du-Chêne C11



Pointe-du-Chêne C12



Grande-Digue A1



Grande-Digue A2



Grande-Digue A3



Grande-Digue A4



Grande-Digue A5



Grande-Digue A6



Grande-Digue A7



Grande-Digue A8



Grande-Digue A9



Grande-Digue A10



Grande-Digue A11



Grande-Digue A12



Grande-Digue B1



Grande-Digue B2



Grande-Digue B3



Grande-Digue B4



Grande-Digue B5



Grande-Digue B6



Grande-Digue B7



Grande-Digue B8



Grande-Digue B9



Grande-Digue B10



Grande-Digue B11



Grande-Digue B12



Grande-Digue C1



Grande-Digue C2



Grande-Digue C3



Grande-Digue C4



Grande-Digue C5



Grande-Digue C6







Grande-Digue C8



Grande-Digue C9



Grande-Digue C10



Grande-Digue C11



Grande-Digue C12

APPENDIX B – Smelt Data and Maps

| Watercourse Code | Eggs found | Stream barrier | Habitat type | Dead egg % | Eggs submerged % | Length of site |
|---------------------|------------|--------------------|--------------|---------------|------------------------|-------------------|
| S2 | No | | | | | |
| S3 | No | | | | | |
| S5 | No | | | | | |
| S6 | No | | | | | |
| S7 | No | | | | | |
| S8 | No | | | | | |
| S9 | No | | | | | |
| S10 | Yes | Perched culvert | Riffle | 5% | 100% | 5m |
| S11 | No | | | | | |
| S12 | No | | | | | |
| S13 | No | | | | | |
| S14 | No | | | | | |
| S24 | Yes | Perched culvert | Run | 1% | 100% | 150m |
| S24A | Yes | | Riffle | 50% | 100% | 5m |
| S28 | Yes | | Riffle/Run | 5% | 95% | 50m |
| S31 | No | | | | | |
| S32 | No | | | | | |
| S33 | No | | | | | |
| S37 | No | | | | | |
| S38A | No | | | | | |
| S38B | No | | | | | |
| S38C | No | | | | | |
| S39 | No | | | | | |
| S40 | No | | | | | |
| S43 | No | Perched culvert | | | | |
| S45 | No | | | | | |
| S46 | No | Perched cu;vert | | | | |
| S47 | No | | | | | |

Table B 1: Smelt survey site results

| | | S | ubstrate c | omposition | | | |
|---------------------|--------------------|-----------------------|-------------------------|---------------------------|-------|-------------------|-----------------|
| Watercourse Code | Fines (<0.05mm) | Sand (0.06- 2.5mm) | Gravel (2.6- 53mm | Pebbles (54- 460mm) | Algae | Organic debris | Human debris |
| S2 | | | | | | | |
| S3 | | | | | | | |
| S5 | | | | | | | |
| S6 | | | | | | | |
| S7 | | | | | | | |
| S8 | | | | | | | |
| S9 | | | | | | | |
| S10 | | 60% | 10% | 30% | | х | |
| S11 | | | | | | | |
| S12 | | | | | | | |
| S13 | | | | | | | |
| S14 | | | | | | | |
| S24 | 10% | 20% | 10% | 60% | | х | х |
| S24A | 10% | 10% | 20% | 60% | | | |
| S28 | | 20% | | 80% | | х | |
| S31 | | | | | | | |
| S32 | | | | | | | |
| S33 | | | | | | | |
| S37 | 20% | 30% | 20% | 30% | | х | х |
| S38A | | | | | | | |
| S38B | | | | | | | |
| \$38C | 0% | 5% | 25% | 70% | | | |
| S39 | 5% | 15% | 30% | 50% | х | х | Х |
| S40 | 30% | 10% | 30% | 30% | | х | х |
| S43 | 5% | 35% | 20% | 40% | х | х | Х |
| S45 | 10% | 20% | 10% | 50% | х | х | х |
| S46 | | | | | | | |
| S47 | | | | | | | |

 Table B 2: Smelt survey stream bed composition

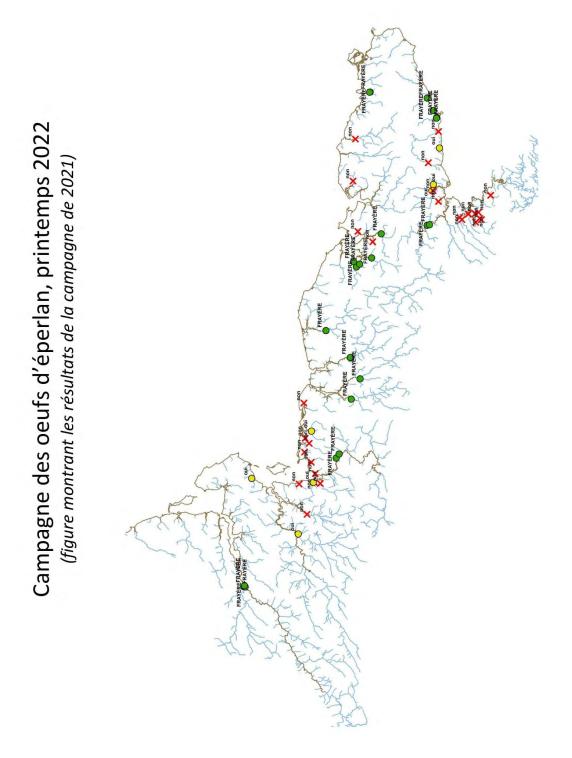


Figure B 1: Smelt egg campaign map 2022

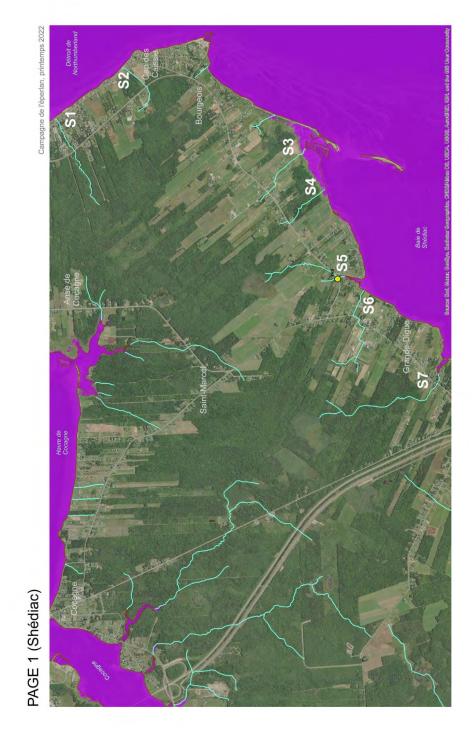
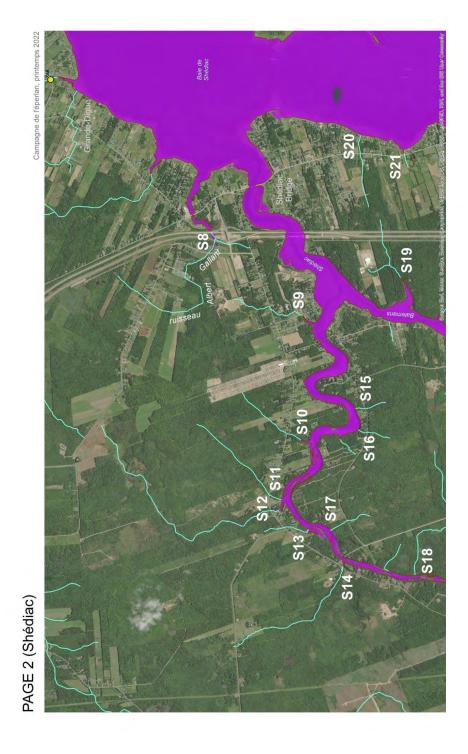
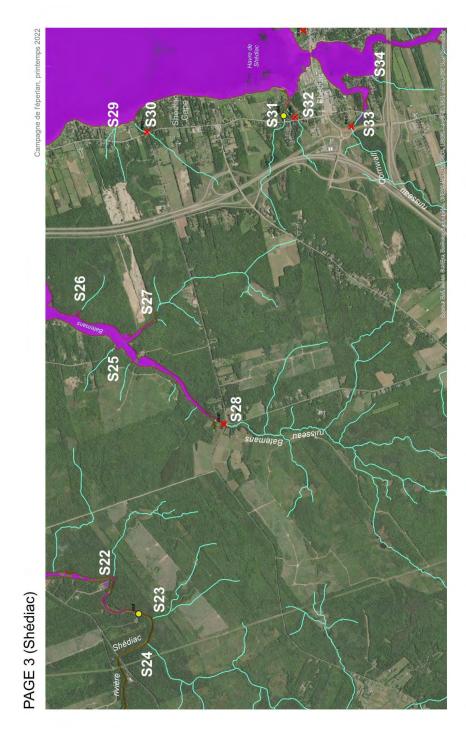


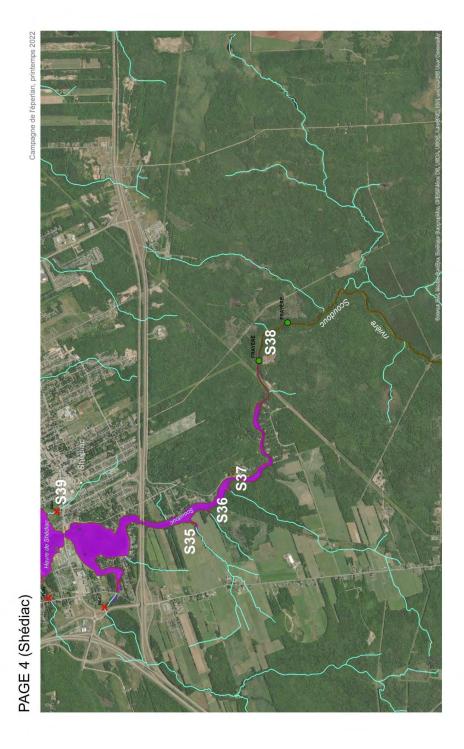
Figure B 2: Potential smelt spawning watercourses in the Shediac bay watershed pg.1

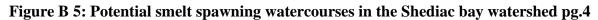


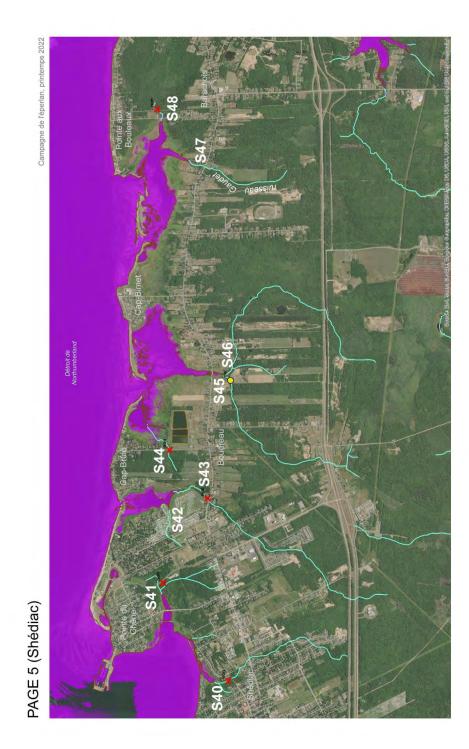














APPENDIX C – Bank Swallow Survey Field Sheets

| | rallow Co | | cord Form |
|---|--|--|--|
| Observer Details | ing to fig kilowin | /r | |
| Name: Chloe + Grace Phone: | (506) 5 | 33 - 888 | 0_Email: Shwa @ hbnet.nb. ca |
| Visit Details | | | |
| Date (dd-mm-yy): 15 - 07 - 22 Start time (| 24hr): 2.001 | en End tim | e (24hr): 1:45 am Temp. (*C): 23*C |
| Wind: 4 Cloud Cover: 1 Precipitation | n: 0 (se | e reverse fo | r weather codes) |
| # of birds: <u>5</u> # of burrows: <u>20</u> Colo +# | ony active (see | e reverse for | description): 🗹 Yes 🗆 No 🐳 |
| Site and Habitat Details | | 0.0x - | |
| Colony Location: N 46 24166° 4 | 064 51 | 466 | [lat, lang coordinates in decimal degrees |
| Site Description (access, nearest community, la | ndowner det | ails): | |
| Parlee Beach | | | |
| Shediac Dublic | | _ | |
| A Review of the second s | | | |
| | | | |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch | nange): | | |
| Comments (has colony moved - how far, size ch | degrees) H | low coordin | ates were obtained (e.g. GPS unit, Google Maps |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length <i>(lat, long coordinates in decimal</i> Start N 46 24166° W 064 51466 | degrees) H | low coordin | |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 $\%$ 064 5146 End N 46 24165 $\%$ 064 514 | degrees) H | low coordin GPS | to 3 boxes representing the dominant |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166° W 064 51466 End N 46 24165° W 064 514 | degrees) H | low coordin GPS Check up habitat(s) | ates were obtained (e.g. GPS unit, Google Maps u_n ; $\frac{1}{2}$ to 3 boxes representing the dominant within a 200 m radius surrounding the colony |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 064 51466 End N 46 24165 064 514 Photo of colony site: 07 Yes \Box No | degrees) H | low coordin GPS Check up habitat(s) | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 W 064 51466 End N 46 24165 W 064 514 Photo of colony site: Q Yes \Box No Breeding Evidence: P , ON, CF, A | degrees) H | low coordin GPS Check up habitat(s) Forested | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 W 064 51466 End N 46 24165 W 064 514 Photo of colony site: Q Yes \Box No Breeding Evidence: P , ON, CF, A | degrees) H | low coordin GPS Check up habitat(s) Forested Open - | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 $\&$ 064 51466 End N 46 24165 $\&$ 064 514 Photo of colony site: $@$ Yes \Box No Breeding Evidence: P , ON, CF, A isee reverse for codes) | degrees) H | low coordin GPS Check up habitat(s) Forested | ates were obtained (e.g. GPS unit, Google Maps 4n; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 W 064 51466 End N 46 24165 W 064 514 Photo of colony site: Q Yes \Box No Breeding Evidence: P , ON, CF, A | degrees) H | low coordin GPS Check up habitat(s) Forested Open - | ates were obtained (e.g. GPS unit, Google Maps 40; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 \odot 064 51466 End N 46 24165 \odot 064 514 Photo of colony site: \Box Yes \Box No Breeding Evidence: P, ON, CF, A see reverse for codes) Stewardship Indicator | degrees) H (2) P ES Kalon | low coordin GPS Check up habitat(s) Forested Open - | ates were obtained (e.g. GPS unit, Google Maps 40.7 + to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 W 064 51466 End N 46 24165 W 064 514 Photo of colony site: Yes \Box No Breeding Evidence: P, ON, CF, A see reverse for codes) Stewardship indicator Proximity to rip rap/shoreline hardening (m) | tegrees) + (2) - - - - - - - - - - - - - - - - - - - | Check up habitat(s) Forested Open - Dry | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 $@$ 064 51466 End N 46 24165 $@$ 064 514 Photo of colony site: $@$ Yes \Box No Breeding Evidence: $P_{,ON,CF,A}$ See reverse for codes) Stewardship indicator Proximity to rip rap/shorelline hardening (m) Proximity to buildings (m) | degrees) H (2) P ES Kalon | Check up habitat(s) Forested Open - Dry Open - | ates were obtained (e.g. GPS unit, Google Maps 40.7 + to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh = 5ql † |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 W 064 51466 End N 46 24165 W 064 514 Photo of colony site: Ø Yes □ No Breeding Evidence: PONCFA (see reverse for codes) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to puldings (m) Proximity to roads (m) | tegrees) + 1210 ES # 400 m 400 m 400 m | Check up habitat(s) Forested Open - Dry | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh = 541‡ Fen |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 $@$ 064 51466 End N 46 24165 $@$ 064 514 Photo of colony site: $@$ Yes \Box No Breeding Evidence: $P_{,,0}ON, CF_{,A}$ (see reverse for codes) Stewardship indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen | tegrees) + 1210 ES # 400 m 400 m 400 m 400 m 400 m 400 m 400 m 400 m | Check up habitat(s) Forested Open - Dry Open - Wet | ates were obtained (e.g. GPS unit, Google Maps 40.7 ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh = 5 al ‡ Fen Bog |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 $@$ 064 51466 End N 46 24165 $@$ 064 514 Photo of colony site: $@$ Yes \Box No Breeding Evidence: $P_{,ON,CF,A}$ Stewardship indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen - on-leash | Hange): degrees) H (21° FS B 20 H 400 H 400 H 400 H 400 H 20 0 0 | Check up habitat(s) Forested Open - Dry Open - | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh = 54l ‡ Fen Bog Industrial Agricultural Residential |
| Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal Start N 46 24166 \odot 064 51466 End N 46 24165 \odot 064 514 Photo of colony site: \Box Yes \Box No Breeding Evidence: P, ON, CF, A isee reverse for codes) Stewardship indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen - on-leash Max. number of dogs seen - off-leash Additional notes (e.g. other threats, activities, sp | Hange): degrees) H (21° FS B 20 H 400 H 400 H 400 H 400 H 20 0 0 | Check up habitat(s) Forested Open - Dry Open - Wet Human- | ates were obtained (e.g. GPS unit, Google Maps un; ‡ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh = 5al‡ Fen Bog Industrial Agricultural |

Figure 50: Bank swallow survey for colony 1

4

-

| CANADA OISEAUX CANADA Bank Sw | allow Co | olony Rea | cord Form |
|---|--|---|--|
| Observer Details | ny ID (if know | n): | |
| | 1.1.1 | 1000 | |
| Name: Chloe + Grale Phone: | (506) | 533-888 | Email: Shwin@nbnet. nb.ca |
| Visit Details | | | |
| Date (dd-mm-yy): 15-07-22_Start time (| 24hr): 3 00 | PM End tim | e (24hr): 3-10 pm Temp. (°C): 122FC |
| Wind: 4 Cloud Cover: 1 Precipitatio | n:_0_ (s | ee reverse fo | r weather codes) |
| # of birds: # of burrows: Colo | my active (se | e reverse for | description): 🗹 Yes 🗆 No |
| Site and Habitat Details | | | |
| Colony Location: N46 24123 | NO64.5 | 12.18" | (lat, long coordinates in decimal degrees) |
| ite Description (access, nearest community, la | | | |
| Parlee Brach Shediac | | | |
| Public | | | |
| additional Information (Optional) | ous years? E | | e 🗆 Other |
| Additional Information (Optional) Colony History: has this site been used in previo Comments (has colony moved - how far, size ch | ous years? E ange): |]Yes 🗆 Na | o 🖾 Unknown If Yes, for how long?years |
| Additional Information (Optional) Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length <i>(lat, long coordinates in decimal)</i> tartN 46. ユリスス ° W 064.51218 | ous years? E ange): |]Yes 🗆 Na | D Unknown If Yes, for how long?years |
| Additional Information (Optional) Colony History: has this site been used in previo comments (has colony moved - how far, size ch colony Length (lat, long coordinates in decimal) tart <u>N 46.34133° W 664.51318</u> nd <u>Refers</u> long | ous years? E ange): | I Yes □ No low coordina GPS □ Check up 1 | Unknown If Yes, for how long?years tes were obtained (e.g. GPS unit, Google Maps) a; f |
| Additional Information (Optional) Colony History: has this site been used in previo comments (has colony moved - how far, size ch colony Length (lat, long coordinates in decimal) tart <u>N 46.34133° W 664.51318</u> nd <u>Refers</u> long | ous years? E ange): | I Yes □ Ne low coordina GP5 □ Check up habitat(s) | Unknown If Yes, for how long?years ates were obtained (e.g. GPS unit, Google Maps) art to 3 boxes representing the dominant within a 200 m radius surrounding the colony |
| Additional Information (Optional) colony History: has this site been used in previous comments (has colony moved - how far, size ch colony Length (lot, long coordinates in decimal tart $N H_{6} 34/33^{\circ} W 064.51318$ nd $3 meters long$ hoto of colony site: W Yes \Box No | ous years? E ange): | I Yes □ No low coordina GP5 □ Check up habitat(s) | Unknown If Yes, for how long?years tes were obtained (e.g. GPS unit, Google Maps) a; f |
| additional Information (Optional) olony History: has this site been used in previous comments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal) tart $N = 46, 34133^{\circ} = W = 664, 51318$ and $3 = 32673 = 1000$ hoto of colony site: W Yes \Box No reeding Evidence: $P = ON$ | ous years? E ange): | I Yes □ No low coordina GP5 □ Check up habitat(s) | The second secon |
| additional Information (Optional) olony History: has this site been used in previous comments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal) tart \underline{N} $\underline{4}_{\underline{6}}$, $\underline{3}\underline{4}_{\underline{1}}\underline{3}_{\underline{2}}^{\circ}$ \underline{W} $\underline{6}\underline{6}\underline{4}_{\underline{1}}\underline{5}_{\underline{1}}\underline{3}_{\underline{8}}^{\circ}$ nd $\underline{3}$ \underline{meEers} $\underline{10}\underline{ng}$ hoto of colony site: \underline{W} Yes \Box No reeding Evidence: $\underline{P}_{\underline{0}}$, $\underline{ON}_{\underline{1}}$, $$ | degrees) | I Yes □ No GP5 □ Check up t habitat(s) Forested | Unknown If Yes, for how long?years ates were obtained (e.g. GPS unit, Google Maps) m1+ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature |
| additional Information (Optional) olony History: has this site been used in previous comments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal) tart \underline{N} $\underline{4}_{6}$, $\underline{3}_{4}_{1}_{3}_{3}_{2}^{\circ}$ \underline{W} $\underline{6}_{6}_{4}_{4}_{5}_{5}_{3}_{1}_{3}_{8}$ and \underline{A} $\underline{M}_{6}_{6}_{6}_{7}_{7}_{7}_{1}_{2}_{9}^{\circ}$ \underline{W} $\underline{6}_{6}_{4}_{4}_{5}_{5}_{1}_{3}_{1}_{8}^{\circ}$ hoto of colony site: \underline{W} Yes \Box No reeding Evidence: $\underline{P}_{0}_{1}_{9}_{1}_{1}_{9}_{1}_{1}_{9}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{2}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1}_{1$ | degrees) | Yes □ No dow coordina GP5 0 Check up t habitat(s) Forested Open - | Unknown If Yes, for how long?years ates were obtained (e.g. GPS unit, Google Maps) art to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassiand |
| additional Information (Optional) olony History: has this site been used in previous comments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal) tart \underline{N} 46, 34133° \underline{W} 664, 51318 ad $\underline{3}$ meters long hoto of colony site: \underline{W} Yes \Box No reeding Evidence: \underline{P} ON <i>ee reverse for codes</i>) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) | degrees) H | Yes □ No dow coordina GP5 0 Check up t habitat(s) Forested Open - | Unknown If Yes, for how long?years ates were obtained (e.g. GPS unit, Google Maps) art+ to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassiand Hayfield |
| additional Information (Optional) olony History: has this site been used in previous omments (has colony moved - how far, size charactering the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering that the colony moved - how far, size charactering to colony moved - how far, size charactering the | degrees) F | I Yes □ No GPS 0 Check up habitat(s) Forested Open - Dry | Unknown If Yes, for how long?years tes were obtained (e.g. GPS unit, Google Maps) n;t to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land |
| additional Information (Optional) olony History: has this site been used in previous comments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal) tart \underline{N} 46, 34133° \underline{W} 664, 51318 ad $\underline{3}$ meters long hoto of colony site: \underline{W} Yes \Box No reeding Evidence: \underline{P} ON <i>ee reverse for codes</i>) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) | degrees) H ange): degrees) H 20 M 40 M 100 M 100 M | Yes □ No dow coordina GP5 0 Check up t habitat(s) Forested Open - | Unknown If Yes, for how long?years tes were obtained (e.g. GPS unit, Google Maps) n;t to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Cropland |
| Additional Information (Optional) Iolony History: has this site been used in previous Iolony Length (lat, long coordinates in decimal) Iolony Length (lat, long coordinates in decimal) Itart N Ind Imterior Ind Imterior Ind Imterior Interior Iong hoto of colony site: Iong Interior Iong Stewardship Indicator Iong Proximity to rip rap/shoreline hardening (m) Iong Proximity to roads (m) Max. number of people seen | tion years? E ange): degrees) F 2 2 4 2 2 4 2 100 m 5 100 m 5 100 m 2 2 2 | I Yes □ No GPS 0 Check up habitat(s) Forested Open - Dry | b Vunknown If Yes, for how long?years tetes were obtained (e.g. GPS unit, Google Maps) (a; f to 3 boxes representing the dominant within a 200 m radius surrounding the colony Voung, successional Mature Grassland Hayfield Pasture/grazing land Gropland Abandoned cropland/fallow field Marsh - Salf Fen |
| Additional Information (Optional) olony History: has this site been used in previous omments (has colony moved - how far, size ch olony Length (lat, long coordinates in decimal, tart \underline{N} 46, 34133° \underline{W} 664, 51318 ind \underline{A} meters long hoto of colony site: \underline{P} , \underline{ON} ,, ee reverse for codes) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen on-leash | tillon | Yes □ No GPS □ Check up habitat(s) Forested Open - Dry Open - | b Vunknown If Yes, for how long?years attes were obtained (e.g. GPS unit, Google Maps) attes were obtained (e.g. GPS unit, Google Maps) attes boxes representing the dominant within a 200 m radius surrounding the colony Voung, successional Mature Grassiand Hayfield Pasture/grazing land Gropland Abandoned cropland/fallow field Marsh - Sal/f Fen Bog |
| Additional Information (Optional) Colony History: has this site been used in previous Colony History: has this site been used in previous Colony Length (lat, long coordinates in decimal, tart N Additional Information (Optional) colony Length (lat, long coordinates in decimal, tart N tart N Ameters Iong hoto of colony site: Yes No reeding Evidence: P ON see reverse for codes) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash | tion years? E ange): degrees) F 2 2 4 2 2 4 2 100 m 5 100 m 5 100 m 2 2 2 | Yes □ Na GPS □ Check up habitat(s) Forested Open - Dry Open - Wet Human- | b Vunknown If Yes, for how long?years attes were obtained (e.g. GPS unit, Google Maps) attes were obtained (e.g. GPS unit, Google M |
| Additional Information (Optional) Colony History: has this site been used in previous Colony History: has this site been used in previous Colony Length (lat, long coordinates in decimal) Provide colony site: Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash Max. number of dogs seen – off-leash Colonal notes (e.g. other threats, activities, sp | till the second | Open - Wet | b Vunknown If Yes, for how long?years bates were obtained (e.g. GPS unit, Google Maps) a;t bates were obtained (e.g. GPS unit, Google Maps) a;t bates boxes representing the dominant within a 200 m radius surrounding the colony bate of Young, successional bate of Young, successi |
| Additional Information (Optional) Colony History: has this site been used in previo Comments (has colony moved - how far, size ch Colony Length (lat, long coordinates in decimal) tart <u>N 46, 34133</u> • W 064, 51318 Ind <u>A meters</u> tart <u>N 46, 34133</u> • W 064, 51318 Ind <u>A meters</u> tart <u>N 46, 34133</u> • W 064, 51318 hoto of colony site: <u>P'</u> Yes No Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash Max. number of dogs seen – off-leash Mational notes (e.g. other threats, activities, sp | till the second | Yes □ Na GPS □ Check up habitat(s) Forested Open - Dry Open - Wet Human- | b Vunknown If Yes, for how long?years ates were obtained (e.g. GPS unit, Google Maps) att to 3 boxes representing the dominant within a 200 m radius surrounding the colony Voung, successional Mature Grassiand Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh - 5a/f Fen Bog Industrial Agricultural Residential |
| Additional Information (Optional) | till the second | Yes □ Na GPS □ Check up habitat(s) Forested Open - Dry Open - Wet Human- | b Vunknown If Yes, for how long?years bates were obtained (e.g. GPS unit, Google Maps) a;t bates were obtained (e.g. GPS unit, Google Maps) a;t bates boxes representing the dominant within a 200 m radius surrounding the colony bate of Young, successional bate of Young, successi |

Figure 51: Bank swallow survey for colony 2

| | | | | | 27 |
|---|---|--|---|---|--|
| BIRDS OISEAUX | Bank Swall | ow Colo | ny Reco | rd Form | 211 |
| ARADA (CONTART | | (if known): _ | | | 2 |
| Observer Details | | | | | 2 |
| Name: | Phone: | | | _ Email: | |
| Visit Details | | | | | |
| Date (dd-mm-yy):/07 | / 2020Start time (24h | r): 10:10 | End time (| 24hr): 10:45 Temp. | (°C): |
| Wind: Cloud Cover: _ | | | | | |
| # of birds: # of burn | | | | | lo |
| # of birds: # of burn | rows: 1-60 Colony | active (see n | everse jor di | escription, a res a | |
| Site and Habitat Details | | | | anal | - |
| Colony Location: N : 46-24 | 4121 W:64.51219 | - NS46,239 | 106 - With | 1.11 (lat, long coordinate | es in decimal degrees |
| Site Description (access, nea | arest community, land | owner detail | s): | | |
| and a decomposition of the | | | | | |
| | | | | | |
| Colony Habitat Type: Coa (check one box only) Gra | evel Pit 🖸 Sand Pit I | C Road Cut | Soil Pile | Other | - |
| Colony Habitat Type: Coa (check one box only) Gra Additional Information (Colony History: has this site Comments (has colony mov | evel Pit 🗆 Sand Pit I Optional) | C Road Cut | □ Soil Pile | Other | - |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cos Start 11:9(, 2010) 10:165 End N:9(, 2390) 10:165 | evel Pit □ Sand Pit I Optional) : been used in previous ved - how far, size char ordinates in decimal de 신도고19 6월, 19023 | s years? | Soil Pile | Unknown If Yes, fo <u>lected</u> from pa tes were obtained (e.g. G | or how long?yea Si PS unit, Google Map he dominant |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cos Start 1:54, 24(2) w : 58 | evel Pit □ Sand Pit I Optional) : been used in previous ved - how far, size char ordinates in decimal de 신도고19 6월, 19023 | s years? | Soil Pile | Unknown If Yes, fo Unknown If Yes, fo Ilected from po tes were obtained (e.g. G to 3 boxes representing t within a 200 m radius su Young, successional | or how long?yea Si PS unit, Google Map he dominant rrounding the colon |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cos Start <u>11:9(, 2002)</u> 11:55 End <u>N:9(, 2002)</u> 11:55 End <u>N:9(, 2002)</u> 12:55 Photo of colony site: □ Ye | ovel Pit Sand Pit Optional) been used in previous ved - how far, size char ordinates in decimal de 61,49023 es No | s years? | □ Soil Pile Yes □ No dub CO ow coordina Check up t habitat(s) | Unknown If Yes, fo | or how long?yea Si PS unit, Google Map he dominant rrounding the colon |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cos Start 11:9(, 2010) 10:165 End N:9(, 2390) 10:165 | ovel Pit Sand Pit Optional) been used in previous ved - how far, size char ordinates in decimal de 61,49023 es No | s years? | Check up t habitat(s) Forested | Other Unknown If Yes, fo Ilected from po tes were obtained (e.g. G o 3 boxes representing t within a 200 m radius su O Young, successional Mature Grassland | or how long?yea Si PS unit, Google Map he dominant rrounding the colon |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cod Start 11:9(, 2012) 1 1 1 4 End N:9(, 2012) 1 1 1 4 End N:9(, 2012) 1 1 1 4 Photo of colony site: □ Ye Breeding Evidence: [5] (see reverse for codes) | ovel Pit Sand Pit Optional) been used in previous ved - how far, size char ordinates in decimal de 61,49023 es No | Road Cut | Check up t habitat(s) | Other Unknown If Yes, fo Ilected from po tes were obtained (e.g. G o 3 boxes representing t within a 200 m radius su O Young, successional Mature Grassland Hayfield | or how long?yea |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long cos Start <u>1194</u> , 2000) 0011 Photo of colony site: □ Ye Breeding Evidence: [5] (see reverse for codes) Stewardship Indicator | avel Pit Sand Pit Optional) been used in previous ved - how far, size char ordinates in decimal de 61,49003 es No out | s years? | Check up t habitat(s) Forested | Other Unknown If Yes, fo Ilected from 20 tes were obtained (e.g. G o 3 boxes representing t within a 200 m radius su O Young, successional Mature Grassland Hayfield Pasture/grazing lan | or how long?yea |
| (check one box only) □ Gra Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long coo Start 1:90, 2003) 0:155 End N:90, 2003 0:15 Photo of colony site: □ Ye Breeding Evidence: □ Ye Breeding Evidence: □ Ye (see reverse for codes) Stewardship Indicator Proximity to rip rap/shore | avel Pit Sand Pit I Optional) | Road Cut | Check up t habitat(s) Forested | Other | or how long?yea |
| (check one box only) □ Gra Additional Information (i Colony History: has this site Comments (has colony mov Colony Length (lat, long cod Start 1:140, 24(2) Photo of colony site: Yee Breeding Evidence: (see reverse for codes) Stewardship Indicator Proximity to rip rap/shore Proximity to buildings (m) | avel Pit Sand Pit I Optional) | Road Cut | Check up t habitat(s) Forested | Other | or how long?yea |
| (check one box only) □ Gra Additional Information (C Colony History: has this site Comments (has colony mov Colony Length (lat, long cod Start 1:9(, 2002) 0:55 End N:9(, 2002) 0:55 End N:9(, 2002) 0:55 Photo of colony site: □ Ye Breeding Evidence: □ Ye | evel Pit Sand Pit I Optional) | Road Cut s years? | □ Soil Pile Yes □ No dulo CO ow coordina Check up t habitat(s) Forested Open - Dry Open - | Other O | or how long?yea |
| (check one box only) □ Gra Additional Information (C Colony History: has this site Comments (has colony mov Colony Length (lat, long coo Start 1:9(, 2002) 0:158 End N:9(, 2002) | een | Road Cut | Check up t habitat(s) Forested | Unknown If Yes, fo If Celed from 20 tes were obtained (e.g. G o 3 boxes representing t within a 200 m radius su Young, successional Mature Grassland Hayfield Pasture/grazing lan Cropland Abandoned croplar Marsh Fen | or how long?yea |
| (check one box only) □ Gra Additional Information (C Colony History: has this site Comments (has colony mov Colony Length (lat, long coo Start 1:90, 2002) 0:155 End N:90, 2002 Photo of colony site: □ Ye Breeding Evidence: □ Ye | een en - on-leash | Road Cut syears? mge): NO egrees) Ho | □ Soil Pile Yes □ No dub CO ow coordina Ow coordina Check up t habitat(s) Forested Open - Dry Open - Wet | Other | or how long?yea |
| (check one box only) □ Gra Additional Information (C Colony History: has this site Comments (has colony mov Colony Length (lat, long coo Start 11:9(, 2012) 11:55 End N:9(, 2012 | een en - on-leash | Road Cut s years? | □ Soil Pile Yes □ No dub Co ow coordina Ow coordina Check up t habitat(s) Forested Open - Dry Open - Wet Human- | Other | or how long?yea |
| (check one box only) □ Grad Additional Information (C Colony History: has this site Comments (has colony move Colony Length (lat, long costs Start 1::9(, 2010) Photo of colony site: Ye Breeding Evidence: (see reverse for codes) Stewardship Indicator Proximity to rip rap/shore Proximity to roads (m) Max. number of dogs see Max. number of dogs see | een en on-leash en off-leash | Road Cut syears? egrees) Ho u u u | □ Soil Pile Yes □ No dub CO ow coordina Ow coordina Check up t habitat(s) Forested Open - Dry Open - Wet | Other | or how long?yea |
| (check one box only) □ Gra Additional Information (C Colony History: has this site Comments (has colony mov Colony Length (lat, long coo Start 11:40, 24(24) 1 1 1 55 End N:40, 23(906 10 1 1) Photo of colony site: □ Ye Breeding Evidence: □ Ye | een en - on-leash en en leash en en leash en en leash en en leash en en en leash en en en leash en en en leash en en en leash | Road Cut syears? egrees) Ho u u u | □ Soil Pile Yes □ No dub Co ow coordina Ow coordina Check up t habitat(s) Forested Open - Dry Open - Wet Human- | Other | or how long?yea |

Figure 52: Bank swallow survey for colony 3

| (F | | | | 5.6 |
|--|-----------------------------------|--|--|----------------|
| Z | | | a state of the sta | 20 |
| BIRDS OISEAUX ANADA CANADA Bank Swal | | | rd Form | |
| | D (if known) | h | | |
| bserver Details | | | | |
| ame: Shallan Bay ublersted Phone: | | | Email: | - |
| | | | | |
| isit Details | 1.00 | N. | 1. O | |
| ate (dd-mm-yy): 22 /07 /2022 Start time (24) | hr): 10:1 | End time | 24hr): 11: 66 Temp. (°C): | - |
| /ind: Cloud Cover: Precipitation: | (56 | ee reverse for v | weather codes) | |
| | | | | |
| of birds: # of burrows: 71 Colony | active (see | e reverse for a | escription): La res El No | |
| ite and Habitat Details | | | | |
| | and know | | Still that loop coordinates in decima | al deorees |
| olony Location: NTEL 23929 WITH 1895 W | 142.2338 | 1 W . 64.18 | eri (lat, long coordinates in decime | a vegrees |
| ite Description (access, nearest community, land | lowner det | ails): | | |
| ne beschption (accus, near of a single a | | | | |
| | | | | |
| | | | | |
| check one box only) [] Gravel Pit [] Sand Pit | Li nodu et | | Liouici | |
| Additional Information (Optional) | | | | |
| Additional Information (Optional) | is years? | □Yes □ No | | |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length <i>(lat, long coordinates in decimal d</i> | is years? [nge): | □Yes □ No | | g? <u>ye</u> z |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length <i>(lat, long coordinates in decimal d</i> Start N244-03599 001 64 419975 | is years? [nge): | Yes No | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length <i>(lat, long coordinates in decimal d</i> Start N244-03599 001 64 419975 | is years? [nge): | Yes No | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>M:44-03:499 US: 64-91975</u> End <u>M:196-23:867 US: 64-91991</u> | is years? [nge): | Yes No How coordina Check up t habitat(s) | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go to 3 boxes representing the domina within a 200 m radius surrounding | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>11:44-03:499 Ust 64:49975</u> End <u>11:44-03:499</u> Ust 64:49975 | is years? [inge]: legrees] | Yes No How coordina Check up t habitat(s) | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go to 3 boxes representing the domina within a 200 m radius surrounding Young, successional | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>M:44,03:999 Up: 64,419975</u> End <u>M:446,03:999 Up: 64,419975</u> End <u>M:446,03:999 Up: 64,419915</u> Photo of colony site: I Yes I No Breeding Evidence: <u>N.</u> | is years? [inge]: legrees] | Yes No How coordina Check up t habitat(s) Forested | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>M:44,03:999 Up: 64,419975</u> End <u>M:446,03:999 Up: 64,419975</u> End <u>M:446,03:999 Up: 64,419915</u> Photo of colony site: I Yes I No Breeding Evidence: <u>N.</u> | is years? [inge]: legrees] | Yes No How coordina Check up t habitat(s) Forested Open - | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>N:44,03:999 Up; 64,419975</u> End <u>N:44,03:999 Up; 64,41941</u> Photo of colony site: I Yes I No Breeding Evidence: N | is years? [nge]: legrees) | Yes No How coordina Check up t habitat(s) Forested | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start 1994-03999 0016449975 End 1994-03999 0016449975 End 1994-03999 00164499975 End 1994-03999 00164999 End 1994-03999 001640 End 1994-03999 001640 End 1994-03999 End 1994-03999 001640 End 1994-03999 End 1994-0399 End 1994-0399 End 1994-03999 End 1994-0399 End 1994 | is years? [inge]: legrees] | Yes No How coordina Check up t habitat(s) Forested Open - | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start 1914, 03199 001 64,41975 End 1914, 03199 001 64,41941 Photo of colony site: Yes No Breeding Evidence: Yes No Breeding Evidence: Yes No Breeding Evidence: Yes No Stewardship Indicator Proximity to rip rap/shoreline hardening (m) | is years? [nge]: legrees) | Yes No How coordina Check up t habitat(s) Forested Open - | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start 11:44-03:493 101: 64,419975 End 11:346, 23:69 101: 64,419975 End 11:346, 24,419975 End 11:346, 24,41975 End 11:346, 24,41975 End 11:346, 24,41 | is years? [nge]: legrees) | Ves No How coordina Check up t habitat(s) Forested Open - Dry | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go to 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fit | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start 11:44-03:493 10:1:64,41975 End 11:349, 23:63 10:1:64,41975 End 11:349, 23:63 10:1:64,41997 Photo of colony site: Yes No Breeding Evidence: Yes No Breeding | is years? [inge]: iegrees) | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go to 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fit Marsh | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>1144-03499 Got 64,414975</u> End <u>1144-03499 Got 64,4144</u> Photo of colony site: Yes No Breeding Evidence: Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen | is years? [nge]: legrees) | Ves No How coordina Check up t habitat(s) Forested Open - Dry | Unknown If Yes, for how long tes were obtained <i>(e.g. GPS unit, Go</i> o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fit Marsh Fen | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start <u>M144-03494 Cost 64,444975</u> End <u>M144-03494 Cost 64,44491</u> Photo of colony site: □ Yes □ No Breeding Evidence: <u>M1,</u> (see reverse for codes) Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen - on-leash | is years? [inge]: iegrees) | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - Wet | Unknown If Yes, for how long tes were obtained <i>(e.g. GPS unit, Go</i> o 3 boxes representing the domina within a 200 m radius surrounding Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fit Marsh Fen Bog | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length <i>(lat, long coordinates in decimal d</i> Start <u>1244, 03499 cort 64, 414975</u> End <u>1244, 03499 cort 64, 41491</u> Photo of colony site: Yes No Breeding Evidence: No Breeding | is years? [inge]: iegrees) | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - Wet Human- | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Voung, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fit Marsh Fen Bog Industrial | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length (lat, long coordinates in decimal d Start 1974-03799 0016449975 End 1974-0379 Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen - on-leash Max. number of dogs seen - off-leash | egrees) # | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - Wet | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Voung, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fie Marsh Fen Bog Industrial Agricultural | g?yea |
| Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size cha Colony Length <i>(lat. long coordinates in decimal d</i> Colony Length <i>Length Length Lengt</i> | egrees) # | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - Wet Human- | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Voung, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fie Marsh Fen Bog Industrial Agricultural Residential | g?yea |
| Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash | egrees) # | Ves No How coordina Check up t habitat(s) Forested Open - Dry Open - Wet Human- | Unknown If Yes, for how long tes were obtained (e.g. GPS unit, Go o 3 boxes representing the domina within a 200 m radius surrounding Voung, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow fie Marsh Fen Bog Industrial Agricultural | g?yea |

Figure 53: Bank swallow survey for colony 4

3

| CANADA DISEAUX CANADA Bank Swallow C | olony Re | cord Form |
|---|---|---|
| Observer Details Colony ID (if know | wn): | |
| Name: Phone: | | Email: |
| Visit Details | | |
| Date (dd-mm-yy): 02 - 08 - 2027 Start time (24hr): 11 | 16 Kadala | 1004 10:000 m 24% |
| Wind: 1 Cloud Cover: 4 Precipitation: 0 | | |
| | | |
| # of birds: <u>40</u> # of burrows: <u>Colony active</u> (s | see reverse for | description): 🗹 Yes 🗆 No |
| Site and Habitat Details | | |
| Colony Location: | | lat long coordinates in derimal dearees |
| | | |
| Site Description (access, nearest community, landowner de <u>Private</u> <u>Property</u> | erans); | |
| Octan | | |
| | | |
| check one box only) 🗆 Gravel Pit 🗆 Sand Pit 🗆 Road C | | P Uther |
| Additional Information (Optional) | | |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony 5 and moved to the second | Bryes D No The coas | |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Sight moved to the and of Colony Length (lat, long coordinates in decimal degrees) tart N 46 33286 3 064 3 7423 | 면Ýes 디 Na he ceas How coordina Check up | o □ Unknown If Yes, for how long? <u>A</u> year <u>fal Bluff. Able quict Zpjotr [ui]</u> ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony 5 and moved to the second | E ^r Yes □ N h = ce a s How coordina Check up habitat(s) | O □ Unknown If Yes, for how long? A year A Bluff Adre guict Zpide [47] ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): <u>Colony Sight moved to the and at</u> Colony Length (<i>lat, long coordinates in decimal degrees</i>) itart <u>N 46 352 SCC 47 054 564 748</u> ? thoto of colony site: Q Yes Q No | 면Ýes 디 Na he ceas How coordina Check up | □ Unknown If Yes, for how long? A year Fall Bluff. Act council / provefur) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony □ Young, successional |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Sight moved to the and of Colony Length (lat, long coordinates in decimal degrees) tart N 46 33286 3 064 3 7423 | E ^r Yes □ N h = ce a s How coordina Check up habitat(s) | O Unknown If Yes, for how long? A year A Bluff All e guidt Zpide [u] ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony 5 ght moved how far, size change): Colony 5 ght moved has the and at Colony Length (lat, long coordinates in decimal degrees) that N 46 33 3 4 4 4 6 6 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 | ErYes □ N How coordina Check up habitat(s) Forested | □ Unknown If Yes, for how long? A year Fall Bluff. Act council / provefur) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony □ Young, successional |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony Sight moved how far, size change): Colony Sight moved has the and of Colony Length (<i>lat, long coordinates in decimal degrees</i>) that <u>N 46 35386° of 064 96748</u> ind <u>11 46 35386° of 064 96748</u> whoto of colony site: X Yes I No threeding Evidence: <u>ON</u> , <u>P</u> , <u>CF</u> ,, <u>M</u> see reverse for codes) Stewardship Indicator # | PYes □ No How coordina Check up habitat(s) Forested Open - | O Unknown If Yes, for how long? A year A Bluff. Adv c guich Zpide [ui] ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony O Young, successional Mature Grassland Hayfield |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony Sight moved how far, size change): Colony Length (lat, long coordinates in decimal degrees) tart N 46, 353, 26, 60, 36, 40, 74, 23 that 1, 46, 353, 26, 60, 36, 40, 74, 23 whoto of colony site: Yes whoto of colony site: Yes Stewardship Indicator # Proximity to rip rap/shoreline hardening (m) # | PYes □ No How coordina Check up habitat(s) Forested Open - | o □ Unknown If Yes, for how long? <u>A</u> year <u>fal</u> <u>Bhaff</u> . <i>More</i> <u>gravet</u> <u>/prorfar</u>] ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony □ Young, successional □ Mature ☑ Grassland |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony Sight Moved has the and at the construction of colony site: If yes I No Colony Evidence: ON _ P_ CF | PYes □ No How coordina Check up habitat(s) Forested Open - | O Unknown If Yes, for how long? A year A Bluff. More grund Zprorfull ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony Sight Moved has the and at the solory sight Moved has the solory sinted has the solory sight moved has the solor | PYes □ No How coordina Check up habitat(s) Forested Open - | O Unknown If Yes, for how long? A year A Bluff. More grund Zprorfull ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Voung, successional Mature Grassland Hayfield Pasture/grazing land Cropland |
| Additional Information (Optional) Solony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Sight Moved 1a the and at the solored for the so | Pres I No he coordina How coordina Check up habitat(s) Forested Open - Dry | o Unknown If Yes, for how long? A year (a) Bluff. More grund Zpice full ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field |
| Additional Information (Optional) Colony History: has this site been used in previous years? Colony Sight Moved how far, size change): Colony Sight Moved how far, size change): Colony Sight Moved how far, size change): Colony Length (lat, long coordinates in decimal degrees) tart N 46 Ind 11 11 45 Stevardship Indicator # Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash # | Pres D No he coas How coordina Check up habitat(s) Forested Open - Dry Open - | Unknown If Yes, for how long? A year In the second secon |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Length (lat, long coordinates in decimal degrees) itart | Pres I No he coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet | o Unknown If Yes, for how long? A year fal Bluff: More grant / proceful) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Ø Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony 5 ght moved to the and to the second degrees) Colony Length (lat, long coordinates in decimal degrees) Stewardship Indicator # Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of poople seen <t< td=""><td>Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human-</td><td>o Unknown If Yes, for how long? A year A Bluff: More grant / proceful) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog Industrial</td></t<> | Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | o Unknown If Yes, for how long? A year A Bluff: More grant / proceful) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog Industrial |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Sight Moved Ya + he and at Colony Length (lat, long coordinates in decimal degrees) Stewardship Indicator # Proximity to rip rap/shoreline hardening (m) # Proximity to roads (m) # Max. number of people seen # Max. number of dogs seen - onf-leash # Max. number of dogs seen - off-leash # dditional notes (e.g | Pres I No he coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet | Unknown If Yes, for how long? A year Diuff. More grant / proof / proof (ur) ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog Industrial Agricultural |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony 5 ght moved to the and to the second degrees) Colony Length (lat, long coordinates in decimal degrees) Stewardship Indicator # Proximity to rip rap/shoreline hardening (m) Proximity to roads (m) Max. number of poople seen <t< td=""><td>Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human-</td><td>Unknown If Yes, for how long? A year Unknown If Yes, for how long? A year If the second of the second</td></t<> | Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | Unknown If Yes, for how long? A year Unknown If Yes, for how long? A year If the second of the second |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Length (lat, long coordinates in decimal degrees) Cat N Colony Length (lat, long coordinates in decimal degrees) Cat N Cat N Colony Length (lat, long coordinates in decimal degrees) Cat N Cat N Colony Length (lat, long coordinates in decimal degrees) Cat N Proximity to rip rap/shoreline hardening (m | Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- made | Unknown If Yes, for how long? A year Diaff. Marc guict / pide fuil ates were obtained (e.g. GPS unit, Google Maps to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog Industrial Agricultural Residential Commercial |
| Additional Information (Optional) Colony History: has this site been used in previous years? Comments (has colony moved - how far, size change): Colony Sight Moved Ya + he and at Colony Length (lat, long coordinates in decimal degrees) Stewardship Indicator # Proximity to rip rap/shoreline hardening (m) # Proximity to roads (m) # Max. number of people seen # Max. number of dogs seen - onf-leash # Max. number of dogs seen - off-leash # dditional notes (e.g | Pres I No How coordina How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- made | Unknown If Yes, for how long? A year Unknown If Yes, for how long? A year If the second of the second |

Figure 54: Bank swallow survey for colony 5

| No. Company | | | |
|--|--|--|--|
| BIRDS OISEAUX ANADA Bank Swal | | lony Reco | |
| Observer Details | | / | - |
| Name: Gloce, Chat, Marino, End Phone: | - | | Email: |
| /isit Details | | | |
| Date (dd-mm-yy): 3 - 08- 2022 Start time (24) | hr): | End time | (24hr):Temp. (*C): 34*C |
| Wind: 1 Cloud Cover: 4 Precipitation: | 0 (5 | ee reverse for | weather codes) |
| of birds:# of burrows:Colony | active (se | e reverse for a | description): 🗆 Yes 🛛 🛱 No |
| Site and Habitat Details | | | |
| Colony Location: N 46 33389 W | 0546 | ,0004° | (lat, long coardinates in decimal degrees |
| Site Description (access, nearest community, land | lowner de | tails): | |
| | | | |
| (check one box only) | Road Ci syears? | ut 🗆 Soil Pik | e 🗆 Other |
| (check one box only) 		Gravel Pit 		Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chai | Road Ci syears? [nge]: | ut 🗆 Soil Piłł | e □ Other o ⊠ Unknown If Yes, for how long?yea |
| (check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size char Colony Length (lat, long coordinates in decimal deci | Road Ci syears? [nge]: egrees) | ut 🗆 Soil Piłł | e 🗆 Other |
| (check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size char Colony Length (lot, long coordinates in decimal do Start | Road Ci syears? [nge]: egrees) | ut Soil Pik | e Other |
| (check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size char Colony Length (lot, long coordinates in decimal do Start | Road Ci syears? [nge]: egrees) | UYes IN No | e Other |
| (check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size char Colony Length (lat, long coordinates in decimal definition) Start End | Road Ci syears? [nge]: egrees) | UYes D No How coordina Check up habitat(s) | e Other o d Unknown If Yes, for how long?yea ates were obtained (e.g. GPS unit, Google Map to 3 boxes representing the dominant within a 200 m radius surrounding the colony |
| (check one box only) □ Gravel Pit □ Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal defection) Start End Photo of colony site: ☑ Yes □ No | Road Ci regrees) | UYes D No How coordina Check up habitat(s) | e Other |
| Interference Image: Stand Pit Image: Stand Pi | Road Ci regrees) | UYes ING How coordina Check up habitat(s) | e Other |
| Check one box only) □ Gravel Pit □ Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal) Start End Photo of colony site: ☑ Yes In No Breeding Evidence: | Road Ci regrees) | UYes IN How coordina Check up habitat(s) Forested Open - | e Other |
| Check one box only) □ Gravel Pit □ Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal Start End Photo of colony site: ☑ Yes Ind Start (see reverse for codes) | Road Ci syears? [grees] | UYes ING How coordina Check up habitat(s) | e Other |
| Check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal for the start | Road Ci regrees) | UYes IN How coordina Check up habitat(s) Forested Open - | e Other |
| Check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chail Colony Length (lat, long coordinates in decimal decimal decimal) Colony Length (lat, long coordinates in decimal decimal) Photo of colony site: Yes No Breeding Evidence: | Road Ci syears? [grees] | UYes IN How coordina Check up habitat(s) Forested Open - | e Other |
| Check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal for the start | Road Ci syears? [grees] | UYes IN How coordina Check up habitat(s) Forested Open - | e Other |
| Indext one box only Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal) Colony Length (lat, long coordinates in decimal decimal) Photo of colony site: Yes No Breeding Evidence: | Road Ci syears? [grees] | UYes INA | e Other |
| Indext one box only Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal decimal decimal) Colony Length (lat, long coordinates in decimal decimal) Photo of colony site: Yes No Breeding Evidence: | Road Ci syears? [grees] | UYes INA | e Other |
| (check one box only) Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal distant End Photo of colony site: Yes No Breeding Evidence: | Road Ci syears? [grees] | UYes INA | e Other |
| Indext one box only Gravel Pit Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chail Colony Length (lat, long coordinates in decimal defection) Colony Length (lat, long coordinates in decimal defection) Photo of colony site: Yes No Breeding Evidence: | Road Ci is years? 1 inge): egrees) # | U Yes D No How coordina Check up habitat(s) Forested Open - Dry Open - Wet | e Other |
| (check one box only) □ Gravel Pit □ Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal de Start End Photo of colony site: □ Yes. □ No Breeding Evidence: | Road Ci is years? 1 inge): egrees) # | U Yes D No How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | e Other |
| (check one box only) □ Gravel Pit □ Sand Pit Additional Information (Optional) Colony History: has this site been used in previou Comments (has colony moved - how far, size chain Colony Length (lat, long coordinates in decimal de Start End Photo of colony site: □ Yes. No Breeding Evidence: | Road Ci is years? 1 inge): egrees) # | U Yes D No How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | e Other |
| Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) Proximity to roads (m) Max. number of people seen Max. number of dogs seen – on-leash Max. number of dogs seen – off-leash Additional notes (e.g. other threats, activities, sp | Road Ci is years? 1 inge): egrees) # | U Yes D No How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | e Other |

Figure 55: Bank swallow survey for colony 6

| 1 | | and the second | |
|---|---|--|------|
| BIRDS OISEAUX NADA Bank Swall | ow Colony R | ecord Form | |
| Colony ID | (if known): | | |
| bserver Details | | Email: | |
| ame: Phone: | | Enion | - |
| isit Details | | 2/15 31% | |
| ate (dd-mm-yy): 04 /08 /1034 Start time (24h | r): 2:30 End t | time (24hr): 2.99 Temp. (*C): 97-C | |
| And a Cloud Cover: 1_ Precipitation:_ | 0 (see reverse | e for weather codes) | |
| of birds: _ 2_ # of burrows: _ 46_ Colony | active (see reverse | for description): Ves 🗆 No | |
| | | | |
| along location: Grande - Digen , | Caissil - | (lat, long coordinates in decimal degree | ees) |
| te Description (access, nearest community, land | owner details): | | - |
| brach | | | - |
| | | and the second sec | |
| Additional Information (Optional) | □ Road Cut □ So | | - |
| Colony History: has this site been used in previous | syears? Byes | | ean |
| Additional Information (Optional) | s years? ⊠Yes □ | I No 디 Unknown If Yes, for how long? <u>구</u> | - |
| Colony History: has this site been used in previous Colony History: has this site been used in previous Comments (has colony moved - how far, size char (CSS 6, CSS) | s years? Yes and cut is so | | - |
| Colony Length (lat, long coordinates in decimal definitional langer of the langer of t | s years? BYes D nge): egrees) How coo | I No 디 Unknown If Yes, for how long? 그 | - |
| Colony Length (lat, long coordinates in decimal definitional langer of the langer of t | s years? EYes E nge): Sgrees) How coo | NO Unknown If Yes, for how long? | laps |
| Colony Length (lat, long coordinates in decimal distance) Colony Length (lat, long coordinates) Colony Length (lat, long coor | s years? EYes E nge): Sgrees) How coo | NO Unknown If Yes, for how long? | laps |
| check one box only) \Box Gravel Pit \Box Sand Pit additional Information (Optional) colony History: has this site been used in previous comments (has colony moved - how far, size char (255 6) 25 Colony Length (lot, long coordinates in decimal do Start <u>W 4635285</u> W 064 End <u>W 4636455</u> W 064 | Road Cut So syears? Eyes agrees) How coo 597743 Chec habit | NO Unknown If Yes, for how long? A your of the second state of the | laps |
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| check one box only) Gravel Pit Sand Pit additional Information (Optional) colony History: has this site been used in previou: comments (has colony moved - how far, size chain (c55 colony Length (lat, long coordinates in decimal distant M 46 colony Length (lat, long coordinates in decimal distant M 46 colony Length (lat, long coordinates in decimal distant M 46 colony Length (lat, long coordinates in decimal distant M 46 photo of colony site: Yes Photo of colony site: Yes Stewardship Indicator Proximity to rip rap/shoreline hardening (m) Proximity to buildings (m) | s years? EYes E sgrees) How coo 597793 Chec habit Fores Diper Dry | No Unknown If Yes, for how long? A show the second | laps |
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Figure 56: Bank swallow survey for colony 7

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| BIRDS OISEAUX CANADA CANADA | Bank Swallow | Colony Rec | |
|---|---|--|--|
| Observer Details | considering for the state | | |
| Name: | Phone: | | Email: |
| Visit Details | | | |
| Date (dd-mm-yy): 04/08 | 8/2010Start time (24hr): 3 | CO End time | (24hr): 3:15 Temp. (*C): 31 °C |
| Wind: A Cloud Cover: | 1 Precipitation: 0 | (see reverse for | weather codes) |
| | | | description): Pyes D No |
| Site and Habitat Details | | | |
| Colony Location: _ Grant | de-Dique / caissie | - Cape | (lat, long coordinates in decimal degrees) |
| Site Description (access, nei | arest community, landowne | r details): | |
| bruch | | | |
| Additional Information (| Optional) been used in previous year | si gives 🗆 No | e □ Other |
| Additional Information (Colony History: has this site Comments (has colony mov 2005 6.725 Colony Length (lat, long coc Start 1/ 46.3630/ V | Optional) been used in previous year ved - how far, size change): _ ordinates in decimal degrees V 064 . 54881 _ | s7 SYes D No | D Unknown If Yes, for how long? 그 year |
| Additional Information (Colony History: has this site Comments (has colony mov 2005 Bird S Colony Length (lat, long cod Start N 46.3630) V End Di Him 6 Met | Optional) been used in previous year ved - how far, size change): _ ordinates in decimal degrees V 064 . 54881 P | s7 GYes D No How coordina | □ Unknown If Yes, for how long? _ years stes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant |
| Additional Information (Colony History: has this site Comments (has colony mov 2005 6.7725 Colony Length (lat, long cod Start 10 46.3630) V End 5.74.8 6 MC | Optional) been used in previous year ved - how far, size change): _ ordinates in decimal degrees V 064 . 54881 P | s7 9Yes D No How coordina Check up thabitat(s) | D □ Unknown If Yes, for how long? tes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant within a 200 m radius surrounding the colony |
| Additional Information (Colony History: has this site Comments (has colony mov (255 6.725 Colony Length (lat, long cod Start <u>10 46 3650</u> 0 End <u>61 46 3650</u> 0 Photo of colony site: 0 Ye | Optional) e been used in previous year ved - how far, size change): ordinates in decimal degrees N 064 . 54881 CS S □ No | s7 9Yes D No How coordina Check up thabitat(s) | □ Unknown If Yes, for how long? _ years stes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant |
| Additional Information (Colony History: has this site Comments (has colony mov 235 6.0725 Colony Length (lat, long coc Start <u>11 46.36301 V</u> End <u>61.16.8501 V</u> End <u>61.16.8501 V</u> Photo of colony site: 27 Ye Breeding Evidence: <u>ON</u> , | Optional) e been used in previous year ved - how far, size change): ordinates in decimal degrees N 064 . 54881 CS S □ No | s7 9Yes D No How coordina Check up thabitat(s) | D □ Unknown If Yes, for how long?years stes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant within a 200 m radius surrounding the colony □ Young, successional |
| Additional Information (Colony History: has this site Comments (has colony mov 2000 Length (lat, long coc Start 1/46.3630/9 End 00:16.0 0 44 Photo of colony site: 10 Ye Breeding Evidence: 0N, (see reverse for codes) | Optional) been used in previous year ved - how far, size change): ordinates in decimal degrees N 064 . 54883 ECS ■ No | s7 9 Yes D No How coordina Check up thabitat(s) Forested Open - Dry | to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Y Grassland Hayfield |
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| Additional Information (Colony History: has this site Comments (has colony mov Cess 6.37 d S Colony Length (lat, long coc Start <u>M 46.36301 W</u> End <u>W 46.36301 W</u> En | Optional) been used in previous year ved - how far, size change):_ ordinates in decimal degrees V 064 . 54881 CS s □ No #line hardening (m) | S7 9/Yes □ No How coordina Check up habitat(s) Forested Open - Dry | Unknown If Yes, for how long? Q years tes were obtained (e.g. GPS unit, Google Maps) to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land |
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| Additional Information (Colony History: has this site Comments (has colony mov Colony Length (lat, long coc Start <u>M 46.3650</u> W End <u>50:14:8 5 MC</u> Photo of colony site: S Ye Breeding Evidence: <u>ON</u> , (see reverse for codes) Stewardship Indicator Proximity to rip rap/shore Proximity to buildings (m) Proximity to roads (m) Max. number of people see Max. number of dogs seen | Optional) e been used in previous year. ved - how far, size change): ordinates in decimal degrees 064 . 54881 *C3 es No # Hine hardening (m) een n - on-leash | s7 9/Yes D No How coordina habitat(s) Forested Open - Dry Open - | Unknown If Yes, for how long? Q years tes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh |
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| Additional Information (Colony History: has this site Comments (has colony mov 2005 Colony Length (lat, long cod Start <u>M 46.3630</u> W End <u>Within 6 Met</u> Photo of colony site: Ve Breeding Evidence: <u>ON</u> , (see reverse for codes) Stewardship Indicator Proximity to rip rap/shore Proximity to roads (m) Max. number of people se Max. number of dogs seen Max. number of dogs seen | Optional) e been used in previous year. ved - how far, size change): ordinates in decimal degrees > 064 . 54881 # *C3 *C3 # time hardening (m) # n - on-leash n - off-leash | s7 9Yes I No How coordina Check up habitat(s) Forested Open - Dry Open - Wet Human- | Unknown If Yes, for how long? Q years tes were obtained (e.g. GPS unit, Google Maps, to 3 boxes representing the dominant within a 200 m radius surrounding the colony Young, successional Mature Y Grassland Hayfield Pasture/grazing land Cropland Abandoned cropland/fallow field Marsh Fen Bog Industrial Agricultural |
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Figure 57: Bank swallow survey for colony 8

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