2022

IMPLEMENTATION REPORT:

MULTI-SPECIES ACTION PLAN for Kouchibouguac National Park of Canada (2016-2021)

Parks Canada Parcs Canada

Canada

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[1] http://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Preface

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996)[2] agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the Species at Risk Act (S.C. 2002, c.29) (SARA), action plans outline measures that will be taken to implement recovery strategies for SARA-listed Extirpated, Endangered and Threatened species. Parks Canada's multi-species action plans address a suite of species of conservation concern within one or more Parks Canada managed areas, including species that require an action plan under SARA.

The Minister responsible for the Parks Canada Agency (the Minister of the Environment and Climate Change) is the competent minister under SARA for species found in Kouchibouguac National Park of Canada, and in 2016 published the Multi-species Action Plan for Kouchibouguac National Park of Canada.

Under section 55 of SARA, the competent minister must monitor the implementation of an action plan and the progress towards meeting its objectives, and assess and report on its implementation and its ecological and socio-economic impacts five years after the action plan comes into effect. A copy of the report must be included in the Species at Risk Public Registry. The Minister responsible for the Parks Canada Agency has prepared this Implementation Report: Multi-species Action Plan for Kouchibouguac National Park of Canada (2016-2021).

The achievement of population and distribution objectives identified within the recovery strategy or management plan for a species may require a long time frame. In these cases, a five-year reporting window may not be sufficient to show demonstrable progress towards meeting site-based population and distribution objectives identified for that species within a Parks Canada site-based action plan. Parks Canada monitors, evaluates and, as necessary, adapts measures taken to achieve species survival or recovery, and will report on progress towards meeting site-based population and distribution objectives every five years.

[2] http://www.canada.ca/en/environment-climate-change/services/species-risk-act-accord-funding.html#2

Acknowledgments

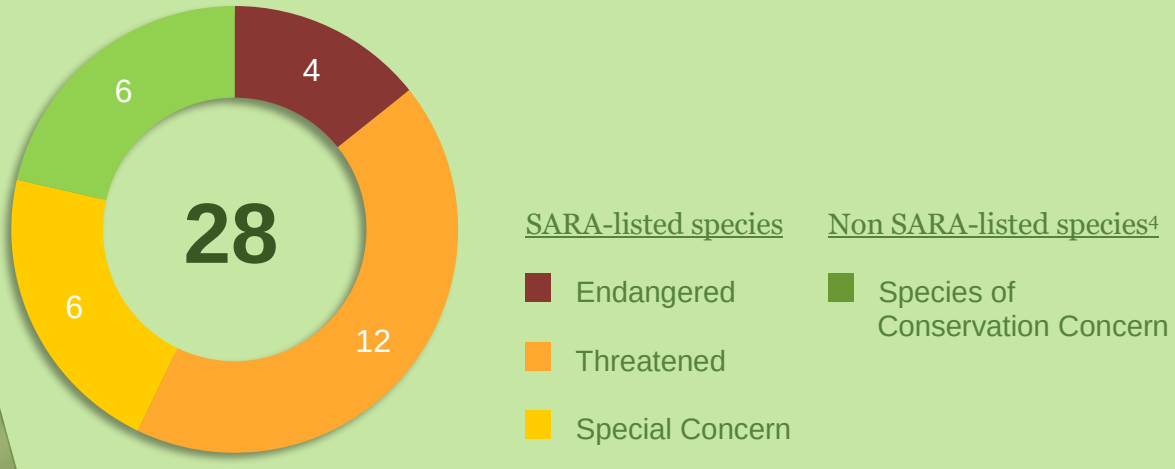
Parks Canada would also like to acknowledge those who have contributed to the implementation of the Multi-species Action Plan for Kouchibouguac National Park of Canada. Thanks are extended to: Jen Rock (Canadian Wildlife Service, Environment and Climate Change Canada), Nicolas Lecomte (Canada Research Chair in Polar and Boreal Ecology, Université de Moncton), Sean Blaney and David Mazerolle (Atlantic Canada Conservation Data Centre), Dave Mcruer (Parks Canada and Atlantic Veterinary College, University of Prince Edward Island), Christian Lacroix (University of Prince Edward Island), Donnie McPhee (National Tree Seed Centre), Kurt Samways (Parks Canada Chair in Aquatic Restoration, University of New Brunswick), Scott Pavey (University of New Brunswick), Mike Rushton (Les Amis de la Kouchibouguacis), Hugh Broders (Saint Mary's University), as well as Abby Lewis and Lori Phinney (Mersey Tobeatic Research Institute).

EXECUTIVE SUMMARY

This document reports on implementation of the Multi-species Action Plan for Kouchibouguac National Park of Canada between 2016 and 2021. It reports on implementation of measures identified in the plan, assesses progress towards meeting site-based population and distribution objectives, and evaluates socio-economic impacts.

Species Addressed[3]

The action plan addressed 22 SARA-listed species and 6 species of conservation concern. Measures and site-based population and distribution objectives identified within the action plan were focused on 9 species, for which management actions within Kouchibouguac National Park could have a substantive impact on survival or recovery: Piping Plover (melodus subspecies), Gulf of St. Lawrence Aster, Beach Pinweed (subcylindrica variety), Wood Turtle, Atlantic Salmon (southern Gulf of St. Lawrence population), Bobolink, Eastern Meadowlark, Short-Eared Owl and Barn Swallow.



[3] The SARA-listing classifications for the species in this report may differ from the Multi-species Action Plan due to changes made to Schedule 1 of the *Species at Risk Act* since the action plan was published.
[4] Including non SARA-listed species of conservation concern (COSEWIC assessed, provincially listed, culturally significant species) in addition to SARA listed species provides the Parks Canada Agency with a comprehensive plan for species conservation and recovery at the site.

Implementation of the Action Plan

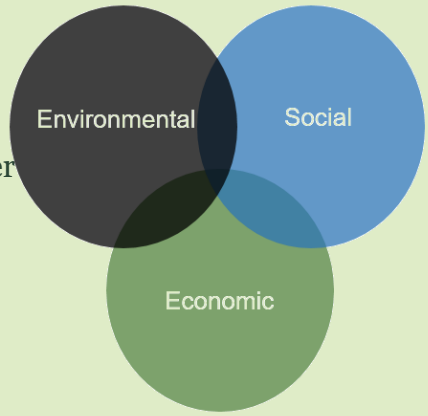
10 measures (recovery actions) were identified in the multi-species action plan. Implementation of the action plan is assessed by determining progress towards completing each measure, and is outlined in Section 2 of this report. During the five-year period, all 10 measures were initiated[5] and 9 were completed. An additional 13 measures identified in the action plan were initiated (12 of them completed) because resources and/or partnerships became available to support the work.

Ecological Impacts

9 site-based, population and distribution objectives (PDOs) were developed in the action plan. Ecological impacts are assessed by measuring progress towards achieving each of the site-based population and distribution objectives and are outlined in Section 4. Progress was made on all objectives[6] including 8 that were fully achieved

Socio-Economic Impacts

Direct costs of implementing this action plan were borne by Parks Canada. Indirect costs were mostly visitor access restrictions to protect piping plovers, Gulf of St. Lawrence Aster and Beach Pinweed. Benefits included improved ecological integrity and increased visitor awareness of species at risk and conservation efforts in the park.



[5] Includes measures that are 100% completed
[6] Includes PDOs that are fully achieved

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1. CONTEXT

This document reports on implementation of the Multi-species Action Plan for Kouchibouguac National Park of Canada[7] between 2016 and 2021, assesses progress towards meeting its population and distribution objectives, and evaluates its socio-economic impacts. It addresses 28 species, including 17 SARA-listed Endangered and Threatened species (for which an action plan is required) as well as 5 SARA-listed Special Concern species[8]. Although not a SARA-listed species, Atlantic Salmon (Gaspé-Southern Gulf of St. Lawrence population) is included in this action plan as it is a culturally significant species for the Mi'kmaq of Sigenigteoag.

Site-based population and distribution objectives were developed for 9 species for which implementation measures within Kouchibouguac National Park could have a substantive impact on recovery at a national, regional or site level: Piping Plover (melodus subspecies), Gulf of St. Lawrence Aster, Beach Pinweed (subcylindrica variety), Wood Turtle, Atlantic Salmon (southern Gulf of St. Lawrence population), Bobolink, Eastern Meadowlark, Short-eared Owl and Barn Swallow.

2. IMPLEMENTATION OF THE ACTION PLAN

Implementation of the Multi-Species Action Plan for Kouchibouguac National Park of Canada is assessed by measuring progress towards completing the recovery measures identified in the action plan (Table 1). Refer to the original action plan for a description of each measure, the desired outcomes, and the threat(s) that each measure addresses. A more detailed description of the implementation of some of the measures is outlined in Appendix A.

In 2020 there were several restrictions put in place at Kouchibouguac National Park to combat the spread of COVID-19. While there were temporary restrictions on park management activities, this had a negligible impact on the park's ability to implement its action plan.

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[7] Parks Canada Agency. 2016. Multi-Species Action Plan for Kouchibouguac National Park of Canada and associated National Historic Sites of Canada. *Species at Risk Act* Action Plan series. Parks Canada Agency, Ottawa. V + 20 pp. https://www.sararegistry.gc.ca/virtual_sara/files/plans/Ap-Kouchibouguac-v00-2016Nov22-Eng.pdf

[8] The status of these species may have changed over the reporting period.

Table 1. Progress towards completing recovery measures committed to by Kouchibouguac National Park and associated National Historic Sites (* indicates an ongoing measure that may continue into a future multi-species action plan).

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
1) Piping Plover (melodus): Interpretive panels and signage to promote compliance with mitigation measures (e.g., dogs on leash) and area closures in the vicinity of nests to redirect visitors to nearby open beaches, where required.	Maintain a level of protection sufficient to ensure successful breeding of the species (slight change from outcome initially described in the action plan).	Signage was installed each year from 2016 to 2021 to protect nesting piping plovers and promote compliance. In winter 2020, the signs were re-designed to clarify prohibited activities in barrier sand dune habitats. The new signs were produced and deployed starting with the 2021 breeding season.	100%*
2) Piping Plover (melodus): Control of Red Fox (*Vulpes vulpes*) on South Kouchibouguac Dune using humane wildlife control techniques.	Improve breeding rates and fledgling success at South Kouchibouguac Dune (slight change from outcome initially described in the action plan).	Predator control was applied until 2016 and reinstated in 2019 after their re-establishment on South Kouchibouguac Dune. Piping plovers are now nesting again on the dune yearly.	100%*
3) Gulf of St. Lawrence Aster: Reduce disturbance to potential Gulf of St. Lawrence Aster areas and critical habitat: Minimize human traffic on dune and salt marsh vegetation. Investigate opportunity of	Natural regeneration of the species.	Sites where the species once existed were assessed and monitored for protection. A population reintroduction project was designed and submitted to the Parks Canada Agency's Conservation and Restoration funding program in 2015 and funding was secured for implementation to start in 2016.	100%*

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
reintroduction based on the favorable results obtained at Prince Edward Island National Park.		Results of the project is described in appendix A.	
4) Beach Pinweed: Reduce disturbance to Beach Pinweed areas: Minimize human traffic on the dune vegetation.	Mitigation of anthropogenic disturbance of Beach Pinweed and its habitat (slight change from outcome initially described in the action plan).	Visitors are prohibited to walk on any vegetated portion of the park's dunes. Trampling of Beach Pinweed and its habitat was further minimized through active promotion of compliance (direct contact with visitors), interpretive signage and programs outlining the fragility of coastal ecosystems.	100%*
5) Wood Turtle: Improve Wood Turtle habitat connectivity and reduce road mortality on Highway 117.	Install two Wood Turtle crossings on Highway 117 located within Wood Turtle critical habitat.	The two wildlife tunnels and associated fencing manufactured by ACO Canada were installed along route 117 in 2015. This goal was thus identified and reached as the plan was still being developed and not yet on the public registry.	100%
6) Little Brown Myotis and Northern Myotis: Bat inventory: Assess distribution and relative abundance of bats in KNP using digital ultrasonic activity recorders.	Distribution and relative abundance of bat species in KNP is understood and a long-term bat monitoring protocol is implemented.	Ultrasonic equipment was acquired and a bat occurrence survey was developed and implemented in 2015 and 2016. The data obtained was analysed and the status of each bat species in the park was updated in a completed report.	100%
7) Little Brown Myotis and Northern Myotis: Bat Best Management Practices: Implement Best Management Practices for	Bat Best Management Practices implemented.	From 2016 to 2021, the best management practice developed by Fundy National Park for managing bats in buildings was implemented in the Northern New Brunswick Field Unit. All renovated or destroyed	100%*

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
maintenance of infrastructure used by roosting bats.		structures were first inspected for signs of use by bats. To date, no signs of bat use were found in the park's infrastructure.	
8) Barn Swallow: Barn Swallow Best Management Practices: Develop and implement Best Management Practices for maintenance of infrastructure used by nesting birds.	Maintain monitoring of the colony present at Cap St. Louis wharf.	The following documents have since been developed by Parks Canada, with their finalisation contingent on pending updates to the Migratory Birds Regulations: 1) Parks Canada National Best Management Practices Minimizing Impacts to Migratory Birds During the Nesting Period, 2) Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period, 3) Guidance on the Management and Protection of Barn Swallow Nests in Parks Canada Places and 4) Proposed Decision Tree for Allowing Removal of Barn Swallow Nests or Construction Near Active Nests. The park is monitoring the colony to confirm their presence each year during the nesting season and is applying these guidelines to manage sites used by Barn Swallow.	100%*
9) Bank Swallow: Inventory of known and potential suitable habitat. Thereafter annual monitoring.	Annual monitoring of known colonies and identification of new sites in relation to coastal zone changes.	The bank swallow survey was developed and implemented in 2019. In 2020, it was cancelled due to the COVID-19 pandemic. The park resumed the annual bank swallow survey in 2021.	100%*
10) Bobolink, Eastern Meadowlark and Short-eared Owl: Vegetation Best Management	A protected and productive population of nesting grassland birds (Bobolink) in National Historic Sites of	Considerable work has been done to establish best practices and approaches to vegetation management through Basic Impact Assessment work done for the National	50%*

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
Practices: Develop and implement Best Management Practices for the conservation of nesting grassland birds in National Historic Sites.	Northern New-Brunswick Field Unit.	Historic Sites of Grand Pré, Beaubassin and Fort Beauséjour. For example, vegetation harvest is now postponed until August to allow birds to finish nesting. The next step will be to finalise practices in the form of a Best Management Practices document.	

Additional measures were identified in the action plan that would be beneficial to complete should resources become available. Table 2 describes the actions that Kouchibouguac National Park was able to initiate between 2016 and 2021. Measures from the action plan that were not initiated will be carried forward for consideration in a revised action plan.

Table 2. Progress towards completing additional recovery measures implemented because partnerships and/or resources became available (progress is influenced by the amount of funding / support received); * indicates an ongoing measure that may continue into a future action plan.

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
11) Piping Plover (melodus): Provide expertise and logistical support to First Nations, NGOs and other partners to	Partners outside the park engaged in recovery efforts.	Logistical support was offered and given when needed to regional volunteers and NGO's that monitor plovers outside the park in the region.	100%*

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
support recovery in areas adjacent to the park.			
12) Gulf of St. Lawrence Aster: Inventory of suitable potential habitat with Atlantic Canada Conservation Data Centre (ACCDC).	Find new potential habitat for Gulf of St. Lawrence Aster.	Inventory of suitable habitat was conducted in 2016 and 2017, based on prior observations, aerial imagery, and field surveys. See appendix A for more information.	100%
13) Gulf of St. Lawrence Aster: Explore feasibility of artificial propagation and introduction to suitable habitat in KNP (with University of Prince Edward Island and other interested partners).	Restoration of population in suitable habitat.	The park applied for and secured funding (Conservation and Restoration program) for this reintroduction project and it was implemented starting in 2016. Yearly monitoring of reintroduction sites has been conducted from 2016 to 2021.	100%*
14) Beach Pinweed: Contribute to a national seed bank.	National seed bank has contribution from KNP.	Beach Pinweed seeds were submitted in 2019 and 2020 to the National Tree Seed Centre located at the Canadian Forest Service-Atlantic Forestry Centre in Fredericton, New Brunswick. Several seed lots for Beach Pinweed are now preserved at the centre.	100%
15) Wood Turtle: Pilot project for new survey methods (conservation dogs) in collaboration Dalhousie University,	Evaluate survey technique for location of turtles and nests.	A wood turtle restoration project was developed involving comparative methods such as conservation dogs and eDNA, and an application was submitted to Parks Canada's Conservation and Restoration	25%

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
Metepenagiag First Nation and New Brunswick Department of Natural Resources or eDNA.		funding program in 2020. The application was not successful. Also, preliminary tests with eDNA were unsuccessful. We will continue to explore alternative methods to help restore Wood Turtle populations.	
16) Atlantic Salmon – Gaspé-Southern Gulf of St. Lawrence population: Stock enhancement at Black River and Fontaine River in collaboration with Fisheries and Ocean Canada.	Installation of 10 protective incubation trays populated with fertilized Atlantic Salmon eggs in park watersheds (slight change from outcome initially described in the action plan).	In 2019 and 2020, during the course of an ongoing 5-year multi-park Atlantic Salmon population restoration project funded through the Agency's Conservation and Restoration funding program, the park deployed incubation trays yearly. A total of 10,589 and 9,464 fertilized eggs have been placed so far in Rankin and Black rivers, respectively. The project is ongoing and now also includes partners in the Greater Kouchibouguac Ecosystem such as Les Amis le Kouchibouguacis deploying trays in Kouchibouguac and Kouchibouguacis rivers, and Kopit Lodge doing the same in Richibucto River.	100%
17) Atlantic Salmon – Gaspé-Southern Gulf of St. Lawrence population: Provide expertise to First nations and nongovernmental organisation partners for the recovery of the species outside the park. Atlantic Salmon population	Monitoring and enhancement in Richibucto and Kouchibouguacis rivers.	The park supported the development of a 5-year Atlantic Salmon restoration project in the Richibucto River with its indigenous partner Kopit Lodge. The park assisted Kopit Lodge with project design and a funding application to Fisheries and Oceans Canada's coastal restoration fund in the winter of 2016-17. The park offered	100%

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
assessment for Richibucto and Kouchibouguacis Rivers. Stock enhancement.		logistical support to the project (material, human resources) from 2017 to 2021.	
18) Implement urban outreach targeting young families and youth: Implement species at risk awareness activities in urban outreach.	Increase by 5% the number of direct or facilitated contacts with Canadians outside of KNP compared to 2014.	The park deployed an urban outreach mobile kiosk at several events on a yearly basis, except in 2020 and 2021 due to the pandemic. Educational materials such as postcards, info sheets and macaron-pins were developed and distributed to the public from the kiosk. Through these measures the park was able surpass the goal of increasing contacts with the public by 5%.	100%
19) Implement a traditional and social media communications strategy: Develop three media stories on species at risk work conducted in KNP per year; 15 to 20 Facebook posts on species at risk per year.	Increase awareness, reach, visibility and initial connections by increasing number of media and social media posts specifically on species at risk.	From 2016 to October 2021, 15 stories were covered in traditional media targeting species at risk, for an average of 2.5 per year. From 2016 to 2021, 44 publications about species at risk were made on social media, for an average of 7.3 per year. Additionally (slight change to the original goal), the park developed conservation messaging for species such as bats (pamphlet and web content), Piping Plover (web content), Salmon (web content, regulations pamphlet), Gulf of St. Lawrence Aster (web content) and Beach Pinweed (web content). Educational pieces on SAR species were also published yearly in the park's visitor guide.	100%

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
20) Offer education kits (Piping Plovers, American Eel, Atlantic Salmon): Eel and Plover education kits available on a loan system for schools, First Nations and non-governmental organisations; develop Atlantic Salmon education kit; initiate translation of education kits into Mi'kmaq.	Increase awareness, connections, and interactions with younger Canadians; grow and diversify base of support.	Educational kits were developed and produced in 2015-16 on American Eel and Piping Plover to be used with the public. They are also shared with our indigenous partners. The park also developed stencils for air-brushing tattoos of the three focal species, which come with species-specific educational capsules also developed by the park (this is a slight change to the original goal).	100%
21) Undertake stewardship for protection of Barn Swallow: Collaborate with wharf authorities to implement Best Management Practices.	Increase awareness; engage stakeholders in protection.	The park worked with port/harbour authorities to apply best management practices. The park helped the wharf of Loggiecroft to select new street lights that minimally affect wildlife, and also outlined compliance criteria in a repaving project at the wharf to protect nesting barn swallows nesting under the wharf.	100%*
22) Deliver public presentations on Wood Turtle: Presentation with Forestry Board and ATV club; inform and engage local residents (through partners); identify opportunities to raise	Increase awareness; engage stakeholders in protection.	The original measure based on public presentations to target groups was replaced by the alternative measures that follow. The park developed and published an educational pamphlet on wood turtle in 2016-17 and revamped its design with another round of production in 2019. Other outreach efforts for this species includes the	100%

Species and measure	Desired outcome	Progress towards outcome	Progress (% complete)
awareness of road mortality and other threats.		development of educational postcards, macaron-pins and pop-up stations. In 2020, the park redesigned and updated its web content on wood turtle.	
24) Develop visitor experience program that profiles SAR: Visitors will participate in citizen science activities as a "biologist for a day".	High quality visitor experience to increase awareness.	The "biologist for a day" program was developed in 2016 and implementation started in the same year. The program was offered yearly, except in 2020 and 2021 due to the COVID-19 pandemic. Participants worked alongside resource management officers on SAR species such as the Piping Plover and the Little Brown Myotis.	100%*

3. Action Plan Highlight: Atlantic Salmon Recovery – Return of the King

In 2018, we developed a 5-year Atlantic Salmon population restoration project for Kouchibouguac National Park and secured funding through the Parks Canada Agency's Conservation and Restoration (CoRe) program. The park's project was part of wider effort involving other national parks in the Atlantic provinces (Fundy, Cape Breton Highlands, Gros Morne and Terra Nova).

The project's implementation period is from 2019 to 2024 and includes habitat surveys, trapping and tagging of adult salmon, electrofishing of juvenile salmon, genetic sampling of the population, and deployment of fertilized eggs in protective trays in the park's riverbeds.

The project also created the Agency's first Parks Canada Research Chair (in Aquatic Restoration) and includes public engagement goals to educate the public on Atlantic Salmon conservation work in national parks.

4. ECOLOGICAL IMPACTS

Ecological impacts of the action plan are assessed by measuring progress towards meeting the site-based population and distribution objectives described in the action plan (Table 3). See the original action plan for national Population and Distribution Objectives (where available) and General Information and Broad Park Approach for each species. A more detailed description of progress made towards the site-based population and distribution objectives for some of these species is outlined in Appendix B.

Table 3. Progress towards achieving site-based population and distribution objectives for species at risk in Kouchibouguac National Park of Canada and associated National Historic Sites

Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
1) Piping Plover (melodus)	Maintain average productivity of 1.65 chicks per year per nesting pair, calculated as a 5-year running average.	Annual monitoring of the nesting population. Identify and monitor every Piping Plover nest in the Park to determine productivity. Participate in the International Piping Plover Census every 5 years.	Every year, all nesting pairs and their nests were monitored weekly until nesting failure or the number of fledglings could be determined. Mean fledgling productivity was above target from 2016 to 2019 but fell below target in 2020	80%

Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
			(1.64) and 2021 (1.32) due to non-compliance by park visitors and an increased presence of predators. Recovery efforts will be outlined in the next multi-species action plan.	
2) Gulf of St. Lawrence Aster	Species potentially extirpated from the Park. Possibility of reintroduction to re-establish/maintain occupancy in park.	Annual survey of suitable habitat at historical population sites and reintroduction sites (slight change from outcome initially described in the action plan).	Species was reintroduced to the park in a project funded by Parks Canada's Conservation and Restoration fund in 2016-2017. Efforts resulted in the establishment of a few small populations in the vicinity of historical population sites. Two of these populations were still extant in the fall of 2021.	100%
3) Beach Pinweed	Maintain and protect the distribution of suitable habitat occupied by the species (slight change from objective initially	Conduct survey every 5 years to monitor abundance and habitat, including the extent of area occupied.	Suitable habitat and distribution of the species is protected in the park with additional measure such as prohibited access to vegetated portions of the	95%

Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
	described in the action plan).		dunes. The park conducted an extensive habitat and distribution survey in 2019. An estimated %5 of habitat was lost due to storm surges, which cannot be mitigated. See appendix B for more information.	
4) Wood Turtle	Support species recovery through the protection of critical habitat, including nesting and hibernation sites if found in the park (slight change from objective initially described in the action plan).	Discovered nest sites and individuals will be monitored.	The species' presence was assessed as a protection measure at all sites affected by the rehabilitation of route 117. The species was not detected. Trials using eDNA techniques were done in 2017-2018 and did not lead to the species' detection. Critical habitat for wood turtle identified through past research in the park (2005-2007), representing areas likely to contain nesting or hibernation sites, is currently undergoing the legal protection process.	100%

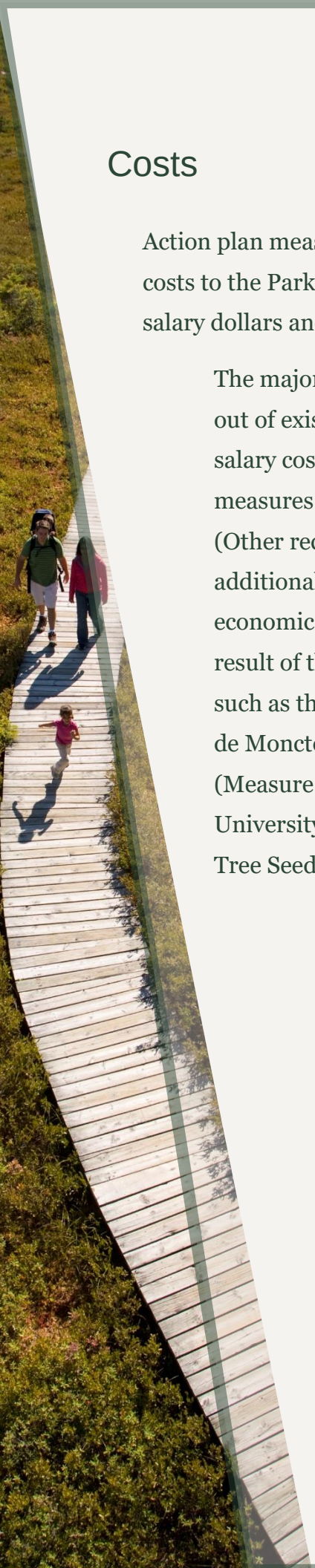
Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
5) Atlantic Salmon – Gaspé-Gulf of St. Lawrence population	Improve productivity above current level.	Assess adult migration, health and growth rates in estuaries of KNP, Richibucto River, Kouchibouguac River, Kouchibouguacis River. Assess productivity of juveniles per 100m^2 of habitat.	Productivity of the species in the park and its greater ecosystem was greatly improved by the release of almost 20,000 fertilized eggs since 2019, with yearly efforts to continue in the fall of 2021, 2022 and 2023 as part of the 5-year conservation and restoration-funded Atlantic Salmon conservation project.	100%
6) Bobolink, Eastern **7)** Meadowlark, **8)** Short-eared Owl	Maintain adequate habitat in the National Historic Sites.	Recording incidental observations.	Suitable habitat present in the field unit's national historic sites was maintained by applying best management practices for vegetation management in basic impact assessments produced for Beaubassin, Fort Beauséjour and Grand Pré.	100%

Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
9) Barn Swallow	Maintain occupancy in the Park.	Barn Swallow presence at both wharves (and other infrastructure) will be monitored, where possible.	Occupancy was maintained at the two wharves where the species occurs (Loggiecroft, and Cap Saint-Louis). Additional avoidance and mitigation measures were required for all renovation projects which could have jeopardized the status of colonies at those sites.	100%
Red Knot (rufa subspecies), Little Brown Myotis, Northern Myotis, Olive-sided Flycatcher, Chimney Swift, Canada Warbler, Eastern Whip-poor-will, Bank Swallow, Snapping Turtle, Common	None	Record incidental observations and share with partners. For forest birds, integrate the information into monitoring programs that will be developed.	While there were no objectives identified for these species (see original plan), incidental observations were recorded and integrated to our species occurrence database. Forest birds are now formally monitored through the Park's Ecological Integrity (EI) monitoring program on a 5-year cycle, with the most recent survey done in 2021.	N/A

Species	Site-based population & distribution objectives	Population monitoring	Progress towards site-based population and distribution objectives	Progress (% achieved)
Nighthawk, Rusty Blackbird, Striped Bass - Southern Gulf of St. Lawrence pop., Monarch, American Eel, Wood Thrush, Southern Twayblade, Eastern Wood-pewee, Bald Eagle, Canada Lynx				

5. SOCIO-ECONOMIC IMPACTS

The Species at Risk Act requires the responsible federal minister to report on the socio-economic costs of the multi-species action plan and the benefits derived from its implementation. The Multi-Species Action Plan only applies to protected lands and waters under the authority of the Parks Canada Agency, which are often subject to fewer threats (e.g., industrial activities) compared to other areas as the lands are managed to preserve ecological and commemorative integrity. This section does not include socio-economic impacts of existing permitted activities that may be occurring in Parks Canada places as those have been addressed through other processes (e.g.: impact assessments). This socio-economic assessment is narrow in scope, as it is focused on the measures implemented within the action plan, and primarily focuses on Indigenous partners, leaseholders, licensees, residents and visitors. The overall socio-economic impacts of the multi-species action plan for Kouchibouguac National Park and associated National Historic Sites, described as costs and benefits, are outlined below.



Costs

Action plan measures were integrated into the park's operational management. These costs to the Parks Canada Agency were covered by prioritization of existing funds and salary dollars and did not result in additional costs to society.

The majority of costs to implement this action plan was borne by Parks Canada out of existing salaries and goods and services dollars. This includes incremental salary costs, materials, equipment and contracting of professional services for measures outlined in Tables 1 (Recovery measures that will be conducted) and 2 (Other recovery measures that will be encouraged through partnerships or when additional resources become available) of the action plan. No major socio-economic costs to partners, stakeholders or Indigenous groups were incurred as a result of this action plan. Additional in-kind support was provided by partners such as the Canada Research Chair in Polar and Boreal Ecology at the Université de Moncton (Measure 6 in Table 1), the Mersey Tobeatic Research Institute (Measure 6 in Table 1), Saint Mary's University (Measure 6 in Table 1), the University of Prince Edward Island (Measure 13 in Table 2) and the National Tree Seed Centre (Measure 14 in Table 2).

The action plan applies only to lands and waters in Kouchibouguac National Park and National Historic Sites managed by the Northern New Brunswick Field Unit, and did not bring any restrictions to land use outside of these sites. This action plan placed no extraneous socio-economic costs on the public. However, some restrictions were placed on visitors to the Park. Visitors were prohibited from accessing part of the park's coastal dune ecosystem annually during the Piping Plover breeding season in order to protect nests. To protect Beach Pinweed from being trampled, Park visitors were prohibited from walking on vegetated portions of dune ecosystems. While no endangered bat species were found to occupy park structures, such discoveries would have limited visitor access to these assets as a result of conservation measures listed in the plan.

Benefits

Measures presented in this action plan for Kouchibouguac National Park contributed to meeting recovery as well as population and distribution objectives for Threatened and Endangered species, and also contributed to meeting management objectives for species of Special Concern. The measures sought a balanced approach to reducing or eliminating threats to species of conservation concern, and included protection of individuals and their habitat (e.g., access restrictions imposed on visitors and ongoing research and monitoring), species reintroduction (i.e., Gulf of St. Lawrence Aster) and increasing public awareness and stewardship (e.g., signage, visitor programs and publications in traditional and social media). These measures had an overall positive impact on ecological integrity and enhanced opportunities for appreciation of the sites and the species by visitors and the general public. Working with regional partners, staff deployed large quantities of fertilized Atlantic Salmon eggs in river systems that span beyond the park's borders, hence bolstering the population of this culturally important species on a regional scale. With the technical expertise of academic partners, staff restored the presence of Gulf of St. Lawrence Aster in the park and improved the natural legacy protected by Kouchibouguac National park for the benefit of Canadians.

Partnering with the National Tree Seed Centre, the park was able to preserve seeds of Gulf of St. Lawrence Beach Pinweed for use in future conservation efforts. Measures taken as part of the action plan also provided benefits to other species of conservation concern that depend on habitats protected by the Northern New Brunswick Field Unit, including Piping Plover, Beach Pinweed, Wood Turtle, Little Brown Myotis, Northern Myotis, Barn Swallow, Bank Swallow, Bobolink, Eastern Meadowlark and Shot-eared Owl. This action plan included measures that likely resulted in benefits to Canadians, such as positive impacts on biodiversity and the value that Canadians place on preserving biodiversity.

Potential economic benefits of the recovery of the species at risk found in Kouchibouguac National Park cannot be easily quantified, as many of the values derived from wildlife are non-market commodities that are difficult to appraise in financial terms. Wildlife, in all its forms, has value in and of itself, and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons. The conservation of wildlife at risk is an important component of the Government of Canada's commitment to conserving biological diversity, and is important to Canada's current and future economic and natural wealth.

Implementing this action plan had positive benefits for park visitors, local residents, and Indigenous groups. During this implementation cycle, we applied best management practices and associated precautionary guidelines diligently in contexts involving locations and infrastructures used by park visitors for various species, such as Little Brown Myotis, Northern Myotis, Barn swallow, Bobolink, Eastern Meadowlark, Short-Eared Owl and Barn Swallow. Technical, material and logistical support offered by park staff bolstered Atlantic Salmon conservation efforts on a regional scale, by facilitating and supporting similar projects with Indigenous partner Kopit Lodge and local watershed group Les Amis de la Kouchibouguacis

We worked with local communities, namely with the harbour authority committee at the Loggiecroft commercial fishing wharf situated inside the national park to ensure the protection of nesting barn swallows amid renovation projects. Visitors to Kouchibouguac National Park now have the possibility to participate in the park's monitoring programs and gain insight on conservation work in a national park setting thanks to the Biologist for a Day program that was developed.

Summary

The measures proposed in the action plan had limited socio-economic impact and placed no restrictions on land outside the boundary of the national park and associated National Historic Sites. Direct costs of implementing this action plan were borne by Parks Canada. Indirect costs were minimal and were limited to restrictions to visitor access, while benefits included positive impacts on park ecological integrity, greater awareness of species and enhanced opportunities for engagement of visitors, local communities and Indigenous groups.

Appendix A: Technical Compendium – Recovery Measures

Gulf of St. Lawrence Aster

Habitat inventory and reintroduction

Gulf of St. Lawrence Aster (Symphyotrichum laurentianum) is a small annual pioneer species of brackish coastal sands that typically occurs along the shores of barachois ponds and in barrier dune salt marshes. A rare endemic to the southern Gulf of St. Lawrence, the species is only known from a small number of sites on the Magdalen Islands (QC), the northeastern coast of New Brunswick and the northern coast of Prince Edward Island. The species was extirpated from Kouchibouguac National Park in 2000 after storms, which have been increasing in frequency and intensity, wiped out the remaining populations in the park.

In 2016, Kouchibouguac National Park, in collaboration with the Atlantic Canada Conservation Data Centre and the University of Prince Edward Island, mounted a two-year (2016-2017) project focused on reintroducing the species to the park using greenhouse-produced seeds and transplants[9]. The project was funded through the Parks Canada Agency's Conservation and Restoration (CoRe) Program. Its goal was to determine if suitable habitat still existed in the park and to test the feasibility of reintroducing the species.

Suitable habitat microsites for seed and transplant plots were identified based on prior field observations, examination of aerial imagery and field surveys conducted in 2016 and 2107. Habitat suitability was evaluated based on biotic and abiotic characteristics of known Gulf of St. Lawrence Aster occurrence sites throughout the species' range. A series of 31 seeding plots and 19 transplant plots were then installed along the park's coastline. Each seeding plot received a single input of roughly 1,000 seeds and transplant plots were each populated with 30 to 50 plantlets[9, 10]. Over both years, approximately 31,000 seeds and 800 plantlets were used. The sites are monitored yearly since 2016 to determine plot productivity. Fifty-five percent of seeding plots were productive in the year of seeding and 16% of plots consistently produced substantial numbers of individuals over a three- or four-year period. From 2016 to 2021, seeding plots are confirmed to have produced a total of roughly 8,000 individuals which successfully reached reproductive maturity[9]. Survivorship of plantlets averaged 72% in transplant plots and overall, approximately 620 transplanted individuals successfully completed their life cycle, blooming and setting seed before senescing[9].

This project has been highly successful in providing evidence that the park still contains habitat suitable for the species and that reintroduction is feasible and cost-effective. Efforts resulted in the establishment of a small number of occurrences, two of which were still extant in 2021[10]. Summary site checks in coming years will confirm whether established occurrences are indeed self-sustaining or if further seeding is needed. Along with similar efforts carried out in Prince Edward Island National Park, this project represents one of the first attempts to establish viable occurrences of this endangered species from seed and transplants, and the first attempt in New Brunswick. Knowledge gained and results obtained from this project will inform future recovery efforts throughout the range of the species.

Figure 1. A Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) plant specimen.

Figure 2. Typical freshwater coastal habitat colonised by Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) at Le Barachois in Kouchibouguac National Park of Canada.

References

[9] Mazerolle, D.M. (2020). Reintroducing the Threatened Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum*) in Kouchibouguac National Park: Preliminary efforts and feasibility assessment. Final Report. Kouchibouguac National Park, Kouchibouguac, NB. 55 pp.

[10] Kouchibouguac National Park. (2021). Kouchibouguac National Park species occurrence database. Unpublished data.

Appendix B: Technical Compendium - Population and Distribution Objectives

Gulf of St. Lawrence Beach Pinweed

Population monitoring, protocol development and seed preservation

Beach Pinweed (*Lechea maritima*) is a mostly coastal perennial plant ranging from North Carolina to the Canadian Maritime provinces. Its Canadian distribution is entirely restricted to coastal dune systems along the eastern coast of New Brunswick and the northern coast of Prince Edward Island. Canadian occurrences are disjunct from the species' main range and are considered to be of a variety endemic to the southern Gulf of St. Lawrence, referred to as Gulf of St. Lawrence Beach Pinweed (*Lechea maritima* var. subcylindrica). The coastal barrier dune systems of Kouchibouguac National Park of Canada were estimated in 2016 to support approximately 60% of this endemic variety's global population. Resource conservation staff carried out a single-year project funded by Nature Legacy funding in 2019 to update the population status of the species in the park and its region, and ensure its long term protection[11].

Extensive population surveys were conducted over 19 days from late September to early November 2019. Systematic sweeps of all potential habitat on the South Kouchibouguac, the North Richibucto and the South Richibucto dunes resulted in the precise documentation of over 1,700 distinct occurrences of the species. Approximately 57,500 individual plants were documented, 44,000 of which were situated within the park[11]. Comparison of the 2019 survey outcome with the last detailed survey of 2012 suggests a decline of almost 60% in the park's population. Preliminary investigation suggests that the sharp decline is related to the loss of a few small patches of habitat which contained high densities of plants in 2012. Erosion, overwash and saltwater encroachment related to storm surges appear to be the causes of habitat loss. In a context where climate change is driving a regional increase in storm frequency and intensity, further declines in habitat are expected.

In late November 2019, seeds were collected from a total of 250 individual plants among six sites within the park[11]. Collected material was prepared and submitted to the National Tree Seed Centre in Fredericton, New Brunswick. This will provide material for use in future recovery efforts and for research focused on the species' biology, ecology and life history.

Using a variety of flight transect arrangements and altitudes, we conducted field trials with a drone along an 800-metre-long section of the North Richibucto Dune in October 2019, with the goal of developing a drone-based monitoring protocol for the species. Acquired geospatial data were processed to produce orthomosaic and digital elevation models, and resulting geo-referenced imagery was examined to determine the potential of this technology for surveying the species and its habitat. The drone-based survey proved insufficient for detecting individual Beach Pinweed plants, but highly effective at mapping suitable habitat for the species. This confirmed the technology's potential for producing reliable habitat models to assess the species'

vulnerability to sea-level rise. A drone-based monitoring protocol for acquiring and processing geospatial data was developed[11].

By collecting extensive occurrence data, securing the long-term preservation of seed and laying the groundwork for habitat monitoring, the various components of this project made significant contributions toward achieving priority objectives identified in the federal Beach Pinweed management plan. The information collected through this project, in conjunction with recent declines detected at other population sites, may provide sufficient justification for a reassessment of Beach Pinweed's status in Canada by the Committee on the Status of Endangered Wildlife in Canada.

Figure 3. A Gulf of St. Lawrence Beach Pinweed (*Lechea maritima* var. subcylindrica) plant specimen.

Figure 4. Stable dune habitat typically colonised by Gulf of St. Lawrence Aster (*Lechea maritima* var. subcylindrica) on the Richibucto Nord dune in Kouchibouguac National Park of Canada.

References

[11] Mazerolle, D.M. & Brigley, C. (2020). Gulf of St. Lawrence Beach Pinweed (*Lechea maritima* var. subcylindrica) survey and conservation efforts on the Kouchibouguac and Richibucto dune systems. Final report. Kouchibouguac National Park, Kouchibouguac, NB. 37 pp.