Species at Risk Act
Action Plan Series

Action Plan for the Roseate Tern (*Sterna dougallii*) in Canada

Roseate Tern

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[1] http://www.registrelep-sararegistry.gc.ca

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), the federal competent ministers are responsible for the preparation of action plans for species listed as Extirpated, Endangered, and Threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the SAR Public Registry.

Under SARA, one or more action plan(s) provides the detailed recovery planning that supports the strategic direction set out in the recovery strategy for the species. The plan outlines what needs to be done to achieve the population and distribution objectives (previously referred to as recovery goals and objectives) identified in the recovery strategy, including the measures to be taken to address the threats and monitor the recovery of the species, as well as the proposed measures to protect critical habitat that has been identified for the species. The action plan also includes an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation. The action plan is considered one in a series of documents that are linked and should be taken into consideration together. Those being the COSEWIC Status Report, the recovery strategy, and one or more action plans.

The Minister of the Environment and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Roseate Tern and has prepared this action plan to implement the amended recovery strategy, as per section 47 of SARA. To the extent possible, it has been prepared in cooperation with the Provinces of Nova Scotia, Quebec, and New Brunswick, the Department of Fisheries and Oceans, the Roseate Tern Recovery Team, non-government organizations, aboriginal groups, industry stakeholders, and private landowners as per section 48 (1) of SARA.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions and actions set out in this action plan and will not be achieved by Environment Canada and/or the Parks Canada Agency, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this action plan for the benefit of the Roseate Tern and Canadian society as a whole.

The recovery strategy sets the strategic direction to arrest or reverse the decline of the species, including identification of critical habitat to the extent possible. It provides all Canadians with information to help take action on species conservation. When the recovery strategy identifies critical habitat, there may be future regulatory implications, depending on where the critical habitat is identified. SARA requires that critical habitat identified within a national park named and described in Schedule 1 of the *Canada*

[2] http://registrelep-sararegistry.gc.ca/default.asp?lang=En&n=6B319869-1%20

National Parks Act, a marine protected area under the *Oceans Act*, a migratory bird sanctuary under the *Migratory Birds Convention Act, 1994* or a national wildlife are under the *Canada Wildlife Act* be described in the *Canada Gazette*, after which prohibitions against its destruction will apply. For critical habitat located on other federal lands, the Minister of the Environment must either make a statement on existing legal protection or make an order so that the prohibition against destruction of critical habitat applies. For any part of critical habitat located on non-federal lands, if the Minister of the Environment forms the opinion that any portion of critical habitat is not protected by provisions in or measures under SARA or other Acts of Parliament, or the laws of the province or territory, SARA requires that the Minister recommend that the Governor in Council make an order to prohibit destruction of critical habitat. The discretion to protect critical habitat on non-federal lands that is not otherwise protected rests with the Governor in Council.

Implementation of this action plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

Acknowledgments

This plan was written by Julie McKnight and Andrew W. Boyne, Atlantic Species at Risk Recovery Unit of the Canadian Wildlife Service, Environment Canada with significant input from the following members of the Canadian Roseate Tern Recovery Team:

- J. Sherman Boates, Nova Scotia Department of Natural Resources
- Ted C. D'Eon, Local steward, Pubnico, Nova Scotia
- Marty L. Leonard, Dalhousie University
- François Shaffer, Canadian Wildlife Service, Environment Canada, Quebec
- Rebecca M. Whittam, Canadian Wildlife Service, Environment Canada, Atlantic

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Executive Summary

This action plan compliments the *Amended Recovery Strategy for the Roseate Tern (*Sterna dougallii*) in Canada* (Environment Canada, 2010). The proposed recovery measures seek to implement the full complement of broad recovery strategies and approaches set out in the amended recovery strategy for the entire population and distribution of the Roseate Tern in Canada. However, addressing the recent population declines at managed colonies (currently Country Island and The Brothers) has become the primary focus of recovery efforts for the species making the identification of potential nesting sites to restore a broader distribution a lower priority.

Critical habitat for the Roseate Tern was identified in the amended recovery strategy but may not be sufficient to meet the population and distribution objectives. Additional critical habitat may be identified at a later date, but no further critical habitat is identified in this action plan.

The critical habitat is located on both federal and non-federal land. Proposed measures to protect critical habitat are presented in section 1.4.

The recovery measures proposed in this action plan are related to eight broad strategies: 1) Reduce predation; 2) Ensure enough suitable predator-free nesting habitat; 3) Reduce human disturbance; 4) Identify (additional) critical habitat; 5) Vigilance for singular threat events; 6) Identify limiting factors at colonies; 7) Address key knowledge gaps to recovery outside the breeding period; and 8) Monitor population size, distribution, survival, movement, and productivity. A schedule outlining the priorities for the implementation of these measures has been developed and a socio-economic evaluation has been conducted. The implementation of the recovery measures outlined in this action plan will have moderate positive socio-economic impacts. The direct costs of implementing the action plan are estimated at $882,000 over the five years of the document.

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1. Recovery Actions

1.1 Context and Scope of the Action Plan

The Roseate Tern is a medium-sized pale seabird that is related to gulls and named for the rosy pink cast that appears on its underparts in summer. Their distribution is variable, but the Canadian occurrence of the Roseate Tern is in Nova Scotia and Quebec, and irregularly in New Brunswick. It was listed under the *Species at Risk Act* as Endangered in 2003. The recovery goal outlined in the amended recovery strategy for the Roseate Tern in Canada (Environment Canada, 2010) is to have no fewer than 150 pairs of Roseate Terns nesting in at least three colonies in Canada.

The Roseate Tern population in Canada was thought to be roughly stable ten years ago at about 100 pairs but after a number of years with high predation on adults, the number of pairs thought to be breeding fell to 72 in 2009. This decline has continued despite recovery efforts and the absence of adult predation since 2009. In fact, the number of pairs breeding at the two managed colonies (Country Island and The Brothers), fell over 22% between 2009 and 2012 (update from the amended recovery strategy: Environment Canada, unpublished data). These population declines are consistent with the wider Roseate Tern population trends in the US along the northeast Atlantic coast (Spendelow et al., 2008, US Recovery Team, unpublished data). Adult survival rates calculated from five US colonies (1998-2006) suggest that some vital rate other than adult survival is driving the recent population decline (Spendelow et al. 2008). Spendelow et al (2008) hypothesized that a reduction in postfledging survival and recruitment of young may be the cause but this still needs investigation.

This action plan addresses the recovery goal established in the amended recovery strategy for the Roseate Tern in Canada (Environment Canada, 2010) for all provinces where Roseate Terns occur in Canada. All short-term recovery objectives and recovery approaches detailed in the amended recovery strategy are addressed in this document. However, addressing the recent population declines at managed colonies (currently Country Island and The Brothers) has become the primary focus of recovery efforts for the species making the identification of potential nesting sites to restore a broader distribution a lower priority.

This action plan should be considered along with the amended recovery strategy for the Roseate Tern in Canada (Environment Canada, 2010). The amended recovery strategy provides more details on the strategic direction and approaches for recovery of the species, critical habitat information, and background information on the species and its threats.

1.2 Measures to be Taken and Implementation Schedule

The actions outlined in the following table are required to implement the approaches to meet recovery objectives set in section 1.3 of the amended recovery strategy for the Roseate Tern (Environment Canada, 2010).

Table 1. Implementation Schedule

	Recovery Measure	Threats or objectives addressed	Priority	Timeline
Broad Strategy: Reduce predation (Recovery Approaches in the amended recovery strategy: Enhance nesting habitat & Monitor threats)				
Approach: Manage predators				
1	Discourage avian predators through nest content destruction and with noise makers, where necessary	Predation	High	Ongoing - annually
2	Remove predators at colonies with Roseate Terns (e.g., American Mink, Great Horned Owls, and individual gulls and crows that persist in depredating terns despite non-lethal efforts)			Ongoing - as needed
3	Encourage long-term actions that may decrease gull populations near tern colonies e.g., closure of landfills, control of refuse at fish plants and on fishing boats, and discouraging people from feeding gulls			Ongoing - annually
4	Where present, keep larger mammalian predators (e.g., feral pets, foxes) out of colonies by electric fencing, when feasible (i.e., at small colonies)			Ongoing - annually
Approach: Monitor gull populations				
5	Continue gull surveys in Nova Scotia and the Magdalen Islands and initiate gull surveys at specific tern colonies where gull discouragement programs are planned or underway	Predation	Medium	Ongoing - at least every five years
6	Monitor the expansion and associated predation on terns by Ring-billed Gulls (*Larus delawarensis*) and Laughing Gulls (*Larus atricilla*)			Ongoing - at least every five years
7	Collect more data on resource use, home range size, and determinants of reproductive success of gulls at selected field sites, especially those near key colonies. Identify places where changes in land use practices would reduce the number of gulls at tern colonies			New - within five years
8	If actions are implemented that affect a local gull population, determine the pathway through which the gulls are impacted, and whether they become a problem elsewhere			New - if warranted

Recovery Measure		Threats or objectives addressed	Priority	Timeline
Broad Strategy: Monitor population size, distribution, survival, movement, and productivity				
Approach: Count adults				
9	Continue to survey for adult Roseate Terns annually at Country, The Brothers, and Magdalen Islands and survey Sable Island National Park Reserve at least every five years. If adults leave these islands after breeding failure, attempt to relocate adult birds at nearby colonies	Measuring progress	High	Ongoing - annually
10	Annually, encourage researchers at all tern colonies in Nova Scotia, Quebec, and New Brunswick to check carefully for the presence of Roseate Terns			Ongoing - annually
11	At least once every five years, continue aerial surveys of terns in Atlantic Canada (including Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland), or a complete ground survey where appropriate (Quebec). Follow aerial surveys with ground searches for Roseate Terns at colonies with historical nesting records and at large Common and/or Arctic Tern colonies within the range of Roseate Terns			Ongoing - at least every five years
12	Determine the suitability of methods used for detecting population change regularly, and revise methods accordingly			Ongoing
Approach: Measure productivity				
13	At managed colonies (currently Country Island and The Brothers), measure the number of breeding pairs and their productivity (ideally, the number of fledglings produced). Include, where possible, all species of tern as a surrogate of Roseate Tern productivity to increase sample size and sensitivity; potential species differences are to be considered in analysis and interpretation	Measuring progress	High	Ongoing - annually
14	Measure growth rates of chicks to assess productivity at managed colonies (currently Country Island and whenever possible, The Brothers)			Ongoing - annually
15	Confirm breeding and endeavor to ascertain reproductive success every five years at Sable Island National Park Reserve, yearly at the Magdalen Islands, and opportunistically at other sites			Ongoing - annually
16	In years when adults from Country Island appear to have relocated to nearby islands, ascertain their whereabouts and measure their reproductive success, whenever possible			Ongoing - as needed
Approach: Understand survival and movement of young and adults				
17	Continue to band terns with field-readable bands at Country Island and The Brothers. Focus on re-sighting banded birds	Measuring progress	High	Ongoing - annually

	Recovery Measure	Threats or objectives addressed	Priority	Timeline
Broad Strategy: Ensure enough suitable predator-free nesting habitat (Recovery Approaches in the amended recovery strategy: Enhance nesting habitat, Manage additional colonies, Protect habitat, Address sociopolitical issues, and Improve decision-making and planning)				
Approach: Enhance nesting habitat				
18	Prevent gulls from taking up residence on colonies through nest destruction and with noise makers	Habitat loss and degradation	High	Ongoing - annually
19	Where habitat is limiting, enhance areas preferred by Roseate Terns while maintaining habitat for Common and/or Arctic terns			
20	Provide nest shelters and assess their use			
Approach: Establish additional predator-free colonies				
21	Identify possible sites for restoration based on suitability for terns and on practicality as possible sites for restoration. Rank these based on draft habitat criteria from the US Recovery Team	Habitat loss and degradation	High	Completed
22	If a suitable site is selected, implement techniques for restoration. Maintain restoration efforts, including financial and logistic support, for several years and sustain active on-site protection of the colony thereafter			new - if warranted
Approach: Protect habitat				
23	Wherever possible, secure and designate unprotected colonies with Roseate Terns or a history of Roseate Terns appropriately as Migratory Bird Sanctuaries, National Wildlife Areas, Wildlife Management Areas (Nova Scotia) or Wildlife Habitat (Quebec)	Habitat loss and degradation	Medium	New – if feasible
24	Inform appropriate enforcement agencies so that specific site plans for protection are supported and enforcement agencies are prepared to act quickly in case of infractions			Ongoing
Approach: Outreach and Stewardship				
25	Investigate development pressure at suitable potential colony sites and work with stakeholders to mitigate threats	Habitat loss and degradation	Low	Ongoing
Approach: Ensure Roseate Terns are considered in environmental assessment and coastal planning				
26	Ensure the application of the precautionary principle to proposed projects that could interact with Roseate Terns and their habitat.	Habitat Loss and degradation and Human disturbance	Low	Ongoing – as needed
27	Engage in existing coastal planning initiatives			Ongoing

	Recovery Measure	Threats or objectives addressed	Priority	Timeline
Broad Strategy: Address key knowledge gaps to recovery outside the breeding period (Recovery Approach in the amended recovery strategy: Develop and maintain linkages)				
Approach: Form and maintain partnerships				
28	Explore possibilities for international collaborations that will identify and eliminate threats to migrating and wintering terns	Knowledge gaps	High	Ongoing
29	Support efforts to identify and protect important Roseate Tern staging areas			Ongoing
30	Encourage annual meeting of the Atlantic Canada Seabird Working Group (ACSWoG), attendance to the annual Gulf of Maine Seabird Working Group (GOMSWG) meeting, and facilitate yearly meetings of the Canadian Roseate Tern Recovery Team and regular meetings with the US Roseate Tern Recovery Team		Medium	Ongoing - annually; US - regularly
Broad Strategy: Identify limiting factors at colonies				
Approach: Research				
31	Partner with researchers to understand the factors limiting recovery at colonies	Knowledge gaps	Medium	New -within five years
32	Wherever possible, monitor the foraging ecology of Roseate Terns at managed colonies and understand distribution of the prey most likely taken by terns			Ongoing - annually
Broad Strategy: Identify (additional) critical habitat				
Approach: Implement Schedule of Studies				
33	Identify key characteristics that make potential nesting sites attractive to Roseate Terns	Knowledge gaps	Medium	Ongoing - partially completed; further analysis on hold
34	Identify foraging habitat at secure colonies			Completed
35	Identify transit and resting habitat beyond colonies			Not feasible
Broad Strategy: Reduce human disturbance (Recovery Approaches in the amended recovery strategy: Protect habitat, Monitor threats, Address sociopolitical issues)				
Approach: Stewardship				
36	Advertise and explain opportunities, encourage active community participation, and offer financial and logistic support for local management	Human disturbance	Medium	Ongoing
Approach: Outreach and Education				

Recovery Measure		Threats or objectives addressed	Priority	Timeline
37	At sites with human disturbance, develop site-specific plans for colonies with Roseate Terns. A site-specific plan will focus on discouraging disturbance and should be developed in consultation with landowners and local residents	Human disturbance	Low	New - as needed
38	Enhance public support for tern conservation through public talks, web postings, pamphlets, and feature articles			Ongoing
Approach: Monitor human disturbance				
39	Where human disturbance is an issue, assemble available data on recreational use of islands (e.g. from recreational groups, tourism bureaus, tour companies) and analyze such data in respect to the distribution and tenure of tern colonies	Human disturbance	Low	Ongoing – as needed
40	Where human disturbance is an issue, assess attitudes towards control of recreational use near colonies and incorporate analysis in local management plans			Ongoing – as needed
Broad Strategy: Vigilance for singular threat events (Recovery Approach in the amended recovery strategy: Monitor threats)				
Approach: Document singular events and mitigate where possible				
41	Document occurrence of sudden unexpected threats to terns including: severe storms, disease, spills of petroleum or other toxins, unanticipated declines in prey species, or range expansions of new predators. Use these data to select sites for colony restoration	Natural processes or activities, pollution	Low	Ongoing – as needed

"Priority" reflects the degree to which the measure contributes directly to the recovery of the species or is an essential precursor to a measure that contributes to the recovery of the species. High priority measures are considered those most likely to have an immediate and/or direct influence on attaining the recovery objective for species. Medium priority measures may have a less immediate or less direct influence on reaching the recovery population and distribution objectives, but are still important for recovery of the population. Low priority recovery measures will likely have an indirect or gradual influence on reaching the recovery objectives, but are considered important contributions to the knowledge base and/or public involvement and acceptance of species.

1.3 Critical Habitat

1.3.1 Identification of the species' critical habitat

Critical habitat was identified to the extent possible in section 1.3.4 of the amended recovery strategy (Environment Canada, 2010). It is recognized that that the critical habitat is insufficient to achieve the population and distribution objectives for the Roseate Tern. The schedule of studies (section 1.3.6 in the amended recovery strategy) outlines the activities required to identify additional critical habitat necessary to meet the population and distribution objectives. Progress on these activities is reported below. The amended recovery strategy also contains details about the identified critical habitat including its geospatial extent and biophysical attributes (1.3.4), and the activities likely to destroy critical habitat (1.3.5). Please refer to that document for details. This action plan does not identify any additional critical habitat. More critical habitat may be identified when the schedule of studies outlined in the amended recovery strategy is complete.

Progress to date for each activity in the Schedule of Studies (section 1.3.6 in the amended recovery strategy):

Identify key characteristics that make potential nesting sites attractive to Roseate Terns
The relationship between Roseate Tern nesting and the size and distribution of colonies of other species of terns was investigated. Preliminary results suggest that Roseate Terns in Nova Scotia only nest at colonies with at least 100 pairs of co-nesting Common (*S. hirundo*) and/ or Arctic Terns (*S. paradisaea)*. Further analysis on island characteristics (e.g., vegetation, size) and distribution (e.g., distance from mainland, distance to gull colonies, distance to foraging sites) is on hold. Addressing the recent declines at managed colonies (currently Country Island and The Brothers) has become the primary focus of recovery efforts for the species making the identification of potential nesting sites to restore a broader distribution a lower priority.

Identify foraging habitat at secure colonies
Thirty-two foraging locations were recorded for nine radio-marked individuals breeding on Country Island in 2003 and 2004 (Rock et al., 2007). Ninety percent (n=29) of the foraging observations occurred in water less than five meters deep and this habitat type represented 12% of the 330 km^2 survey area. This research did not identify specific areas where Roseate Terns repeatedly foraged in consistent numbers. Thus, specific foraging habitat cannot be identified as being necessary for the recovery or survival of the species. However, foraging ecology of the species is poorly understood at The Brothers and though this work would not be expected to lead to the identification of additional critical habitat, this information would be useful for the recovery of the species.

Identify transit and resting habitat beyond colonies
Due to the small Canadian population, it is not currently feasible to implement directed studies on transit or resting habitats for Roseate Terns (Environment Canada, 2010).

1.4 Proposed Measures to Protect Critical Habitat

The final amended recovery strategy for Roseate Tern, which included an identification of critical habitat, was posted on the SAR Public Registry in 2010.

1.4.1. Proposed protection measures on federal lands

Critical habitat for Roseate Tern was identified in Sable Island Bird Sanctuary, a migratory bird sanctuary under the *Migratory Birds Convention Act, 1994*. As required under SARA, a description of the portions of critical habitat for Roseate Tern found in this area was published in the Canada Gazette Part 1. This critical habitat is now protected under s. 58(1) of SARA. The gazette statement is available on the Species at Risk Public Registry.

Critical habitat for Roseate Tern also occurs in Sable Island National Park Reserve of Canada, a federal protected area. Sable Island National Park Reserve was listed on Schedule 2 to the *Canada National Parks Act* on December 1, 2013. As required under SARA, a description of the portions of critical habitat for Roseate Tern found in this area as well as a description of how critical habitat is legally protected on federal land and water was published on the SAR Public Registry by Parks Canada on October 1, 2014. This critical habitat is now protected under s.58b of SARA. The protection statement is available on the Species at Risk Public Registry.

It has been concluded that portions of Roseate Tern critical habitat on Country Island and its surrounding waters; as well as the surrounding waters of North Brother Island, South Brother Island, and Sable Island beyond its foreshore are not legally protected. Prior to making an order to protect critical habitat on federal lands, SARA requires the Minister to consult with every other competent minister.[3] The Minister of the Environment is also the Minister responsible for the Parks Canada Agency. The Minister of Fisheries and Oceans is not a competent minister for the Roseate Tern. Notwithstanding, consultation with the Department of Fisheries and Oceans and the Parks Canada Agency has further supported the finding that these portions of critical habitat identified on federal land in the final recovery strategy for Roseate Tern are not legally protected. As a result, subsections 58(4) and 58(5)(a) of SARA require that a ministerial order be made to protect Roseate Tern critical habitat in these areas.

1.4.2. Proposed protection measures on non-federal lands

With respect to those portions of critical habitat found on non-federal lands, Environment Canada intends to work with the provinces of Nova Scotia and Quebec to

[3] As per definition in SARA, competent minister means (a) the Minister responsible for the Parks Canada Agency with respect to individuals in or on federal lands administered by that Agency; (b) the Minister of Fisheries and Oceans with respect to aquatic species, other than individuals mentioned in (a); and (c) the Minister of the Environment with respect to all other individuals.

determine whether provincial acts and regulations constitute protection of critical habitat for this species under SARA.

In keeping with jurisdictional considerations, Environment Canada's approach is to begin by looking at the provincial legislation, and if necessary, move to an assessment of the provisions or measures under SARA or any other federal act to determine whether they can protect these portions of the critical habitat.

If it is determined that the critical habitat is not protected in whole or in part, progress towards achieving its protection will be included in the Species at Risk Public Registry via the reports provided for in section 63 of SARA.

The implementation of conservation measures is an important complementary strategy for preserving this species' critical habitat. Environment Canada will work with the applicable provinces, non-governmental organizations and individuals to facilitate the implementation of conservation measures.

2. Evaluation of Socio-Economic Costs and of Benefits

The *Species at Risk Act* requires that an action plan include an evaluation of the socio-economic costs of the action plan and the benefits to be derived from its implementation (SARA 49(1)(e), 2003). This evaluation addresses only the incremental socio-economic costs of implementing this action plan from a national perspective as well as the social and environmental benefits that would occur if the action plan were implemented in its entirety, recognizing that not all aspects of its implementation are under the jurisdiction of the federal government. It does not address cumulative costs of species recovery in general nor does it attempt a cost-benefit analysis. Its intent is to inform the public and to guide decision making on implementation of the action plan by partners.

The protection and recovery of species at risk can result in both benefits and costs. The Act recognizes that "*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*" (SARA 2003). Self-sustaining and healthy ecosystems with their various elements in place, including species at risk, contribute positively to the livelihoods and the quality of life of all Canadians. A review of the literature confirms that Canadians value the preservation and conservation of species in and of themselves. Actions taken to preserve a species, such as habitat protection and restoration, are also valued. In addition, the more an action contributes to the recovery of a species, the higher the value the public places on such actions (Loomis and White, 1996; DFO., 2008). Furthermore, the conservation of species at risk is an important component of the Government of Canada's commitment to conserving biological diversity under the *International Convention on Biological Diversity*. The Government of Canada has also made a commitment to protect and recover species at risk through the Accord for the Protection of Species at Risk. The specific costs and benefits associated with this action plan are described below.

The direct costs of implementing this action plan are estimated to be $882,000 over the five years of the document. Indirect costs are expected to be minimal and the benefits relate to the value of biodiversity to Canadians, positive impacts on eco-tourism and cultural values, and protection of the Roseate Tern as well as other species.

Direct Costs

Recovery measures outlined in the implementation schedule (Table 1) involve a variety of public and private stakeholders in both Nova Scotia and Quebec. The costs of implementing these measures have been estimated (to the nearest thousand) over a five year period in 2007 Canadian dollars and were further discounted to represent future costs in today's dollars. As outlined in Table 2, the total cost to implement the five year action plan is estimated at $882,000 which includes salary dollars, volunteer time, travel, equipment as well as other costs.

Table 2. Direct costs associated with implementing the approaches in the Implementation Schedule

Approach	Priority	Government (Federal & Provincial)	Other Stakeholders
Reduce predation	High	$20,000	$21,000
Reduce human disturbance	Low - Medium	$19,000	$14,000
Identify (additional) critical habitat	Medium	$10,000	N/A
Identify limiting factors at colonies	Medium	$9,000	$19,000
Address key knowledge gaps to recovery outside the breeding period	Medium - High	$34,000	$9,000
Ensure enough suitable predator-free nesting habitat	High	$404,000	$323,000
Monitor population size, distribution, survival, movement, and productivity	High		
TOTAL		$496,000	$386,000

Note: Costs were estimated in 2007 CDN$ for all years and discounted at a rate of 4% to bring future values to present day values.

Indirect Costs

Indirect costs are the potential costs associated with implementing the action plan, which may have an impact on various stakeholders. Impacts on stakeholders may include indirect costs associated with foregoing or modifying current and future activities. This action plan outlines how activities that pose a threat to the Roseate Tern and its critical habitat can be managed; resulting in some indirect costs.

The Roseate Tern was listed under schedule 1 of SARA in 2003, thus automatic prohibitions protecting the species are already in place. Furthermore, the Roseate Tern is a migratory bird and has been protected by the *Migratory Birds Convention Act* since 1917. Critical habitat was partially identified in the amended recovery strategy.

Coastal development activities may be impacted as a result of the protection of critical habitat. However, there may be ways to mitigate activities to prevent the destruction of critical habitat. At this time, specific development activities and any modifications that may be required are unknown, and therefore it is difficult to estimate the impact.

Benefits

Value of Biodiversity to Canadians

Biodiversity is essential for healthy ecosystems, human health, prosperity, security and well-being.

Canadians derive many benefits from biodiversity including recreational, aesthetic, educational, cultural benefits as well as ecological goods and services essential to human survival. Care for the environment is consistently ranked as one of Canada's top priorities in public opinion polls[4]. A recent opinion poll found that three quarters of Canadian respondents feel that preserving natural areas and the variety of native plant and animal life in Canada is important to them[5].

The total value of endangered species consists of non-consumptive use values (such as recreation, spiritual/cultural, research and education), indirect use values (value of the ecological role of a species in an ecosystem) and non-use values (i.e. preserving the benefits of nature for future generations)[6]. Achieving the goal of this action plan (i.e. the recovery of the Roseate Tern population) will have a positive impact on society. The direct value of recovering the Roseate Tern, for the preservation or the enhancement of biodiversity, is not easily estimated.

Eco-tourism and Cultural Values

Eco-tourism is the fastest-growing area of the tourism industry (Mastny, 2001). In 2004, this market grew three times faster than the industry as a whole and the World Tourism Organization estimates that global spending on eco-tourism is increasing by 20% a year, about six times the industry-wide rate of growth. (TEEB, 2008)

The communities near critical habitat have been attempting to utilize the uniqueness of the local habitat as a way to generate economic growth. In Nova Scotia, there is a Tern Festival each summer in Pubinco that features the Roseate Tern, while in Quebec there is a boat tour that stops near one tern colony to discuss the Roseate Tern.

As a result of achieving the recovery goals of this action plan, there will likely be an increase in eco-tourism activity, and the associated economic spin offs to local businesses and enhanced cultural value of local communities.

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[4] Canada's Fourth National Report to the United Nations Convention on Biological Diversity, 2010. Available online http://www.cbd.int/doc/world/ca/ca-nr-04-en.pdf Accessed December 3, 2010.

[5] Ipsos Reid Opinion Poll "Nine in Ten (87%) Canadians Say That When Connected to Nature They Feel Happier." Released January 7, 2011, www.ispsos.ca

[6] Non-use values include bequest value (satisfaction of knowing that future generations will have access to nature's benefits), altruist value (satisfaction of knowing that other people have access to nature's benefits) and existence value (satisfaction of knowing that a species or ecosystem exists).

Protection of Other Species
Conservation actions for Roseate Terns will have positive impacts on other species of island breeding birds with which it shares breeding sites including Common and Arctic Terns, Leach's Storm-petrels (*Oceanodroma leucorhoa*), Least Sandpipers (*Calidris minutilla*), Common Eiders (*Somateria mollissima*), "Ipswich" Savannah Sparrow (*Passerculus sandwichensis, princeps* subspecies), and Black Guillemots (*Cepphus grylle)*.

3. Measuring Progress

The performance indicators presented in the associated amended recovery strategy provide a way to define and measure progress toward achieving the population and distribution objectives.

Reporting on *implementation* of the action plan (under s. 55 of SARA) will be done by assessing progress towards implementing the broad strategies.

Reporting on the ecological and socio-economic impacts of the action plan (under s. 55 of SARA) will be done by assessing the results of monitoring the recovery of the species and its long term viability, and by assessing the implementation of the action plan.

4. References

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Appendix A: Effects on the Environment and Other Species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*[7]. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the Federal Sustainable Development Strategy's[8] (FSDS) goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of action plans may inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the action plan itself, but are also summarized below in this statement.

This action plan will clearly benefit the environment by promoting the recovery of the Roseate Tern. The potential for the plan to inadvertently lead to adverse effects on other species was considered. The SEA concluded that this plan will clearly benefit the environment and will not entail any significant adverse effects. The reader should refer to relevant sections in this document (Actions and Performance Measures, and, particularly, the Socio-economic Evaluation) and in the recovery strategy (Ecological Role; Limiting Factors; Threats; Critical Habitat; Approaches Recommended to Meet Recovery Objectives; and Effects on Other Species).

The effects on other species have been described in section 1.5 of the amended recovery strategy for the Roseate Tern (*Sterna dougallii*) in Canada (Environment Canada, 2010). Overall, it is anticipated that the recovery actions for the Roseate Tern will benefit non-target species, ecological processes, and the environment in general. Some threat mitigation actions may impact species, for example, the displacement or removal of predators, however, it will not be harmful to predator populations overall.

[7] http://www.ceaa.gc.ca/default.asp?lang=En&n=B3186435-1
[8] http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1