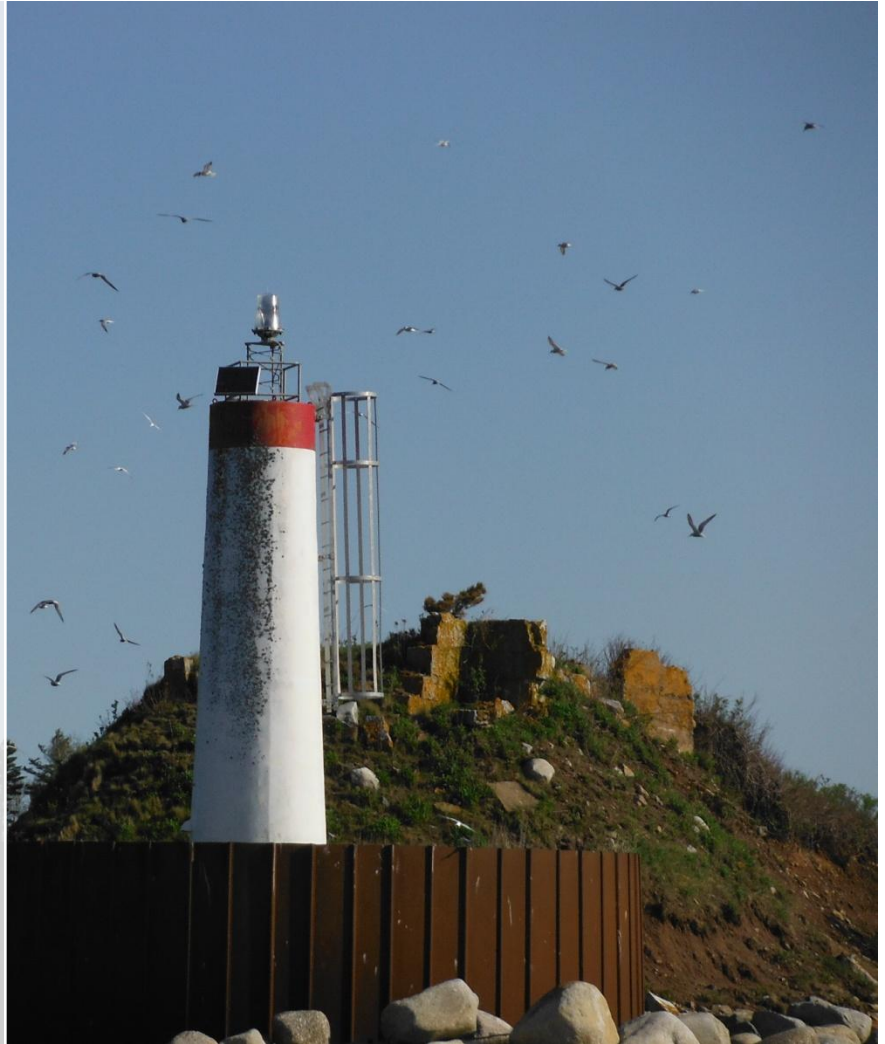


Roseate Tern Recovery Project

Danielle Pernette

2013



2013 Mahone Bay Roseate Tern Recovery Project Summary Field Report

MAHONE BAY ROSEATE TERN RECOVERY PROJECT

FIELD REPORT

2013-2014

Danielle Pernette



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ABSTRACT

Bluenose Coastal Action Foundation initiated the Roseate Tern Recovery Project (RTRP) in 2003 after Roseate terns had disappeared from the Mahone Bay area. Efforts to re-establish a secure nesting site for Roseate terns began on Quaker Island in 2004; however, efforts were abandoned on this island in 2007 after experiencing little success. The project was then scaled back and bay-wide surveys were conducted to determine tern and predator activity within Mahone Bay. As a result of these surveys, it was determined that efforts would be refocused on Grassy Island, a historical Roseate tern nesting island, and a stewardship program was initiated in 2010. During the summers of 2010-12, nesting boxes, tern decoys, and a mixed tern colony sound system were placed on Grassy Island for the purposes of attracting terns. As gulls are a common predator to terns, a permit was issued to deter gulls from nesting on Grassy Island. The island was monitored regularly, and although some terns colonized the island, it was always abandoned shortly thereafter and was unsuccessful in producing fledglings during all years of stewardship efforts. Therefore, the project was once again scaled back to just general monitoring in 2013 where bay-wide surveys were conducted within Mahone Bay to observe tern and gull activity.

Along with monitoring the seabirds, community education and outreach activities occurred throughout the duration of the project in the form of presentations and displays at local festivals and events.



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INTRODUCTION

BLUENOSE COASTAL ACTION FOUNDATION

Established in 1993, the Bluenose Coastal Action Foundation is a charitable community-based organization that addresses the environmental concerns within Lunenburg County, NS. The organization's goal is to promote the restoration, enhancement, and conservation of our ecosystem through research, education, and action. As once part of the Atlantic Coastal Action Program (ACAP), Bluenose Coastal Action Foundation was originally conceived to respond to the urgent need to restore human-impacted coastal environments so that they could continue to sustain coastal communities. The watershed boundaries in which Bluenose Coastal Action conducts its work include the coastline from Sandy Point to Cherry Hill and inland to include the following watersheds: Petite Riviere, LaHave, Mushamush, Gold, and East Rivers. The towns or communities of Lunenburg, Mahone Bay, Chester, Bridgewater, and New Germany fall within Coastal Action's watershed boundaries.

Over the past 20 years, Bluenose Coastal Action Foundation has successfully completed a number of projects within Lunenburg County. Currently the organization is involved in several projects which include, but are not limited to, the Atlantic Whitefish Recovery Project (AWRP), American Eel Habitat Assessment & Elver Abundance Study, Bridgewater Active Transportation, Environmental Home Assessment Program, Gold River Restoration and Salmon Research Project, LaHave River Watershed Project, and Mahone Bay Roseate Tern Recovery Project (RTRP).

TERN HISTORY IN MAHONE BAY

The islands within Mahone Bay lay midway between Atlantic Canada's two "managed" tern colonies; Country Island (Guysborough County) and North Brother Island (Yarmouth County). These colonies are large breeding grounds for Common terns especially, but also host Arctic tern as well as the endangered Roseate tern. It was estimated in 2007 that there were around 100 breeding pairs of Roseate terns in Canada, almost all of which nest on the two above mentioned islands. Terns nest in large colonies, almost entirely on small islands that are sparsely vegetated with beach grass and other herbaceous plants. Roseate terns differ from Common and Arctic terns, as they typically nest under cover of dense vegetation, driftwood, or artificial structures like boxes and tires. By nesting in large colonies, terns have greater protection from predators, especially Roseate terns which are less aggressive.

Terns that breed in Mahone Bay, NS arrive in early May and depart in late July to mid-August, travelling to staging areas down the coast to their wintering grounds in South America. Grassy Island, located in Mahone Bay, historically supported one third of the breeding Roseate tern population in Canada. Beginning in the mid-1990's, the terns abandoned Grassy Island after being displaced by a colony of Herring Gulls and Great Black-backed Gulls, which establish their nests three to four weeks before terns.



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SITE DESCRIPTION

Mahone Bay (44°30'N, 64°15'W) is located in Lunenburg County, Nova Scotia, Canada. The islands in Mahone Bay are a popular destination for recreational and commercial (lobster fishery) boaters. The Mahone Bay islands, ranging in size from 200 m² to 2400 m², provide a variety of habitats including rocky shores, cobble and sand beaches, dune complexes, tidal flats, wetlands, and mature forests. These coastal habitats have supported a diverse population of wildlife, both marine and terrestrial. Seabird and shorebird populations such as osprey, eagles, puffins, leach's storm petrels, razorbills, shearwaters, northern gannets, black guillemots, cormorants, and terns occupy these islands (Mahone Islands Conservation Association, 2014).

THREATS

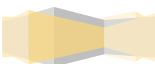
Threats to reproductive success of terns in Canada include predation at breeding colonies by Herring (*Larus argentatus*) and Great Black-backed (*Larus marinus*) Gulls, American Crows (*Corvus brachyrhynchos*), raptors, and American mink (*Neovison vison*). Gulls not only prey on terns and their eggs, but may also occupy valuable tern nesting habitat.

Predation, human disturbance, extreme weather events, habitat loss from development, rising sea levels, and pollution has threatened the recovery of the Roseate tern within Mahone Bay and other breeding sites in Atlantic Canada. In South America, a major threat to terns is trapping, as terns roost on beaches at night making them an easy target for trappers (Hinterland Who's Who 2013).

BACKGROUND

The Roseate Tern Recovery Project (RTRP) was initiated in April 2003 by the Bluenose Coastal Action Foundation. The primary goal of the project was to re-establish a secure nesting site for endangered Roseate terns on an island in Mahone Bay, Nova Scotia. This goal would fulfill the third objective of the "Recovery Strategy for the Roseate Tern in Canada", which hopes to restore a broader distribution of Roseate terns by establishing at least one more managed colony.

During the first year of the project, Bluenose Coastal Action determined that the most appropriate stewardship site for Roseate terns in Mahone Bay was Quaker Island. From 2004 to 2007, the organization facilitated research and recovery efforts on the island to establish a Roseate tern colony by using tern decoys, sound systems, nesting boxes, predator deterrence, and predator control measures. Unfortunately, successful stewardship on Quaker Island was not accomplished due to mink predation, severe storm events, and potentially anthropogenic disturbances. The lack of tern breeding success on



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Quaker Island led Bluenose Coastal Action to refocus their efforts in 2008 and 2009. During the next two field seasons, bay-wide surveys, at a maximum of three times per week, were conducted to document tern distribution, abundance, productivity, and reproductive success.

Beginning in April 2010, the RTRP initiated a tern stewardship program on Grassy Island due to its historical suitability as habitat for breeding terns, and also as it once held one third of the Roseate tern population in Canada. The island is located offshore, which limits anthropogenic disturbances, but is close enough to be regularly monitored. Grassy Island is a Wildlife Management Area owned by the Nova Scotia Department of Natural Resources (NS DNR). Therefore, gull deterrence and management efforts were first approved by NS DNR and the Canadian Wildlife Service (CWS). The stewardship on Grassy Island occurred from 2010 to 2012; however, efforts were unsuccessful and in 2013 efforts were scaled back and refocused on general monitoring of tern presence and distribution.

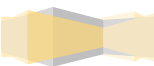
A Public Education and Outreach Program and a Tern Colony Signage Program are also implemented by the Bluenose Coastal Action Foundation. The outreach program aims to inform recreational users of Mahone Bay's islands as well as students and local community groups in Lunenburg County of the presence, conservation status, and recovery actions required for endangered Roseate terns, as well as provide information on tern colonies in general. The Tern Colony Signage Program was created to enhance public recognition of and respect for tern colonies. Ultimately, it is hoped that this will decrease or terminate any human disturbance to tern colonies, leading to healthier Common and Arctic tern colonies in Mahone Bay.

METHODOLOGY

To monitor seabird populations, a 20' Boston Whaler loaned to the project by Rick and Barb Welsford and was used to travel throughout the bay. The boat was equipped with safety gear including a radio, GPS, flares, first aid kit, etc. RTRP staff were required to obtain their Small Craft Operators License and participate in a boat safety course as well as be in receipt of current first aid training. While in the field a cellular telephone was carried at all times.

BAY-WIDE SURVEYS

Beginning in May, bay-wide surveys were to be conducted once a week until August. The Boston Whaler was used to travel to islands in Mahone Bay that could potentially host tern colonies. Information including the date, weather, temperature, time, researchers/observers, predators, as well as any bird species and their actions was recorded.



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TERN DISTRIBUTION AND ABUNDANCE

Once tern colonies were established at various islands in Mahone Bay, those islands were monitored once a week. Abundance was recorded during each visit by flushing the terns from the island and estimating the number of terns in flight. Through flushing the terns, a more accurate estimate was possible, as terns are not easily observed along the ground. Distribution and abundance was monitored regularly throughout the season, as terns tend to relocate often.

NEST, EGG, AND FLEDGLING COUNTS

Reproductive success was monitored June through August by conducting nest, egg, and fledgling counts. Nest and egg counts were conducted by having field staff walk in a straight line, one meter apart, while marking the line walked with flags. Nests and number of eggs were recorded on the inside of the flags, as flags were placed down and picked up in continuous lines across the nesting area. To eliminate recounting nests, popsicle stick pieces were laid in the nests as they were recorded. Counts were completed as quickly and efficiently as possible in order to minimize stress to adult terns and unprotected eggs. Predated eggs and chicks were also recorded.

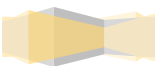
Due to inabilities to get out to the islands in August, fledgling counts were not conducted in 2013.

PERMITS

Grassy Island and Pearl Island are both Wildlife Management Areas owned by the Nova Scotia Department of Natural Resources (NS DNR) and permits were required to monitor seabird populations up to three times a week from the boat. Bluenose Coastal Action staff were permitted to land on Grassy Island as required throughout the field season. On Pearl Island, project staff were allowed to land on the island up to three visits during the breeding season to assess the productivity and reproductive success of the terns, with the accompaniment of Andrew Boyne with the Canadian Wildlife Service (CWS) or his nominee.

OUTREACH AND EDUCATION

The Education and Outreach Program was established by RTRP staff in April 2008. The program was continued in 2013, as many events, wharves and/or marinas, schools, and festivals were attended in order to reach a maximum number of individuals within various interests and age groups. The program was created to inform users of Mahone Bay's islands and local groups in Lunenburg County of the presence, conservation status, and recovery actions required for the endangered Roseate tern, as well provide general information on Common and Arctic terns. By educating the community, the RTRP team



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hopes to increase involvement in, and support of, recovery activities. To accomplish the objectives, various educational materials (i.e., newsletters, brochures, postcards, etc.) were developed and distributed along with presentations at local events and schools.

TERN COLONY SIGNAGE PROGRAM

Permanent interpretive signs were posted at wharves and yacht clubs (Figure 1a). Seabird Nesting signs were placed on islands with active tern colonies (Figure 1b). Two signs were placed on either side of the

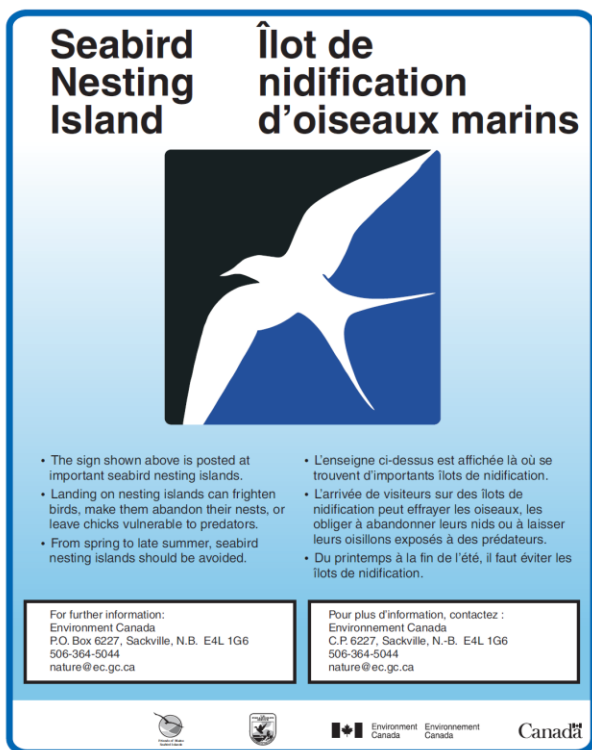
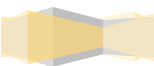


Figure 1a: Seabird nesting sign permanently posted at wharves.



Figure 1b: Seabird nesting sign posted annually on islands where terns are observed nesting.

islands with tern populations to make visible to boaters on either side. Signs were mounted on a post and placed in a holding box filled with large rocks (taken from the island on which the sign was posted) to provide greater stability. Signs were placed a safe distance above the high tide line to prevent them from being dislodged during storm events. In the case that a colony was abandoned, the signs were removed from that island so local residents and boaters would not question the credibility of the signs (and hence, reduce their effectiveness at active colonies). A sign was also posted for the breeding season on Westhaver Beach and removed in the fall to avoid damage or loss over the winter.



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RESULTS

DISTRIBUTION AND ABUNDANCE

Terns were widely observed throughout Mahone Bay; however, only nested on a select few islands. Tern distribution and abundance fluctuates often throughout the season as terns relocate. Terns were observed on several islands including Backman's, Grassy, Gully (in Bayport), Mash, Pearl, Saddle, and Westhaver Islands (Figure 2); however, nest counts were only conducted on Saddle and Westhaver Islands.

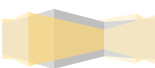
Gully Island is typically the first island where terns are observed each year. On May 26th, at least 25 terns were observed on Gully Island by a local resident; however, only three were observed the following day and none after that.

On a trip to Pearl Island on May 31st, about 12 terns were observed from the boat; however, the island was not revisited and it is unknown if terns nested.

Grassy Island had 14 terns observed on June 13th, but all abandoned soon after.

Mash Island had a reported 60 terns on July 9th, as observed by a local resident; however, Bluenose Coastal Action were unable to get out and observe nest or fledgling numbers.

Westhaver Island had the largest tern colony during 2013 with 87 nests; however, was abandoned by July. Backman's Island, which lies near Westhaver Island, had 20 terns observed by a resident on June 23rd; however, RTRP staff were unable to get out to make further observations. As the colony on Westhaver Island disappeared and more terns appeared on Mash and Backman's Islands, it is possible the terns relocated there from Westhaver Island.



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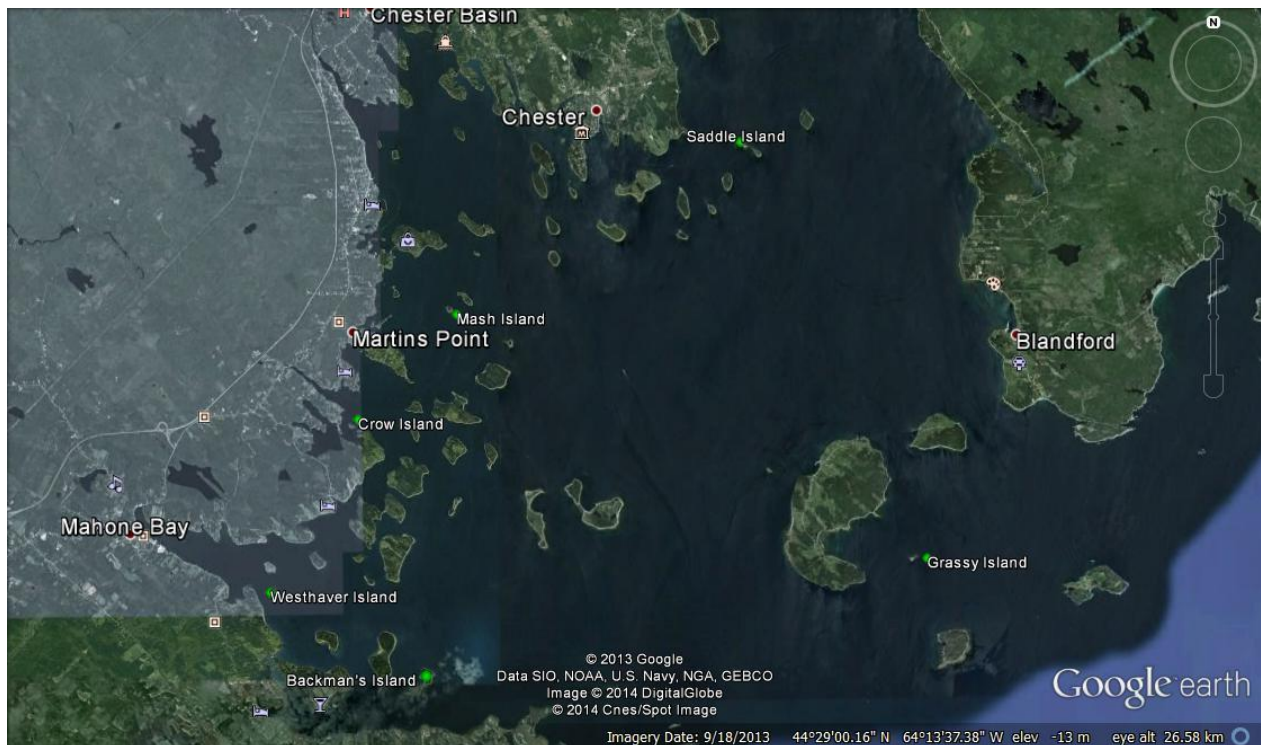


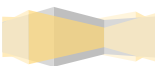
Figure 2: Mahone Bay tern presence and distribution 2013.

REPRODUCTIVE SUCCESS

Nest counts were conducted on islands where terns were thought to be nesting; i.e., where terns were observed regularly throughout the season. Counts were conducted once a fairly consistent number of terns had been on the island for a couple weeks. Numbers of terns on each island vary each year. Note that nest counts include all tern species observed in the area (Common, Arctic, and Roseate – although there have been no nesting Roseates in years). Nests were only observed on Westhaver Island (87 nests) and Saddle Island (three nests) in 2013; however, terns were also thought to be nesting on Mash Island but not confirmed.

No fledgling counts were conducted in 2013 due to scheduling conflicts, poor weather conditions, and boat troubles. However, several juvenile terns were spotted throughout the bay in late August.

The total number of nests decreased from 338 in 2011, to 237 nests in 2012, and 90 in 2013 (Figure 3).



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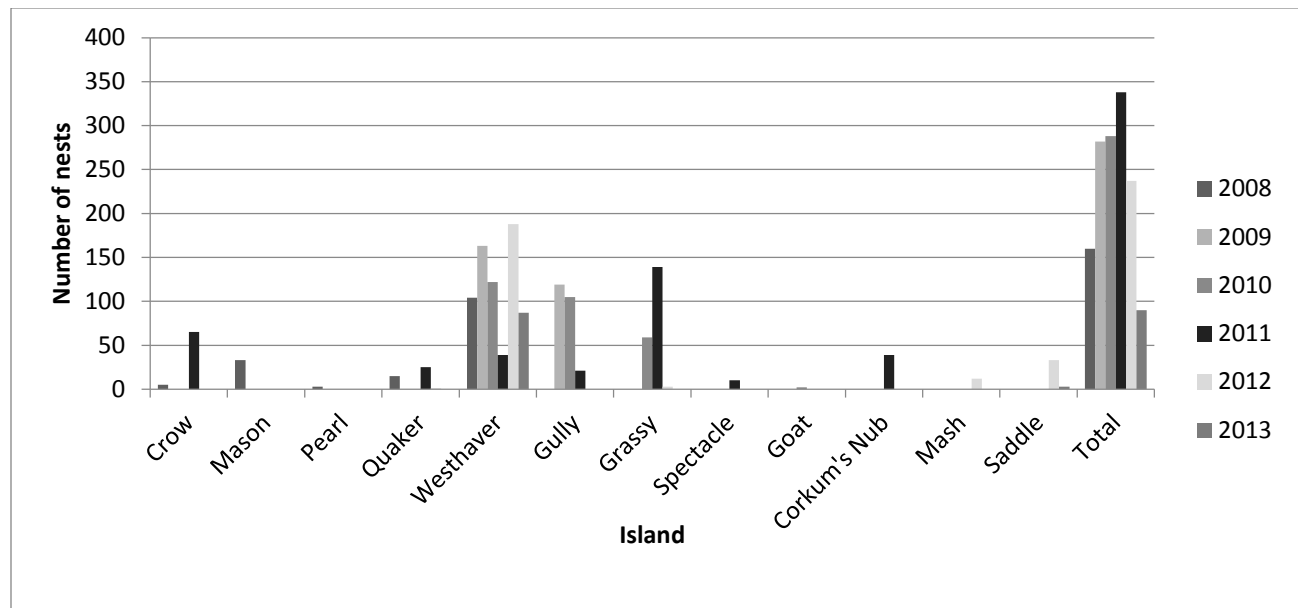


Figure 3: Total nests in Mahone Bay 2008-2013.

OUTREACH AND EDUCATION

A number of events were attended this year including the Halifax International Boat Show, Indian Point Young Naturalists Club (X3), Mahone Bay Pirate Festival and Regatta, Mushamush Camp, and Bridgewater Growing Green Festival. An estimated 500 people were reached through these activities and events. In addition, 100 handouts (each) of Mahone Bay maps, brochures, and boater cards were distributed to Paddle South Kayak Rentals for customers.



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DISCUSSION

DISTRIBUTION AND ABUNDANCE

Terns are colonial birds and the presence of other terns (in Nova Scotia, Common and Arctic species) is highly important to Roseate terns, as they preferentially nest in large colonies of other terns (>100 pairs) (Gochfeld et al. 1998, Environment Canada 2010). During the 2013 breeding season, Westhaver Island was the largest colony, hosting just under 100 pairs of breeding terns, and therefore inadequately able to attract Roseates.

The weather during the 2013 breeding season may have been a factor contributing to low nest numbers, as it was after inclement weather that terns disappeared from Crow and Westhaver Islands.

The number of nests (which indicate breeding pairs) in Mahone Bay has overall been trending downwards (Figure 4), even though efforts have increased and been refocused. Trends by Environment Canada's Canadian Wildlife Service, which look at the entire province(s) tern populations, show that larger colonies may be growing as smaller colonies disappear. Since there are several other larger colonies already established with fairly sustained populations in Nova Scotia (including North Brother, Country Island, and Sable Island), and Mahone Bay hosts several small colonies, terns from Mahone Bay could possibly be joining larger colonies as larger numbers offer more protection and increase breeding success.

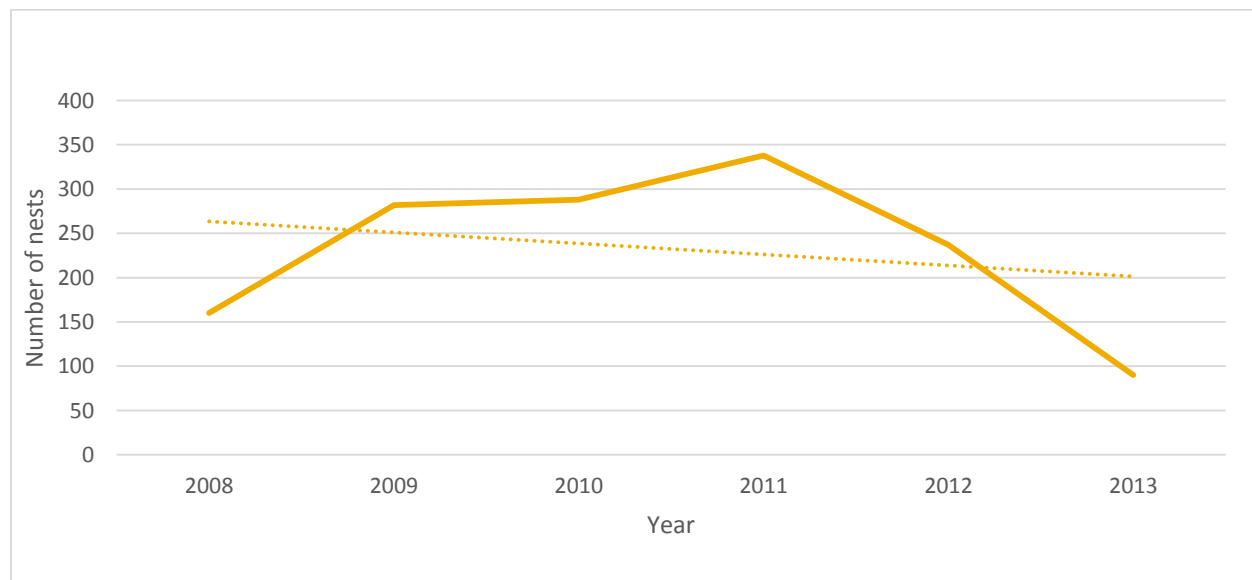


Figure 4: Mahone Bay tern nest trend 2008-2013.



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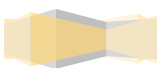
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Rather than put forth efforts to attract terns to Mahone Bay, which has proven to be difficult without much success over the last few years, future work should involve just general monitoring of tern presence and distribution, along with nest and fledgling counts, similar to the 2013 field season.

CONCLUSION

Recovery efforts are taking place throughout Nova Scotia in hopes of reversing the declining population of Roseate terns in Canada. Bluenose Coastal Action Foundation has been making an effort to establish another managed Roseate tern colony since 2003, refocusing efforts from Quaker Island (2004-2007) to Grassy Island (2010-2012). As inclement weather, anthropogenic disturbance, and other unknown disturbances may negatively impact breeding tern colonies, increased monitoring efforts may need to take place so as to determine what is going on with tern populations. As what happens during the non-breeding over wintering grounds is widely unknown, efforts are to be put forth to monitor tern populations over winter by Environment Canada. As for Mahone Bay tern populations, general monitoring will continue to be done throughout the breeding season to keep track of tern numbers, distribution, and reproductive success. Public outreach and education in the community will also continue into the future.



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