

2007-2008

Roseate Tern Recovery Project



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2007-2008

Summary

Roseate terns (*Sterna dougallii*) are listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and have experienced major declines in Canada over the past 20 years, with Mahone Bay being no exception. BCAF has been implementing a conservation management plan in Mahone Bay for the past five years, with a focus on Quaker Island, and has seen no success in the Roseate tern or general tern population on Quaker Island or any of the other islands in the bay. The tern population in the bay has suffered dramatically from the effects of human disturbance and development, which seem to constantly be on the rise in the area. Human presence is seen everywhere throughout the bay during the tern breeding season, as it is the most popular season for recreational boating and ocean activities, as well as it being considered one of the most attractive aspects to tourists visiting the area. In addition to human impacts, predation is of a large concern, with the most threatening culprits being gulls, mink, and owls. Mahone Bay's tern population has been unable to fledge a single tern chick in at least 3 years and needs enhanced support to ensure their survival.

Review

BCAF has been successfully delivering stewardship projects in Lunenburg County for the past 14 years. One of BCAF's major on-going projects deals with the conservation of coastal islands in Mahone Bay. The first 3 years of the project, which was initiated in 2000, involved collecting data necessary to develop a strategic conservation management plan for the islands. In 2003, the project focused specifically on the plight on the endangered Roseate tern. BCAF partnered with the Canadian Wildlife Service (CWS), as well as the Habitat Stewardship Program (HSP), to develop a project to provide a secure nesting site for Roseate terns in Mahone Bay. The first year of the project was a feasibility study to identify potential sites to implement stewardship efforts. In consultation with the Canadian Roseate Tern Recovery Team, it was determined that Quaker Island was the best island for tern stewardship efforts. The next four years of the project involved focused stewardship efforts on Quaker Island, with a combination of habitat enhancement, tern social attraction, gull deterrence, and public education.

The Roseate Tern

The Roseate tern is a relatively small seabird with a slender body, short legs, long and pointed wings, and a deeply forked tail. It has a black forehead and nape, pale grey upper wing, and white tail. Its underside is also white; however, during breeding season, it takes on a pale rosy tint. The Roseate tern is classified as an endangered species in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The Roseate tern, denoted as ROST, is a migratory seabird making a round-trip each year from its

wintering grounds in South America to breed on the islands off the east coast of the United States and Canada. Roseate terns only nest within colonies of Common terns (*S. hirundo*), denoted as COTE, and Arctic terns (*S. paradisaea*), denoted as ARTE. Large colonies of COTE and ARTE afford the Roseate terns the protection that they cannot derive from smaller colonies of their own species.

Quaker Island

Quaker Island is located 2 km south of Chester, Nova Scotia. This 20.3 ha island is cleared of trees and offers a large swath of excellent tern nesting habitat on the western tip. This habitat contains dry cobble substrate, raspberry bushes, rose bushes, as well as large, dry areas of short grass. Reports from locals suggest that Quaker was the site of very large tern colonies in the 1970s.

The island is listed as being owned by the South East Asia Plantation Co. LTD, of which Christopher Ondaatje owns the controlling interest. A lighthouse is located on the top of the island where NS Transportation and Public Works owns 1.6 acres.

Aerial Photo of Quaker Island



Permits

The following permits were required to conduct research on Quaker Island:

- Scientific Capture/ Take permit – CWS. This permit allows the disturbance, color marking, and shooting of Herring and Great Black-backed Gulls, as well as the destruction of gull nests and eggs.
- Animal Care Committee approval – CWS. This permit is required to obtain a CWS Scientific permit; it can be approved by ACC from another agency (i.e., Dalhousie).

The Royal Canadian Mounted Police in Chester, Coast Guard Search and Rescue in Halifax, the Inshore Search & Rescue station in Chester, and Chester Fire Department were contacted prior to the start of the field season and informed that project researchers would be living on Quaker Island and potentially firing pyrotechnics. A Quaker Island Protocol (available at the BCAF office) was developed prior to the field season and used as a manual by project staff to guide their actions on the island.

2007 Field Season (April 30-August 15)

The RTRP field crew established camp on Quaker Island on April 30th, in the same fashion as previous years. There was an immediate detection of mink living underneath the baby barn left from the last field camp. A nuisance wildlife trapper was brought to the island the following day to set traps and the female mink was live trapped that evening. The mink unfortunately died in the trap before it could be transferred off the island and its young died due to lack of warmth. Traps were left active for the remainder of the field season; however, no further mink presence was detected on the island. The crew set up tern attractant measures including nesting boxes, Roseate and Common tern decoys, and a tern caller sound system on the western tip of the island where terns had historically nested. Data collection began on May 1st, and involved recording the following:

1. General Island Surveys - General Island Surveys are point counts of all birds present and are conducted at 0600, 1300, and 2000.
2. Weather Datasheets - The following weather variables are to be recorded at 0600, 1300, and 2000: temperature, cloud cover, rainfall, wind speed, and sea state.
3. Noisemaker Observations - When pyrotechnics are fired to scare gulls, record the observer, time, number of predators, and reaction of predators.
4. Daily Journal - At the end of each day, enter all of the day's activities and significant occurrences (e.g., first egg found, any major predation event, etc.).
5. Gull Nest Datasheet - Record the date the nest was destroyed and the number of eggs composted.
6. Quaker Island Bird List - Record all bird species sighted on the island throughout the season. The purpose of collecting data on other species (See Exhibit D) is to monitor the effect of predator control methods on other species nesting on the island.
7. Predator Watches - Predator Watches document predator intrusions into the colony, the length of time of the intrusion, and whether or not the intrusions were successful. They begin when the terns begin laying (late May/early June). Watches

will be conducted during three time periods (0600-0800, 1200-1400, and 1800-2000) and should span the entire two-hour observation period.

8. Tern Monitoring Data - Extensive data to be collected on nesting terns, including general observations, nest and egg counts, productivity, diet, and chick growth data. See Quaker Island Protocol for full details (pp.12-15).

BCAF was notified of an initial tern presence in the bay by an Island Watcher. A single tern was observed May 8th, on Hobson's Nose, just off Second Peninsula. Tern abundance grew and they ultimately made their way to the inland islands where they were seen by field crew on May 15th. Previous to tern arrival on Quaker Island, the field crew were implementing gull deterrence measures to prevent gulls from nesting; however, pyrotechnics were only fired on one occasion and there was no attempt by gulls to nest on Quaker. Despite efforts by the project team, there was no nesting by terns on Quaker Island for the duration of the field season. Data collected on Quaker Island can be found in the Appendix.

Satellite colonies showing a tern presence in May were: Westhaver (50), Grassy (30), Saddle (6), Mash (70), Crow (40), Hell (20), and Hobson's (12) Islands. All of these colonies abandoned the first week of June due to what can only be identified as a storm event. Terns were only found around the inland islands in small numbers for the rest of the breeding season. The first trip out to Pearl Island on July 5th, showed a tern population of approximately 500 birds and appeared to be doing quite well. Contrary to popular belief, a trip on July 24th showed that the colony had abandoned and tern presence was down to 20. The last visit to Pearl was August 15th, in where tern presence was limited to 2 birds. The lack of success on Pearl Island was attributed to gull predation, as gull chicks were found in the site previously inhabited by terns and were quite healthy, suggesting they had found a good food source in the tern eggs, etc. It appears as though no tern chicks were fledged in Mahone Bay during the 2007 field season.

Education and Community Involvement

Public outreach followed suit from previous years of the RTRP. BCAF posted tern colony signs on Quaker Island, as well as popular boat launch sites around Mahone Bay. BCAF also gave presentations at schools, municipal and town councils, boat launches/wharfs, and yacht clubs regarding the project and information about terns. Roseate tern placemats were distributed to three participating restaurants surrounding Mahone Bay to be used by/given to guests; newsletters were distributed throughout the communities of Mahone Bay, Chester, and Lunenburg; and RTRP brochures were given out at local festivals and events. One-on-one consultations were conducted with boaters in the Mahone Bay area and a bird ID session, open to the public, was conducted at the Lunenburg Yacht Club in May. It is estimated that 350 people were informed and educated with regard to the RTRP and the plight of the Roseate tern.

The BCAF Island Watchers program also increased its numbers to 44 and methods on how to better engage Island Watchers in the project will be investigated in the upcoming 2008 field season.

Signs Posted In and Around Mahone Bay for 2007.



Discussion

The first year of the Roseate Tern Recovery Project (April 2003-March 2004) was a feasibility study. Data was collected regarding the distribution of Common and Arctic terns, with whom Roseate terns nest, as well as predators. BCAF prioritized potential islands for stewardship using criteria developed by the US Roseate Tern Recovery Team. This information was presented to the Canadian Roseate Tern Recovery Team and the decision was made to focus our stewardship efforts on Quaker Island. The owner of the island was receptive to the project and agreed to permit BCAF to initiate recovery efforts.

In Year 2 (April 2004- March 2005), an active stewardship program was initiated on Quaker Island, and 25 pairs of terns nested. A severe thunderstorm on July 19th, 2004, caused many nests to flood and the adults abandoned the colony the next day. Although no chicks fledged, the project was still considered a success. This was the first year of the project and similar restoration projects in the Gulf of Maine have never had as many nests in the first year.

In Year 3 (April 2005 – March 2006), project staff resumed field techniques as conducted in 2004. Nesting was again successful, with 23 active nests as of July 9th. The colony abandoned; however, on July 11th, after a mink predated the nests. BCAF again considered the project a success despite the fact that no chicks fledged, as nesting numbers were

encouraging prior to this unforeseeable event, terns continued to frequent the island following nest abandonment, and the mink was successfully trapped approximately three weeks after the predation incident. In addition, the island's owner is firmly committed to the continuance of the project.

In the fourth year of the project (April 2006 – March 2007), a field camp was established on Quaker Island on April 24th, 2006. As a result of gull management, no gulls nested on Quaker Island during the 2006 field season. Mink again made their presence known on Quaker, with a juvenile male making an appearance in early May. Thankfully, the mink was discovered before the first terns were sighted in the area a few days later. Following their arrival, terns regularly frequented Quaker Island, exhibiting mating and feeding behaviour, but no nesting occurred. Staff remained on the island until the end of July in hopes of a late nesting season, but unfortunately, no terns nested on Quaker Island in 2006. It was likely that predation events on the colony during the previous two field seasons made the terns leery of nesting on Quaker. While tern colonies were established elsewhere in the Bay in 2006, including Westhaver, Pearl, and Saddle Islands, these colonies were also abandoned before any eggs could hatch. This was likely largely the result of two major issues faced by the terns: frequent inclement weather and significant human disturbance (CWS, 2006).

A similar trend emerged during the 2007 field season; terns were spotted in the area of Quaker Island but no nesting occurred on the island (April 2007 – March 2008). A field camp was established on the island at the end of April. A mink was found on the island prior to the arrival of any terns and was successfully trapped. There was no other mink activity reported on the island for the remainder of the field season; therefore, making it possible to rule out mink as a factor in the non-establishment of the terns. However, unlike previous years, there were no other successful nesting tern colonies in the bay. The lack of nesting terns in the bay during the 2007 field season was the determining factor in the decision by the Canadian Roseate Tern Recovery Team and BCAF not to return to Quaker Island for a focused restoration project in 2008. It was decided to scale back the project to general bay wide surveys in order to observe all tern activity in the area, in the hopes of refocusing the project on a specific island for the 2009 field season.

Acknowledgements

The Roseate Tern Recovery Project is a joint initiative between the Bluenose Coastal Action Foundation and Canadian Wildlife Service. There is also an advisory committee that provides guidance and expertise for project decisions and aids in the overall delivery of the project. The Island Watchers program, implemented by BCAF to allow the community to provide additional information on tern activity in the bay, is also a big part of the project success.

BCAF would like to especially thank the following people who gave their time and effort in support of the Roseate Tern Recovery Project:

- Andrew Boyne, CWS
- Brad Toms, CWS

- John Mills, NS DNR
- Reg Newell, NS DNR
- Bob Weld, Local Resident
- Nancy Covington, Summer Resident
- Mike Ernst, Local Resident
- Paul MacDonald, Local Resident
- Joe Laird, Local Resident
- Garnet Heisler, Local Resident

Appendix

The pages attached to the document are copies of data collected by the RTRP team.

General Island Surveys

Date	Time	Location of observer	Species	Sex (M/F)	Age (AD/JU/DU/CH)	# birds	location of observed birds	Total number
01/05/07	1300	Camp	GBBG		AD	2	Flying near lighthouse	2
	1300	Hillside/camp	Sparrow		AD	1	Grasses behind barn	1
	1700	East Island	CORM		AD	4	On rock in water	4
02/05/07	700	Pond Area	SAVS		AD	6	Tall grasses	7
	1930	Beach by Camp	WILL		AD	3	Beach	3
03/05/07	1500	South End Island	SAVS		AD	3	SE of island	3
04/05/07	1000	Tern colony/pond	SAVS		AD	2	Tern colony/pond	2
	1000	Tern colony/pond	ABDU		AD	4	In pond/flying	4
	1000	Tern colony/pond	RWBL	M	AD	2	Tern colony/pond	2
	1800	Tern colony	Gull		AD	1	Flying over tern colony	1
	1800	Tern colony	Crow		AD	1	Flying over tern colony	1
	1800	Tern colony	Sparrow		AD	1	Flying just above grass	1
	1800	Tern colony	RWBL	M	AD	1	Flying just above grass	1
	1900	SE side of Quaker	Sparrow		AD	1	Flying just above grass	1
	1900	SE side of Quaker	Sparrow		AD	1	Flying just above grass	1
	620	Camp	Sparrow		AD	1	As shoreline meets camp	3
05/05/07	1148	Camp	CORM	M	AD	3	Flying over water	
06/05/07	1748	Camp	GBBG	M	AD	2	Flying over water	
07/05/07	730	Camp	AMCR	M	AD	2	Flying over tern point	
	730	Camp	GULL		AD	2	Flying over water	
	800	Camp	COLO		AD	1	Flying overhead	
	1230	Tern Colony	Pigeons		AD	3	On shore	
08/05/07	1140	Tern Colony	Crow		AD	4	On shore	
	1840	Camp	BAEA		AD	1	Hunting-pond/hill	
09/05/07	1000	Tern Colony	HERG		AD	3	Flying-tern colony	
	1130	Tern Colony	GULL		AD	~50	Around fishing boat	~50
11/05/07	1230	In Baby Barn	GBHE		AD	1	Flying west	1
	1300	Baby Barn	Black Guillemot		AD	2	Flying west	2
12/05/07	1500	W side of Quaker	BAEA		AD	1	Flying over Clay Island	1
20/05/07	1230	Baby Barn	BARS		AD	2	In front of baby barn	2

General Island Surveys

Date	Time	Location of observer	Species	Sex (M/F)	Age (AD/JU/DU/CH)	# birds	location of observed birds	Total number
20/05/07	1300	Front of Barn	Red wing black bird		AD	1	Back of barn	1
	1445		CORM			12	Tip of SW point	12
21/05/07	815	On beach, ½ camp>point	Common Loon		AD	1	Sitting in the water	
			COTE		AD	5	Flying above point	23
			CORM		AD	1	Flying from point to Meisner's	
			HERG		AD	16	On point- 12 flew away	
	1217	Camp	CORM		AD	14	Flying by in a flock	
			DUCKS		AD	2	Sitting in water close to shore by the point	22
			CROW		AD	2	5m above ducks on beach	
			COTE		AD	2	Circling around point	
22/05/07	818	Camp	HERG		AD	1	Soaring above camp	2
			GBBG		AD	1	Sitting on point	
	835	Camp	COTE		AD	2	Flying ~100m off shore	4
			HERG		AD	2	One on beach, other flying	
	1330	Camp	CORM		AD	1	Standing at the point	1
23/05/07	1247	Camp	OSPR		?	1	Flying E with prey	1
	1610	Camp	BRSW		AD	4	Flying around camp like crazy	4
12/06/07	1820	Camp	Eider	1M, 3F	AD	4	Water in front of camp	
15/06/07	1300	Camp	Humming bird		?	1	Flew by camp	1
	1330	Camp	YSFL		AD	1	Flew through camp	

WEATHER											
Date (dd/mm/yyy y)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,7 5,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
01/05/2007	0600										
	1200			7.1	100		8.5	N		2	
	1826	3.5	9.8	8.1	80	8	10	N		2	
02/05/2007	0650	2.3		3.2	50	8	0	N		1	
	1239			14.5	100	8	2	N		1	
	1814		17.1	14.1	25	8	0	N		1	
03/05/2007	0850	2.3		7.3	25	8	24	N		3	
	1206			9.8	50	8	27	N		3	
	1807		9.8	7.7	90	8	35	N		3	
04/05/2007	0800	2.0		6.0	25	8	27	N		2	
	1200			9.2	75	8	22.5	N		2	
	1803		9.2	8.4	100	8	9.3	N		2	
05/05/2007	0612	4.2		4.3	100	8	10.4	Y	11.5	1	Light rain, very grey outside and calm
	1149			7.9	100	8	11.1	Y	11.5	2	
	1800		12.5	7.8	100	8	20.5	Y	11.5	2	Raining off and on
06/05/2007	0556	2.0		2.1	100	8	5.4	N		1	
	1150			8.5	75	8	20.1	N		3	
	1800		9.5	8.2	100	8	10.8	N		2	

WEATHER											
Date (yyyy/mm/dd)	Time (24 hr)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
07/05/2007	0600	-0.3		0.9	50	8	7.5	N		2	
	1200			13.2	0	8	9.3	N		2	
	1800		21.6	16.5	100	8	22.6	N		4	
08/05/2007	0600	4.5		7.3	50	8	12.9	N		2	
	1200			22.1	50	8	4.3	N		1	
	1800		25.1	20.3	75	8	24.8	N		4	
09/05/2007	0600	4.5		7.6	25	8	1.8	N		0	
	1200			20.3	10	8	9.3	N		1	
	1800										Off Quaker at the Bird ID Session
10/05/2007	0600	5.3		10	25	8	5.6	N		1	
	1200			17.8	0	8	12.2	N		1	
	1800		23.4	13.2	10	8	5.0	N		1	
11/05/2007	0600	3.6		8.2	100	1.5	2.5	Y		1	Light rain, random showers
	1200			15.0	100	2	4.3	N		1	
	1800		21.0	19.0	50	8	8.2	N		1	
12/05/2007	0600	7.8		8.5	75	8	13.2	Y	3.5	1	
	1200			7.3	75	8	16.5	N		3	
	1800		19.1	12.6	0	8	7.5	N		2	

WEATHER

Date (yyyy/mm/dd)	Time (24 hr)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
13/05/2007	0600	1.8		6.2	100	8	3.2	N		1	
	1200			15.4	100	8	6.1	N		1	
	1800		16.8	9.4	100	8	8.6	N		1	
14/05/2007	0600	2.6		5.0	50	8	10.0	N		1	
	1200			11.8	75	8	10.4	N		1	
	1800		16.2	14.6	30	8	2.8	N		1	
15/05/2007	0600	0.2		4.9	100	8	4.7	N		1	
	1200			17.9	100	8	9.0	N		1	
	1800		20.3	11.6	100		10.8	N		1	
16/05/2007	0600	1.0		8.2	100	8	5.4	Y		1	
	1200			4.4	100	8	14.0	Y	5.0	1	
	1800		11.7	1.3	100	8	14.7	N	5.0	1	
17/05/2007	0600	-9.3		-1.6	100	5	15.8	Y	2.5	1	
	1200			5.0	100	5	10.0	N		1	
	1800		9.2	7.7	100	8	11.8	N		2	
18/05/2007	0600	3.1		4.6	100	8	11.5	Y	3.0	2	
	1200			5.9	100	5	8.6	Y	3.5	1	
	1800		7.9	5.4	100	1.5	12.9	Y	4.0	2	

WEATHER											
Date (yyyy/mm/dd)	Time (24hr)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
19/05/2007	0600	5.3		6.2	100	0.5	2.2	Y	25.0	1	
	1200			8.0	100	0.5	0.3	Y	40.0	0	It's ugly out
	1800		10.9	9.8	100	0.2	0.0	Y	46.5	0	Feet Wet, Toes falling off
20/05/2007	0600	6.9		8.9	100	8	2.5	N	39.0	0	
	1200			16.2	100	5	7.5	N	39.0	1	Wind from the south, quite calm, warm sun
	1800		17.2	9.5	90	5	12.9	N	39.0	2	Not a bad day
21/05/2007	0600	6.6		7.4	100	>5	0.0	N	40.0	0	Damp, rained overnight
	1200			10.6	90	>5	18.3	N	40.0	2	The wind is cold but it has brightened up some
	1800		12.3	11.1	80	>5	21.6	N	0	3	Cold but clouds have reduced
22/05/2007	0600	2.3		2.3	20	5	16.5WNW	N	0	3	A lot of dew this morning, cold but sun is out
	1200			9.4	50	>8	10.8N	N	0	2	Quite windy and cold but bright, no birds at all
	1800		12.3	9.3	25	8	17.2NE	N	0	2	Pretty nice
23/05/2007	0600	0.3		3.1	25	8	12.9NE	N	0	2	
	1200			12.9	0	8	4.3SW	N	0	1	Very nice
	1800		16.4	12.6	0	8	5.7SW	N	0	1	A1
24/05/2007	0600	0.9		2.9	25	8	0.0	N	0	1	
	1200			12.6	100	8	9.0SE	N	0	1	Right nice like
	1800		19.9	16.4	0	8	4.3SW	N	0	1	pretty

WEATHER

Date (yyyy/mm/dd)	Time (24hr)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
25/05/2007	0600	6.7		6.8	100	6	10.8SE	Y	2.5	1	
	1200			16.4	25	8	2.5SE	N		1	
	1800		19.5	14.6	100	5	8.6SE	N		1	
26/05/2007	0600	7.3		7.5	100	0	0.7SE	N	2.0 overnight	1	Foggy
	1200			19.4	25	8	0.7NE	N		1	
	1800		29.6	24.9	100	8	34.2NW	N		2	So nice
27/05/2007	0600	9.7		11.2	75	8	4.2NW	N		1	
	1200			20.9	25	8	5.4SE	N		1	
	1800		22.6	19.1	75	8	7.9SE	N		1	
28/05/2007	0600	8.4		8.5	100	8	10.0SE	N		1	
	1200			10.1	100	5	10.0SE	Y	1.0	1	
	1800		12.0	11.2	100	1.5	2.8SE	Y	3.0	1	Showers on and off
29/05/2007	0600	5-10		~10	50	8	>10NW	N		1	Weather station broken!!!
	1200			19.9	75	8	10-15NW	N		2	
	1800		26.2	18.7	100	8	~20NW	N		3	
30/05/2007	0600	8.8		11.2	100	8	<5SE	N		1	
	1200			17.1	35	8	<5NW	N		1	
	1800		21.5	19.8	100	8	5-10SW	N		1	

WEATHER

Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
31/05/2007	0600	8.5		11.0	80	8	5-10SE	N		1	
	1200			19.8	50	8	5-10SE	N		1	
	1800		20.6	19.8	75	8	5-10SE	Y		1	
01/06/2007	0600	8.8		10.0	100	8	0-5SE	N		1	
	1200			19.7	95	8	0-5SE	N		1	
	1800		22.0	18.5	100	8	0-5SE	N		1	
02/06/2007	0600	13.7		17.3	100	8	5-10NE	N		2	
	1200			23.7	75	8	0-5SW	N		1	
	1800		23.7	17.7	75	5	0-5SW	N		1	
03/06/2007	0600	10.0		11.5	100	8	5-10SE	Y	.01	1	
	1200			18.2	80	8	5-10SE	N		1	
	1800		20.2	16.2	50	8	10-15SE	N		2	
04/06/2007	0600	9.4		10.2	100	5	10-15SE	Y	.05	2	
	1200			11.0	100	8	15-20E	Y		2	
	1800		15.1	12.2	100	1.5	15-20SE	Y	.7	3	
05/06/2007	0600	11.8		12.3	100	0.5	0-5SE	N		1	
	1200			26.7	100	5	0-5SE	N		1	
	1800				100	2	0-5SE	Y	.07	1	

WEATHER											
Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
06/06/2007	0600	9.0		11.0	100	0.5	0-5SE	N		2	
	1200			14.0	100	2.0	5-10SE	N		2	
	1800		20.0	14.2	70	8.0	10-15SE	N		4	Clouds cleared during the day
07/06/2007	0600	10.0		11.0	100	8.0	5-10NW	N	0.5inch	2	
	1200			14.2	100	8.0	5-10W	N		1	
	1800		21.0	20.5	5	8.0	5-10NW	N		4	
08/06/2007	0600	12.0		14.1	0	8.0	0	N		0	
	1200			21.0	0	8.0	5-10SE	N		1	
	1800		27.0	26.9	0	8.0	5-10SE	N			
09/06/2007	0600	11.5		12.2	0	8.0	5-10SE	N		1	
	1200			18.8	25	8.0	5-10SE	N		1	
	1800		22.0	20.1	0	8.0	5-10SE	N		1	
10/06/2007	0600	9.0		11.0	100	8.0	5-10SE	N		1	
	1200			20.1	100	2.0	5-10SE	Y	Misting	1	Rained on and off
	1800		21.5	21.3	100	8.0	5-10SE	N		1	
11/06/2007	0600	8.0		9.0	100	2.0	0	Y	8.0	1	
	1200			18.5	100	8.0	0-5E	N		3	Rained on and off
	1800		19.3	14.2	100	2.0	0	N		2	

WEATHER

Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
12/06/2007	0600	7.5		8.0	100	5	5-10SE	Y	1.0	1	
	1200			16.2	100	5	5-10SE	N		1	
	1800		16.5	14.5	100	8	10-20SE	N		2	
13/06/2007	0600	6.0		8.0	100	8	10-20SE	N		2	
	1200			14.8	100	8	15-25SE	N		3	
	1800		15.0	14.7	100	5	5-10SE	Y		1	
14/06/2007	0600	7.0		8.5	100	5	5-10NW	Y		1	
	1200			12.9	100	8	10-20NW	N		2	
	1800		14.5	14.1	50	8	5-10NW	N		1	
15/06/2007	0600	8.0		10.2	100	5	5-10NE	N		1	
	1200			20.0	75	8	5-10NE	N		1	
	1800		22.0	15.0	100	8	5-10NE	N		1	
16/06/2007	0600	11.6		12.1	100	5	3.9NE	Y	2.0	0	
	1200			16.8	100	4	4.3SE	N	4.0	1	
	1800		17.9	14.8	100	>0.5	7.9SE	N		2	
17/06/2007	0600	10.6		11.7	100	5	0	N	0.5	1	
	1200			20.6	80	8	8.6SE	N		1	
	1800		23.1	20.5	0	8	7.5S	N		2	

WEATHER

Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
18/06/2007	0600	12.4		13.8	100	8	3.6NE	N	1	1	
	1200			18.3	100	8	20.5NW	N	0	4	
	1800		19.8	19.5	25	8	15.4NW	N	0	4	
19/06/2007	0600	11.4		11.7	100	8	15.8N	N	0	4	
	1200			15.8	50	8	19.8N	N	0	4	
	1800		20.8	19.8	50	8	14.7N	N	0	3	
20/06/2007	0600	8.8		10.6	50	8	7.5N	N	0	2	
	1200			21.6	25	8	11.5SE	N	0	1	
	1800		24.6	18.8	100	8	6.4S	N	0	1	
21/06/2007	0600	11.3		11.6	100	5	8.2NE	Y	10.0	2	
	1200			19.6	100	8	20.5NW	N	5.5	3	
	1800		23.0	19.9	100	8	5.7NW	N	0.5	1	
22/06/2007	0600	11.4		18.6	100	>0.5	2.1SE	N	0	1	Really Foggy
	1200			23.5	75	5	4.3SE	N	0	1	
	1800		23.9	16.3	50	8	6.1SE	N	2.0	1	
23/06/2007	0600	11.4		12.3	100	8	1.4NW	Y	1	1	
	1200			20.1	95	8	7.9NW	N	0	2	
	1800		23.9	18.8	40	8	25.9NW	N	0	3	

WEATHER

Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
24/06/2007	0600	12.3		11.2	100	8	8.2W	N	0	2	
	1200			21.2	50	8	16.2W	N	0	2	
	1800		25.3	21.8	90	8	11.5W	N	0	2	
25/06/2007	0600	10.2		13.3	25	8	0	N	0	1	
	1200			21.5	40	8	10.4SE	N	0	2	
	1800		28.1	22.6	25	8	11.5SE	N	0	1	
26/06/2007	0600	10.3		13.5	100	8	2.1SE	N	0	1	
	1200			25.8	5	8	10.0W	N	0	2	
	1800		31.8	27.8	75	8	15.4W	N	0	3	
27/06/2007	0600	15.3		15.4	25	5	3.6SE	N	0	1	
	1200			29.7	75	5	10.4SE	N	0	2	
	1800		31.7	28.3	5	5	16.2NW	N	0	3	
28/06/2007	0600	14.2		15.0	100	5	3.6SW	N	0	1	
	1200			25.9	95	2	9.0SE	N	0	2	
	1800		29.1	26.5	95	7	7.9SE	N	0	2	
29/06/2007	0600	15.8		16.4	95	8	6.1NE	N	0	1	
	1200			23.3	95	8	17.2NW	N	0	3	
	1800		26.0	22.2	25	8	12.9NW	N	0	3	

WEATHER

Date (yyyy/mm/dd)	Time (24 hour)	Nightly Min. T (°C)	Daily Max. T (°C)	Current T (°C)	Cloud cover % (0,25,50,75,100)	Visibility (km)	Wind Speed (Beaufort)	Rain (y/n)	Rainfall (mm)	Sea State (Beaufort)	Comments
30/06/2007	0600	10.6		12.6	25	8	8.2W	N	0	2	
	1200			23.9	25	8	8.6W	N	0	2	
	1800		25.6	24.6	75	8	24.4W	N	0	4	
01/07/2007	0600	9.8		12.2	75	8	8.2W	N	0	2	
	1200			23.7	75	8	3.9W	N	0	1	
	1800		26.1	21.6	50	8	9.7W	N	0	2	
02/07/2007	0600	8.5		16.0	25	8	1.8W	N	0	0	
	1200			24.9	75	8	7.9SW	N	0	2	
	1800		29.1	24.2	95	8	14.0N	Y	0.5	3	
03/07/2007	0600	8.5		12.3	50	8	9.7W	N	0	2	
	1200			21.8	50	8	7.9S	N	0	2	
	1800		25.3	19.9	75	8	7.2W	N	0	1	
04/07/2007	0600	8.2		11.9	0	8	0	N	4.5	0	
	1200			22.7	50	8	9.7SE	N	0	2	
	1800		24.9	21.7	75	8	6.1SW	N	0	1	
05/07/2007	0600	10.3		11.5	100	8	3.6SE	N	0	1	
	1200			13.9	100	8	6.4SE	Y	1.0	1	
	1800		15.6	14.2	100	5	6.1SW	Y	11.5	1	

NOISEMAKER OBSERVATIONS

Date dd/mm/yyyy	Location	Time (24hr)	Observer	SHOTS	Number of predators present		EFFECT
					HERG	GBBG	
23/05/07	SE part of Quaker	2015	BD/MR	2	~40	~10	They all flew away

Tern Observations						
					Observations/ Comments	
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Terns	Predators
15/05/07	1215	BD/JS	4	0	First terns of the season, flying around bay in front of camp, diving in water, etc	No other birds in close proximity
17/05/07	1400	JS/MD	4	0	Flying around over water in front of camp	
19/05/07	1530	JS	4	0	Foraging over water in front of camp, one had something in its mouth	
	1930	JS	4	Lots of gulls	Hanging out around point all day	Gulls just sitting there (raining)
	2000	JS	?	?	Too foggy, but really sounds like roseate	
20/05/07	1130	JS	~15	0	By the point, some doing zig zag flight pattern (mating)	
	1445	WR	6	0	They were in groups of 3 and one group landed on the beach toward the tip, the others were flying around	There were 12 CORM sitting on the tip of the point
21/05/07	800	WR	4	~20	2 pairs flying over tip, doing zig zag pattern	18 HERG, 2GBBG, 1CORM sitting on the point, but weren't bothering the terns at all
	800	WR	2	0	Hanging out over fishing boat just off Meisner's	
	1214	WR	2	0	2 terns flying around over the point	There were also 14CORM flying by in a flock, 2 ducks in water by point shoreline, 2 crows 5m up on the beach
	1315-1345	WR	1		Tern vs. duck for food, lasted 30min, duck won with diving advantage	
	1816	WR	1		COTE sitting on rock at the tip of the point Note: there seems to be 2 terns hanging around regularly	
22/05/07	835	WR	2	2	Most likely the same pair, flying ~100m offshore of Quaker looking for food	There are 2HERG in the area but not threatening
23/05/07	1235	BD	2	0	Sitting on yellow buoy/marker in the Bay, flying around in front of camp	Nothing in sight
	1239	BD	3	0	3 more flying around tern colony	Nothing in sight
	1500	BD	4	0	2 pairs took off from colony chasing each other around-then back to colony	nothing

Tern Observations						
					Observations/ Comments	
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Terns	Predators
23/05/07	1600	BD	4	0	Flying around colony/front bay	
	2000	BD	6	2	Flying over colony	2 gulls sitting on the point, no interacting with the terns
24/05/07	1530	BD	3	0	I went near colony, terns didn't like that, flew over my head squawking	
	1630	BD	3	0	Flying/diving for food near Meisner's Island	
	1645	BD	2	0	Went to get marine battery, 2COTE squawking at us but didn't dive bomb	
	1921	BD	3	0	Flying around the bay, diving and squawking	
25/05/07	1120	BD	1	0	Sitting on racing buoy	
	1145	BD	4	0	Flying above colony, diving in the water	
	1315	BD	3	0	Flying above colony, diving in water	
	1530	BD	1	0	Flew over camp and into the fog	
	1630	BD	1	0	COTE sitting on racing buoy for ~5min, then flew to Meisner's and out of sight	
	1725	BD	2	0	2 terns, flying E>W across the Bay to the tern colony. Flew around a bit and landed	
	1845	BD	2	0	Same as above	
	2010	BD	2	0	Circling the colony, saw them from SW corner of the island	
	2030	BD	1	0	COTE on white buoy out in the bay	
26/05/07	1000	BD	4	4	4COTE flew from colony to E side of Bay, fishing and diving	4 crows around but not bothering them

Tern Observations						
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Observations/ Comments	
					Terns	Predators
26/05/07	1230	BD	2	1	Circling colony	HERG flying past colony
	1300	BD	2	4		2 crow flying past, 2 HERG circling colony ~2min and then flew away
	1412	BW	1	0	Tern flying off point	
	1437	BD	3	0	2 terns flew across bay, met 3 rd @ colony, they all circled a bit and then landed	2 pleasure boaters moored in Bay
	1515	BW	2	0	2 terns flew across bay, 1 appeared to be fishing	Pleasure boater still in bay
	1645	BW	3	0	3 circling around the nesting area	1 pleasure boater left
	1841	BW	1	0	Tern fishing just off point	
	2045	BW	1	0	Tern flying W off the point	
27/05/07	1230	BW	1	0	Tern flew from midway down point to end of point	1 pleasure boater moored in Bay
	1531	BW	3	0	Circling colony	
	1718	BD	2	0	Terns flew from colony over Bay, past camp and around the E side of Quaker	
	1724	BD	5	0	3 terns flew across bay towards colony, 2 more took off. The 5 circled the colony squawking but there wasn't anything around	
28/05/07	1206	BW/BD	3	15	Terns flying around colony	Sitting @ very end of point, 4GBBG, 3HERG, 4CORM, 4ABDU
	1802	BW	2	0	Flying from colony over bay	
29/05/07	830	BD	3	0	Flew over camp and landed in colony	
	1044	BW	1	2	Flew over camp and went to colony	Gulls at very end of point

Tern Observations						
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Observations/ Comments	
					Terns	Predators
29/05/07	1245	BW	3	0	Flew over camp and around the East side of Quaker	
	1419	BW	5	0	Flying just S of tern colony, circling about	
30/05/07	1230	BD	5	1	5 terns flying around colony squawking. 1 had a fish in its mouth, they chased it over the bay and around E side of island	1 CORM sitting on point uninvolved
	1500	BD	10	0	10 terns circling the colony	
	2020	BD	12	0	James and I took a little saunter down to the point and 12 terns started to circle the point in a defensive manor	
31/05/07	1600	BD	13	0	Circling colony squawking but no predators in sight	
	1921	JS	15	0	Going nuts at the point	Can't see anything that would cause the nuttiness
01/06/07		BD			Not much today, few terns flying here and there. Most active in the evenings	
02/06/07	1600	BD	20-30	0	Wow lots of terns circling the colony, can't see why, then they all landed	
07/06/07	1630	MD	2	0	Flew over camp- little activity @ the colony	
	2000	MD	4	1	Fishing in front of camp, attacking a seagull	The terns were harassing the seagull
08/06/07	1245	MD	1	0	Roseate! Flying over camp!	
	1430	JS	2	1	They were fishing near colony, then saw me and told me to leave	Me
09/06/07	1330	JS	3	0	Flew from colony, past camp. First sighting today.	
	2015	JS	1	3	Tern flew from colony to other side of camp	3 seagulls were chasing, making lots of noise
	2100	MD	4	2	Fishing in front of camp they like to sit on the racing marker	

Tern Observations						
					Observations/ Comments	
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Terns	Predators
10/06/07	1410	JS	3	14	Flying away from colony	
	1700	MD	2	0	Circling colony	
11/06/07	1915	MD	2	0	Fishing/sitting on buoys	
12/06/07	1400	MD	4	1	Attacking a crow in the colony	
15/06/07	1100	BD	7	0	Circling colony when we changed battery; some mating behavior	
16/06/07	1330	MD	1	0	Possibly a Roseate- long tail flying over soccer field	
	1600	BD	5	0	Flying around soccer field/colony chasing and diving	
17/06/07	1130	BD	1	0	COTE sitting on racing buoy, it sat there for a while and then flew around E side of the island	
	1315	MD	3	0	Fighting (flirting?) above hill between camp and colony	
18/06/07	1550	BD	1	1	1 tern flying over colony looking threatened	1 osprey hovering over tern colony, looked threatening, flew away shortly
19/06/07	2030	BD	1	0	Only tern of the day flew past camp	
20/06/07	1500	BD/JS	2	0	2 terns flew across bay towards Meisner's	
	1715	BD/JS	2	0	2 terns flying around by Woody Island	
	1755	BD/JS	6	0	Flew from Chester past the west point	
	1815	BD/JS	3	0	Flew from woody island to tern colony	Possibly same terns
	1820	BD/JS	3-6	0	Lots of tern action around tonight, flying around the bay squawking and diving	

Tern Observations						
					Observations/ Comments	
Date (dd/mm/yyyy)	Time (e.g. 23:00)	Observer	Max. # terns	# of Predators	Terns	Predators
21/06/07	1400	BD/JS	2	0	Flying across bay towards Meisner's	
	1721	BD/JS	2-3	0	Sightings of one or two terns flying around the bay at dusk	
22/06/07	1721	BD/JS	2-3	0	Same situation but less frequent	
23/06/07	1900	BD/JS	1	0	Sitting on buoy, flew around corner towards Woody Island	
24/06/07	2015	BD/JS	2	0	1 tern sitting on buoy, flew over towards colony, then flew around with second tern	
25/06/07	2000	BD	1	0	1COTE flying (with small minnow in its mouth) from racing buoy to colony and back several times; no idea why	
26/06/07	1620	JS	1	4	1 flying around W point, making noise	4 shaggs (CORM) sitting on W point; first time seeing them in a week
27/06/07	840	MD	1	0	fishing and sitting in front of camp	
28/06/07	1040	JS	1	25	1 sitting on racing buoy as usual	11 seagulls/14 shaggs sitting on W-point
	1445	MD	7	0	flying east over camp, squawking and fighting	
29/06/07	1425	JS	1	0	Our lone, consistent tern fishes in front of camp and sits on racing buoy	
	1815	MD	1	0	Poor lonely tern all by himself at the colony	
02/07/07	1930	MD	1	0	One tern on his racing perch. Hadn't seem him for 2 days	
06/07/07	1200	MD	1-2	0	I can hear one (maybe 2) terns but its too foggy to see them	
	1330	BD	1	0	1 tern seen through thick fog from baby barn door	
	1217	BD	2	0	2 COTE were in the bay for most of the afternoon fishing for what looked like 2-3 inch mackerel minnows	

THE QUAKER ISLAND REPORT

June 26, 2007

JUNE 12-19 CREW: MAGGIE & BRENNAN

Since the high point of tern sightings (May 30-June 2), there has been very little activity to report. All sightings have been less than 10 terns and mating or protective behaviour of the colony has steadily declined. The sightings have been much more passive and "passer-by" in essence than "I live here". This week had a high of 7 terns spotted at one time (June 15th) to a low of zero on June 13th and 14th. The maximum number of sightings in one day was 2, June 16th and 17th.

JUNE 19-25 CREW: BRENNAN & JAMES

With the exception of June 20th, the tern activity continued to decline. On the evening of the 20th, 4 sightings were recorded and the terns seemed to stay in the Bay for several hours, which they don't usually do. Most sightings are in the evenings. There was a similar but less impressive display on June 21st, although it was only a couple terns hanging around. That was generally the case for the rest of the week; when the temperature and wind drops in the evening is when there is the most activity but small numbers (1-3). There are no signs of nesting and no terns in or around the colony on June 22nd, when we went to look at the sound system where in the past there were. The overall bird activity in the Bay seems to be following the same pattern. Very small numbers of gulls and Cormorants relative to a month ago, and most bird sightings have been swallows, warblers, blackbirds, and finches.

THE QUAKER ISLAND REPORT

JUNE 19-JULY 3 CREW: JAMES SAXBY

Week 1: Not much to report for week one; sightings of two terns per day usually. They were always Common terns, one sitting on the racing buoy and the other trying to make the other one leave. We seemed to observe a decline in sea birds altogether.

Week 2: A general trend of increasing numbers of sea birds occurred. On the 28th (Thursday) there were 25 birds sitting on the end of the tern colony (combination of Seagulls and Shags). During the week there was only one tern (Common) who seemed to be delusional. It was squawking everywhere and at everything. We did not see any terns after the 29th (Friday), when boat traffic picked up for the long weekend. A number of seagulls came with the fishing/party boats. We found an egg shell washed ashore that looked like a tern egg and had goo in it.

ADDITIONAL ISLAND SURVEYS

THURSDAY, JULY 5, 2007

We did island surveys in Rick's boat. Matt, Bryan, Nicole and I. There were no terns found nesting on any islands except for Pearl. We checked all islands from the helicopter surveys done a month ago and there were no terns on any of them. Pearl seemed to have ~200 nests, ~400 eggs, and about a dozen chicks already hatched (some walking and some just out of the shell). With 200 nests for sure, tern numbers for Pearl Island should be ~500. We saw brown speckled eggs and grey speckled eggs, with one nest having a very light blue speckled egg in with brown speckled eggs. We collected a sample of the fish they were feeding on which were forming balls the size of a basketball in the water and the terns would find these balls of fish and just pick them off in a feeding frenzy. We have yet to identify the fish but we think the terns are following that species of fish and nesting where it is abundant. There were a lot of gull nests on Pearl as well and many chicks. We also saw Puffins and some other bird species.

Wendy: 73 nests, 143 eggs

Matt: 127 nests, ~254 eggs

6 nests total without eggs or chicks

Pearl Island Bird Counts- July 24, 2007

GPS coordinates: N 44°23.042' W 064°02.834'

Weather: foggy with light rain patches.

Time: morning, 9-12

When we arrived at Pearl it was quite foggy/overcast. There were various birds flying around but there was no actual flush when we arrived leaving it hard to determine if there were more terns (and other bird species) that remained on the island in their nests or if the numbers we were able to count are an accurate picture of Pearl. We tried blowing a horn but it did not have any effect. My concern is that if the terns did abandon (last trip we had 400-500), we may not find chick mortality due to the large population of gulls and other predators that would have eaten them, so determining fledging success in August could be difficult. I also received an email today from an Island Watcher saying that he has seen a lot of tern activity in the Bay in the last week.

Counts

Willetts -3

Black Duck- 1

Razorbills- 5

Puffins- 60

Spotted Sandpiper- 1

Semipalmated Sandpipers- 6

Ruddy Turnstone- 2

Double-crested Cormorants- 28

Guillemots- 100-200

Eider Duck- 1

Savannah Sparrow- 1

Terns- 20 (Common and Arctic seen, no Roseates observed)

Pearl Island Bird Count- August 15, 2007

GPS coordinates: N 44°23.042' W 064°02.834'

Weather: Sunny, a few clouds

Time: morning, 9-12

Pearl was actually visible this time! It was a very nice ride out in where we saw a flock of loons (~30), some dolphins, and perhaps a whale? It was something quite large coming out of the water anyway. We were able to land on Pearl no problem and we did a walk of the island. We first observed the area where the terns had been nesting in early July but there were no signs of chicks, egg shells, or anything. It is assumed that any chick/egg mortality would have been eaten by gulls and therefore unseen. There were a lot of gull chicks on and around Pearl, and they looked very healthy; obviously no problems finding food which I think was largely the tern eggs and chicks. The following birds were observed:

Puffins- 121

Spotted Sandpiper- 1

Semipalmated Sandpipers- 1

Ruddy Turnstone- 9

Black Guillemots- 149

Black-bellied Plovers- 3

Terns- 2

As a side note; on Friday, August 17th, one of our Island Monitors was out in her boat by Mason's Island and saw ~30 terns fishing and dive-bombing her boat. She didn't know if they had been nesting there or not but she was out in the middle of the water so it was assumed that they were fishing.