Gulf of Maine Seabird Working Group (GOMSWG)
23rd Annual Summer Meeting, August 11, 2007
Hog Island, Bremen, Maine

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The GOMSWG minutes report highlights from the 2007 nesting season such as productivity monitoring, feeding studies, and predator activity from various seabird colonies within the Gulf of Maine (GOM) through "Island Synopsis." A table including the 2007 GOMSWG census results and gull control efforts is attached to complement the island summaries. Abstracts and progress reports from research projects within the Gulf of Maine and surrounding areas are included in the "Research Presentations" section.

INTRODUCTION

Final 2006 tern numbers for the GOM are now available and indicate that the Gulf of Maine supported approximately 21,334 pairs of Common Terns (↑ 9% from 2005), 4,092 pairs of Arctic Terns (↓ 19% from 2005), and 371 pairs of Roseate Terns (↑ 5% from 2005). Laughing Gull numbers increased in 2006 to 5,033 pairs (↑ 6% from 2005) and 1,611 pairs of Least Terns nested last year (↑ 19% from 2005).

In 2007, terns nested at approximately 50 or more sites in the GOM from Nova Scotia to Massachusetts. Preliminary 2007 numbers show 21,162 pairs of Common Terns, 4,110 pairs of Arctic Terns, 393 pairs of Roseate Terns, 2,049 pairs of Least Terns, and 5,669 pairs of Laughing Gulls in the Gulf of Maine. Common Terns decreased slightly, but the number of Arctic, Roseate, and Least Terns and Laughing Gulls appeared to have increased in 2007. The most common prey items observed during tern feeding studies were hake, herring, and sand lance. Predators such as gulls, mink, peregrine falcon, and crows provided management challenges and made some aspect of predator control necessary for most sites in the Gulf of Maine.

Machias Seal Island did not support any nesting terns in 2007. This historically important site, especially for Arctic Terns, had another season of poor production and chronic gull predation. Nearly 3,000 pairs of Arctic and Common Terns have abandoned the island since 2005. There is great concern for the loss of Machias Seal Island and its inability to respond to management efforts to benefit nesting terns over the last 20 years.

Atlantic puffin and razorbill numbers continue to increase and the Gulf of Maine now supports over 4,000 pairs of puffins and 1,000 pairs of razorbills. Reproductive parameter estimates were variable between colonies, however with the exception of Matinicus Rock and Machias Seal Island, puffins and razorbills did well. Hatching, fledging and reproductive success estimates on Matinicus Rock were below short –term averages and on Machias Seal Island were among the lowest recorded since 1995. Larval fish predominated in the diet of puffins and razorbills on Machias Seal in 2007 and the continued prevalence of larval fish in seabird diet continues to suggest broader scale

problems for this region of the coast. Sand lance, hake, and herring were the dominant prey observed on Eastern Egg Rock, Seal Island NWR and Matinicus Rock in 2007.

SUMMER 2008

The 2008 GOMSWG meeting will be held on Tuesday, August 12th on Hog Island; after consecutive years of meeting on a Saturday, we will return to a week day meeting in 2008. The compiler for next summer's meeting minutes will be Mass Audubon.

PART 1 – ISLAND SYNOPSIS – from South to North

Monomoy Islands – Monomoy National Wildlife Refuge

Rachel Terry – Biological Technician, U. S. Fish and Wildlife Service

North Monomoy Island

Common Tern:

Census: On 2 July, two observers counted 8 Common Tern nests in the historic nesting area on the northwest portion of the island.

Productivity: An average of 30-40 adult Common Terns were generally observed in the nesting area throughout the season. Productivity was not quantitatively monitored, but nesting Common Terns on the island appeared to have been unsuccessful. Only two small chicks were found during the season and the nesting area was often impacted by tidal flooding.

South Monomoy Island
Common Tern:

Census: On June 15-16, a total of 7756 Common Tern nests were counted on the north tip of South Monomoy. The nesting area was delineated into 60 m^2 grids and nests were tallied by grid. A Lincoln Index adjustment brought the total to 7948 nests. This is a 14.6% decrease from the 9,310 nests counted in 2006. A second census was not conducted, but an additional 94 nests (23.1% of the total 407 nests) were initiated in productivity enclosures after the census window, indicating an additional 2387 nests in the colony after 20 June.

Productivity: The reproductive success of Common Terns on South Monomoy was poor, mainly due to heavy predation by coyotes, gulls, and Black-Crowned Night-Herons throughout the nesting season. Productivity was estimated based on 313 A-count nests in 34 fenced productivity enclosures located throughout the colony.

Average clutch size: 2.37 eggs/nest (SD = 0.70, N = 313 nests)	*2.32 in 2006*
Hatching success: 1.80 eggs/nest (SD = 1.06, N = 313 nests)	*1.88 in 2006*
Reproductive success: 0.70 chicks/nest (SD = 0.783, N = 313 nests)	*0.85 in 2006*

Number of pairs and productivity of Common Terns on South Monomoy Island 2003-2007

	2003	2004	2005	2006	2007
Number Pairs	8727	8864	8834	9310	7948
Productivity	1.26	1.59	1.44	0.85	0.70

Feeding Stints: Staff conducted 78 one-hour long Common Tern feeding stints from June 26 - July 30. An area of observation was defined by the observer and prey, prey length and recipient of prey was recorded during each stint. Sand lance was the most common prey item (85%). Other delivered prey items included herring, hake, bluefish and pollock. The average prey length was 2.35 inches and 92% of the prey items brought into the colony were delivered to chicks.

Adult Tern Trapping and Banding: Forty banded adult Common Terns were recaptured this season using treadle traps. Twenty-six recaptured terns that were trapped were originally banded at Monomoy NWR. The remaining recaptured terns were banded throughout the northeast, including Madison, CT, Great Gull Island, NY, Wareham, MA, and East Orleans, MA. Three Common Terns with Brazil bands were also recaptured. A total of 25 unbanded adult Common Terns were also banded opportunistically during trapping efforts.

Salmonellosis: *Salmonella* occurred again this season in the tern colony on South Monomoy Island from July 22-August 13. Approximately 50 Common Tern fledglings (15-23+ days in age) were found dead. Fledglings that were found dead of Salmonella generally had a normal outward appearance with no visible signs of injury or wounds. Some birds were observed prior to dying and often showed signs of imbalance and lethargy. They appeared droopy, were unable to open their wings and fly, and some had stained vents. Samples of dead birds were collected and sent to the National Wildlife Health Center in Madison, WI for analysis.

Roseate Tern:

Census: Two Roseate Tern nests were counted during the census on June 15-16. Observers continued to search for Roseate Tern nests throughout the season, but no additional nests were found.

Productivity: The Roseate Tern nests on South Monomoy were checked almost daily and monitored through chick fledgling age. The first Roseate Tern nest hatched 1 chick on 23 June; the second egg appeared to have also hatched, but the fate of the chick from this nest is unknown. The second Roseate Tern nest hatched one chick on 3 July, but the second egg from that nest was found depredated by Black-crowned Night-heron on 8 July.

Average clutch size: 2 eggs/nest (N = 2 nests) *1.5 in 2006*
Hatching success: 2 eggs/nest (N = 2 nests) *1.5 in 2006*
Reproductive success: 1 chick/nest (N = 2 nests) *0.33 in 2006*

Numbers of pairs and Productivity of Roseate Terns on South Monomoy Island 2003-2007

	2003	2004	2005	2006	2007
Number Pairs	3	1	1	2	2
Productivity	1.33	1.00	0	0.33	1.00

Least Tern:

Census: On 21 June, 32 Least Tern nests were counted on the northeast portion of the island. These nests were lost within 3-5 days. Refuge staff believe that these terns relocated to the southern portion of the island and joined some other Least Terns who also settled in the area. A B-count on 3 July comprised 49 Least Tern nests on the southeast and southwest beaches on South Monomoy.

Productivity: Productivity was not quantitatively monitored, but was estimated to be poor. Least Terns were impacted by gull and coyote predation in the northern and southern regions of the island during the nesting season.

Laughing Gull:

Census: On 15 and 16 June, 1498 active Laughing Gull nests were counted, which is similar to the 2006 count of 1492.

Productivity: Productivity was not monitored, but it was estimated to be qualitatively poor based on the number of fledglings seen at the end of the season. Nest destruction efforts were implemented again this season to reduce the increasing Laughing Gull population that is encroaching on the tern colony. A total of 1472 nests were destroyed in fifteen 60m x 60m grids during June 16-July 12.

Minimoy Island

Common Tern:

Census: On 19 June, 839 Common Tern nests were counted. No Lincoln Index was conducted to minimize disturbance. In 2006, 711 nests were counted during the census window.

Productivity: Productivity was not monitored. However, based on the number of chicks produced and survival to fledging, productivity was estimated to be qualitatively fair. Overwash and some predation by gulls and Black-crowned Night-herons impacted Common Terns throughout the season.

Roseate Tern:

Census: On 19 June, a total of 43 Roseate Tern nests were counted. One of the 43 nests was abandoned by mid-July. Thirteen B-count nests were found later in the season, two of which were later abandoned. Twenty-seven pairs of Roseate Terns nested on Minimoy in 2006.

Productivity: Productivity was estimated based on 33 A-count nests. Ten nests were not included in the productivity calculation because they were either abandoned or the fate of the nest could not be determined.

Average clutch size: 1.78 eggs/nest (SD = 0.42, N = 33)	*1.50 in 2006*
Hatching success: 1.36 eggs/nest (SD = 0.48, N = 33)	*1.32 in 2006*
Reproductive success: 1.18 chicks/nest (SD = 0.49, N = 33)	*1.21 in 2006*

Black Skimmer:

Census: On 19 June, 4 Black Skimmer nests were counted. One B-count nest (a re-nest) was found on 13 July. Minimoy has been the only nesting site in Massachusetts for Black Skimmers since 2003.

Productivity: Productivity estimates were determined based on 4 A-count nests.

Average clutch size: 3.40 eggs/nest (SD = 0.49, N = 4)	*3.75 in 2006*
Hatching success: 1.2 eggs/nest (SD = 1.3, N = 4)	*3.50 in 2006*
Reproductive success: 0.55 chicks/nest (SD = 0.55, N = 4)	*1.25 in 2006*

Laughing Gull:

Historically, Laughing Gulls have not nested on Minimoy Island. However, Laughing Gulls were seen loafing on the island, and 14 nests were found and destroyed in the Roseate Tern nesting area. No Laughing Gull chicks or fledglings were seen on the island.

Predators

***Great Black-backed Gull (GBBG) and Herring Gull (HERG)*:** Gull harassment in area A (gull-free zone) was initiated on 23 May. Two harassments were conducted in May, 7 in June and 1 in July. A census was conducted in Area B on 17 May - 18 nests (13 GBBG and 5 HERG nests) were counted. Eggs in Area B were punctured to suppress gull productivity. GBBG and HERG nests in area B were censused for a second time on 7 June - 8 new HERG nests were counted. A total of 30 GBBG eggs and 23 HERG eggs were punctured in Area B in May and June. Gulls were present in the tern colony mid-June through August. HERG were seen in the tern colony a minimum of 3 times and GBBG were seen in the colony at least 61 times. Gulls were responsible for taking at least 349 tern eggs, at least 18 common tern chicks and 2 common tern adults. A total of 19 GBBG and 2 HERG were removed from the colony this season.

Northern Harrier: A nest was not found, but based on Northern Harrier presence on South Monomoy Island it is likely that one pair nested on the island. Northern Harriers were seen in the tern colony a minimum of 4 times between 17 June and 9 August. At

least 6 adult Common Terns, 1 Common Tern chick and 5 Laughing Gull fledglings were found dead and likely killed by Northern Harrier.

Coyote: A total of 19 coyotes were removed this season: 4 in April, 4 in May, 10 in June, and 1 in July. Coyotes were seen in and around nesting areas on at least 3 nights and 7 times during the day. Evidence of coyote (scat, tracks – often seen in pairs) was found in or around the tern colony a minimum of 70 times throughout the season. There was evidence of coyote depredation on tern eggs, as well as eggs and chicks of other nesting birds including Piping Plover, American Oystercatcher, and Laughing Gull. Preliminary necropsy results showed one coyote stomach with at least 12 Common Tern chicks and evidence of egg consumption. A second coyote stomach also contained evidence of approximately 3 -4 Common Tern chicks. Additional coyote stomachs will be necropsied in the fall.

Black-crowned Night-Heron: Black-crowned Night-herons were censused on 20 May and 26 May during the refuge wading bird census. On South Monomoy Island, 94 pairs were counted, along with 45 pairs on North Monomoy Island. Black-crowned Night-herons were first seen in the tern colony on 5 June, and were observed at least 3 additional times during the day and at least 5 times at night during the nesting season. There was evidence of Black-crowned Night-heron predation on Common Tern eggs and chicks throughout the season. In addition, one American Oystercatcher chick was depredated by a Black-crowed Night-heron on North Monomoy. Two Black-crowned Night-herons were removed from the colony this season (one adult, one juvenile). A Common Tern fledgling was found in the stomach of the adult Black-crowned Night-heron.

Laughing Gull: Laughing Gull kleptoparasitism stints were continued this year. A total of 89 one-hour long stints were conducted in the tern colony on South Monomoy Island. Approximately 1040 kleptoparasitism attempts were observed and recorded for an average of 11.6 attempts per hour. Laughing Gulls were successful in 37% of the attempts, Common Terns were successful 28.7 % of the time, the outcome was unknown 25.6% of the time, and prey items were dropped in 8.4% of the attempts.

White and Seavey Islands, NH

Shoals Marine Lab, Cornell University
Project Coordinator – Dan Hayward
Field Biologists – Melissa Hayward and Susie Burbidge

Census: Fifteen people were on hand to conduct the census on June 12th, 2007. Three Shoals Marine Laboratory (SML) biologists, one New Hampshire Fish and Game (NHF&G) biologist, one SML Seabird Conservation Intern and the SML Seabird Ecology Class participated in the census. COTE numbers were up this year from 1736 pairs in 2006 to 2121 pairs. Roseate (ROST) and Arctic Tern (ARTE) nests were all marked and confirmed visually on or before June 20, 2007. ROST pairs increased from 33 pairs in 2006 to 52 pairs in 2007 and ARTE numbers declined from 6 to 5 pairs. On White Island, there was a significant increase in the number of COTE nests from 62 in

2006 to 204 in 2007. ROST and ARTE were not observed nesting on White Island in 2007. On July 8, a B-Wave census was "conducted" on White and Seavey Islands. An estimate of 418 new nests was based on new nests in productivity plots. One ARTE and Five ROST nests were initiated after the census period.

Census (6/12-6/20)

Species	COTE	ROST	ARTE
Date	6/12/07	6/20/07	6/20/07
A-Wave (ground count)=	1741	52	5
+ Lincoln's Index(269m,6um)=	1780		
+ White(204) + Plots(137)=Total	2121		
B-Wave (July 8)	418	5	1
Season Total Nests	2539	57	6

Year-by-Year Comparison (Census)

Species/Year	2002	2003	2004	2005	2006	2007
COTE (prs)	1273	2414	2582	2033	1736	2121
ROST	8	42	107	61	33	52
ARTE	1	4	5	8	6	5

Year-by-Year Comparison (Season Totals)

Species/Year	2002	2003	2004	2005	2006	2007
COTE (prs)	1687	2414	2582	2478	2463	2539
ROST	26	63	112	67	38	57
ARTE	1	6	7	9	8	6

Tern Productivity: COTE productivity increased from 0.60 in 2006 to 1.22 in 2007, whereas the clutch size decreased from 2.38 eggs per nest in 2006 to 2.27 in 2007. ROST productivity increased from 0.97 fledglings per nest, in 2006, to 1.25 in 2007. ARTE productivity increased in 2007 to 0.60 from 0.50 chicks per nest in 2006. The weather was mild during nest initiation with only 1.4 inches of rain from May 23 through peak hatch at the end of June. Most of the rain came from one storm on June 4th and 5th. The habitat on Seavey Island was manipulated last year at the end of the season. In August, NHF&G came out and applied herbicide (Round-up) to non-native plants in areas that were not used by terns during the 2006 breeding season. In early September a second application of herbicide was applied to the plants not killed by the first round of herbicide. At that time, some areas of ragweed were pulled up by hand. At the end of September NHF&G staff and a State of New Hampshire fire crew came out and burned the areas treated with herbicide. On April 16th a Nor'easter with 31.5 foot waves washed over parts of Seavey, scouring some of the organic material away from the rocks. COTE pairs increased 22.2% above the 2006 population and the nesting density was down in the productivity plots by 17.5%. The combination of good weather, abundant prey, and improved habitat conditions contributed to a successful season.

Predation on COTE eggs was observed in concentrated areas on the edge of the colony and it appears that many of the birds successfully re-nested. Gull predation was highest

during the early part of the field season as a number of "specialist" gulls hunted the colony, eating eggs, during storms in late May and early June. Similar to years past, it was not possible to document the number of eggs taken during the storms. The weather did not warrant spending time in and around the colony and in blinds. During the fledging period there was little predation. No more than 10 COTE tern pellets were found.

This year the majority of the COTE A-Wave hatched between June 22 and 26, peaking on the 23rd. In 2006, the majority of the eggs hatched between June 24 and June 27th, peaking on June 24th. The majority of the B-wave hatched between July 12 and 17, peaking on the 16th. The productivity for the B-Wave was 1.16 with an average clutch size of 1.88.

Tern Productivity

COTE A-Wave Totals [Season Totals]

Year	2002	2003	2004	2005	2006	2007
Nests Monitored	184	163	138	120	114 [163]	119 [145]
Mean Clutch Size	2.52	1.96	1.84	1.93	2.38 [2.17]	2.27 [2.19]
Mean Hatch	2.09	1.61	1.67	1.14	1.87 [1.48]	2.13 [2.02]
Fledglings/Nest	1.63	1.33	0.75	0.76	0.60 [0.47]	1.22 [1.21]
Total Fledglings	2075	3212	1936	1523	1041 [1158]	2588 [3047]
Total Population	5449	8040	7100	5585	4513 [6084]	6830 [8125]

ROST A-Wave Totals [Season Totals]

Year	2002	2003	2004	2005	2006	2007
Nests Monitored	8	30	55	56	33 [38]	52 [57]
Mean Clutch Size	1.38	1.40	1.21	1.23	1.48 [1.42]	1.62 [1.56]
Mean Hatch	1	1.07	1.13	0.82	1.24 [1.11]	1.42 [1.37]
Fledglings/Nest	0.88	0.87	0.95	0.70	0.97 [0.87]	1.25 [1.21]
Total Fledglings	7	26 [55]	52 [106]	46	32 [33]	65 [69]

ARTE A-Wave Totals [Season Totals]

Year	2002	2003	2004	2005	2006	2007
Nests Monitored	1	4	5	6	6 [8]	5 [6]
Mean Clutch Size	2	1.5	1.20	1.83	1.67 [1.75]	2 [2]
Mean Hatch	2	1.5	0.50	1.67	0.67 [1.0]	1.20 [1.17]
Fledglings/Nest	0	1	0.60	0.83	0.5 [0.75]	0.60 [0.50]
Total Fledglings	0	4	3	5	3 [5]	3 [3]

Tern Feeding Study

COTE

# Of Nests	Nest Hours	Feeding Rate
46	450.1	1.41

Species	Hake	Herring	Unk. Fish	Unk. Item	Mackerel	Sandlance
% of Diet	36.01	20.13	11.01	11.01	8.65	4.25

ROST

# Of Nests	Nest Hours	Feeding Rate
16	255.7	0.75

Species	Unk. Fish	Sandlance	Herring	Hake	Unk. Item	Mackerel
% of Diet	41.67	29.69	10.42	9.90	4.96	3.13

Note: There was a noticeable shift to Mackerel towards the end of July but it is not fully represented in the feeding study as the majority of the chicks were mobile and flying.

Predator Control: Biologists arrived on island on May 6. No gulls were nesting during the initial census of the islands. One HERG nest with 2 eggs was located on White Island and destroyed on May 19. Pyrotechnics and regular sweeps of the island continued from May 13 through the field season. Three GBBG and seven HERG were taken as a result of predation and non-response to all other control methods. Gull predation on eggs was heaviest during periods of strong winds in late May and early June. With winds in excess of 20kn, the gulls barely landed to predate a nest. Other than during these early storms, little predation was observed.

Predator Control

Species	Nests Destroyed	Eggs Destroyed	Adults Taken
GBBG	0	0	3(+0 relief kills)
HERG	1	2	7(+3 relief kills)

Gull Control (May14-Aug5)

Control Method	Avg/Day	Control Method	Avg/Day
Human Control	1.61	Relief Kill	0.04
Screamer	1.47	Shotgun	0.04
.17 Cal. Rifle	0.17	Nest/Egg Destruction	0.01
Banger	0.12	Cap	0.00
Problem Gull	0.12		

Other Nesting Species

Species	COEI	SPSA	MALL	SOSP
# Of Nests	~15	~15	2	2

Other Tern Sightings, Rare Birds, and Interesting Observations

CATE-5/24
ATPU-6/13, 6/15, 7/1, 7/6 (2), 7/9-10, 7/12, 7/28
COMU-6/13
COSH-7/11
BLTE-5/16, 6/26
RAZO-5/22, 6/8, 7/1, 7/9, 7/18 (2)
AMOY-5/31 (2), 7/8 (3)
MASH- 5/17, 7/28 (8)

PEFA-5/17-18, 5/27 LAGU-observed on 30 days

Stratton Island

Christina Donehower, Island Supervisor, National Audubon Society SRP

Census

A complete Common, Arctic, Roseate, and Least tern nest count was conducted in 2007. A total of 675 Common Tern nests were found on 16 June. After correcting for observer error (Lincoln index = 1.01) and adding 66 nests located in productivity plots and feeding studies, the adjusted total became 752 Common Tern nests. Arctic and Roseate tern nests were identified and flagged prior to the census, making species differentiation during the count unnecessary. Nest counts for Roseate and Arctic terns were similar to those recorded in 2006, while Common Tern nests increased by 12% (80 nests) (Table 1).

Least Terns nested on Stratton Island for the third consecutive year. Nesting was asynchronous since birds arrived in waves following predation events on mainland beaches. A colony-wide census was conducted on 13 June, and 75 nests were found. In a second census conducted on 27 June, 113 nests were found.

Table 1. Number of tern nests found on Stratton Island from 2002-2007

Year	COTE	ROST	ARTE	LETE
2002	1279	98	8	0
2003	305	40	4	0
2004	231	11	9	0
2005	156	2	3	19
2006	672	84	9	58
2007	752	80	9	113

Productivity

Common Tern productivity (fledglings/nest) was estimated from a sample of 66 nests in four fenced enclosures and three unfenced feeding plots, while 12 Arctic and 80 Roseate tern nests were monitored in unfenced habitat. Common and Arctic tern chicks surviving 15 days were considered "fledged", and any chicks later found dead were subtracted from this value. Roseate Tern productivity was calculated using methods developed by the Roseate Tern Recovery Team.

Compared to 2006, clutch sizes and hatching success were similar for Common and Roseate terns. Most Arctic Tern nests were located below the high tide line and washed out soon after egg-laying, which is typical for this species at this site. Common Tern productivity increased dramatically to 1.79 fledglings/nest, up from 1.00 in 2006. Roseate Tern productivity was 1.41 fledglings/nest, greatly exceeding the 2006 estimate of 0.96.

High chick survival likely reflected a combination of good food availability and low predation pressure early in the season. Many tern adults were observed carrying multiple fish at a time when delivering food to their chicks. Terns experienced little gull predation

in the egg-laying and incubation periods in June. However, gull predation increased in the latter half of July, and many fledglings were taken. Breeding parameters for Common, Arctic, and Roseate terns are summarized in Table 2.

Table 2. Breeding parameters for Common, Arctic, and Roseate terns on Stratton Island in 2007. Data for 2006 shown in parentheses.

Species	Clutch size	Hatching success	Fledging success	Nests monitored
COTE	2.55 (2.68)	2.37 (2.38)	1.79 (1.00)	67 (50)
ARTE	1.67 (2.00)	0.33 (1.44)	0.18 (0.00)	12 (9)
ROST	1.76 (1.87)	1.40* (1.44)	1.41 (0.96)	80 (77)

*Note that the apparent discrepancy showing lower hatching than fledging success is a function of the two different methodologies used to calculate these parameters.

Daily dusk counts were used to assess Least Tern productivity. A high count of 84 fledglings was obtained on 27 July. When adding a later (second-wave) high count of 24 chicks on 31 July, we (conservatively) estimate that productivity was approximately one fledgling/nest. A more precise estimate was not possible given the mobility of Least Tern fledglings, breeding asynchrony, and lack of a marked sample of chicks.

Tern Provisioning

Twenty-one Common, 14 Roseate, and a subset of Least tern nests were included in a chick provisioning study. Observers spent 1238 nest hours watching Common Terns and 285 nest hours watching Roseate Terns. Feeding rates (items delivered/hour) were 1.30 and 0.89 for Common and Roseate terns, respectively. Average prey size (measured in tern bill lengths) was 1.31 for Common Terns, 1.49 for Roseate Terns, and 1.27 for Least Terns. Hake was the principal prey item consumed by Least Tern chicks, comprising nearly 80% of deliveries. Roseate Terns fed primarily sand lance to their chicks, while Common Terns fed a variety of small fish and invertebrates, mostly sand lance, herring, and hake. Refer to Table 3 for an overview of diet composition by tern species.

Table 3. Principal prey items (percent) in tern chick diet on Stratton Island in 2007. *n* is the total number of prey items identified.

Prey item	COTE	ROST	LETE
Sand Lance	19.52	66.31	2.83
Herring	17.11	4.26	5.21
Hake	16.05	3.19	78.38
Lumpfish	0.22	0.00	3.22
Killifish	0.11	0.00	3.47
Invertebrates	12.92	0.35	0.51
n	1796	282	1554

Predator Activities and Control Efforts

Herring and Great Black-backed gull control measures included nest destruction, egg-poking, displacement walks, and shooting of predatory individuals. To prevent nesting

and to deter gulls from loafing in parts of the island, all Herring and Great Black-backed gull nests in Gull Meadow were destroyed and the area walked twice daily from 11 May – 7 August. All gull eggs on Bluff Island were poked during a census on 21 May and a follow-up visit on 14 June. Overall, 168 Herring Gull nests (228 eggs) and 199 Great Black-backed Gull nests (247 eggs) were poked or destroyed on Stratton, and 198 Herring Gull nests (429 eggs) and 155 Great Black-backed Gull nests (376 eggs) were poked on Bluff. Two Great Black-backed Gulls and one Herring Gull were shot. Several predatory gulls could not be removed and consumed many fledglings.

As in 2006, efforts were made to deter gulls from attacking Common Eider ducklings. Shots were fired at (or nearby) gulls seen actively harassing crèches to disrupt the predation event. There was no evidence of nocturnal predation or abandonment.

Common Eiders

A small-scale Common Eider banding and nest-monitoring program was continued this season. Twenty hens were trapped on the nest and banded. An island-wide nest census was not conducted due to time and personnel constraints; however, a count restricted to the south side of the pond revealed 115 nests (the same area had approximately 300 nests in each of 2004 and 2005 but only 40 nests in 2006). Clutch size and nest fate were recorded for a sample of nests. Overall, average clutch size was 4.27 (n = 41 nests), and 72% hatched at least one egg (n = 115 nests). Despite high hatching success and continued gull control efforts, most ducklings were consumed by Great Black-backed Gulls soon after hatching. Only four older (class II) ducklings were observed regularly.

Wading Birds

A wading bird census was conducted on 27-30 May in 30.4 person hours. Nest numbers for Snowy Egret (123 nests), Glossy Ibis (121 nests), Little Blue Heron (5 nests), and Black-crowned Night-Heron (25 nests) were all similar to previous years. The number of Great Egret nests appeared to decline (from 22 nests in 2006 to seven nests in 2007). However, the number of Great Egret nests may have been underestimated this season since many platforms were difficult to view, and several species have similar-looking eggs.

Black Guillemot

There was at least one active Black Guillemot burrow located in the South Rocks area of Gull Meadow. This burrow successfully fledged one chick. It is likely that another burrow was active on Bluff Island. Up to seven adult guillemots were observed.

American Oystercatcher

Three American Oystercatcher nests were initiated on Stratton and Bluff Islands. The two nests located on Stratton were unsuccessful, and the fate of the third nest on Bluff is unknown. Up to seven adults and one hatch-year bird were observed.

Other Notes

1) Stratton Island welcomed 271 visitors, including members of the general public and scheduled tour groups.

2) Sightings of rare or unusual species included:
Black Skimmer on 20 June
Bridled Tern on 16 July
Royal Tern on 16 July and 2 August
Stilt Sandpiper on 17 July
Yellow-crowned Night Heron observed regularly throughout July and August
Whip-poor-will on 2 August

Western Casco Bay

Maine survey by Bob Houston (USFWS); Survey date: June 15 & 18, 2007

Clapboard Island Ledge, south, Falmouth (55-330)
Nest survey by boat revealed no terns present. Last year's survey by boat showed no terns nesting.

The Nubbin, Yarmouth (55-223)
Nest survey by boat showed 1 pair of terns with 1 probable nest. Many (50+) eiders nesting/present. Last year's survey was 8 common tern nests and no nests the previous year.

French Island Ledges, Freeport (55-268, 55-269, 55-270)
Survey by boat, no terns seen. No terns on these ledges for the past 20+ years. No osprey seen this year; osprey nest with chicks seen last year.

Sister Island Ledge, Freeport (55-237)
Nest survey by boat – no terns seen. Last year 2 common tern nests were seen.

Grassy Ledge, Harpswell (55-259)
Nest survey on ground – no terns seen. No terns last year either.

Black Rock, Harpswell (55-252)
Survey by boat - no terns seen. No terns on this ledge for 20+ years.

Outer Green Island

Juliet Lamb, Supervisor

The 2007 field season was exceptional for Outer Green Island. Facing minimal predation pressure, fortunate in a robust food supply, and bolstered by habitat control that provided extra nesting space, Outer Green's tern colony enjoyed its most productive year since Audubon SRP began its re-introduction program on the island in 2002.

Census

The annual island-wide tern census was conducted on June 15th. Researchers counted 862 common tern nests, which was then multiplied by a Lincoln Index of 1.09, obtained via a mark-recapture count, to yield a corrected total of 936 nests. This represents an

increase of 28% over 2006, when 732 nests were counted, and approaching 2005's high of 971 nests. Clutch size, at 2.48 eggs per nest for 58 studied nests, increased over both 2006 and 2005 levels, and the colony appeared to be making more complete use of available habitat. More than 100 pairs nested on newly-created habitat, with 55 nests on areas that had been covered with landscape fabric and 47 on plots that had been treated with herbicide. Additionally, grid squares 1-7, which represent the northern edges of the island and were not used by terns in 2006, hosted 39 nests at census and an additional 30 post-census nests as of July 14th. Roseate tern totals held steady, at 7 census and 8 total nests, having not yet rebounded to 2005 levels. The average clutch size for roseate terns was 1.63.

Feeding and Productivity

Average hatch (2.24) and productivity (1.71) for common terns, over a 58-nest sample, were at their highest levels since 2003, when the colony contained less than 100 nests. Roseate terns hatched at a rate of 1.25 chicks per nest, with a productivity estimate of 1.36 based on the Roseate Recovery Team model. This success may have been due in part to the strength of the area food supply. Common tern chick diets included 38% hake and 22% herring, with amphipods representing 6% of deliveries and large fish, including pollock, Atlantic saury, and bluefish, near 10%. Roseate terns fed almost exclusively on hake (43%) and sand lance (30%) For both common and roseate terns, hake averaged approximately 1 culmen length in size, while herring and sand lance measured close to 1.6 culmen lengths. Flight line studies, newly instituted this year to provide a snapshot of tern foraging patterns around Outer Green, suggested that the colony forages primarily to the northeast, where over 45% of feedings were observed. Fish size also averaged higher (1.9 culmen lengths) in the north- and southeast than in other directions.

Predation

Aside from the high quality of the food supply, Outer Green's terns benefited from a year of low predation pressure. As in previous years, gull control included daily gull walks, as well as the destruction of all great black-backed and herring gull nests discovered on both Outer Green and neighboring Junk of Pork. Twenty-five nests were destroyed this year, the fewest in island history, and it was not necessary to shoot any predatory gulls. Other avian predators, such as night herons and raptors, did not interfere with the colony. Additionally, the colony's expansion into previously unused or unavailable habitat appeared to alleviate overcrowding, and researchers did not observe the frequent instances of intraspecific aggression typically reported. No major weather or disease events impacted breeding success this season.

Other Species

Common eiders also enjoyed a productive year, with 15 of 18 known nests hatching successfully and an average of 2.5 chicks per nest. No gull harassment or predation of ducklings was observed, and researchers frequently encountered older ducklings (size class 1c or larger). Black guillemot productivity, monitored for the first time this year,

was 0.83 over six nests. Leach's storm petrel social attraction continued for a fourth successive season: though no pairs nested, their distinctive odor was present around the speakers throughout June and July, and individuals called over the island on numerous occasions. During the last week of the season, petrels were captured over four nights using a mist-net. Researchers also operated a migration banding station on the island throughout May and early June. 636 birds of 60 species were captured, including such island rarities as a white-eyed vireo, a Nelson's sharp-tailed sparrow, a Cape May warbler, and a green heron. Other unusual birds were sighted throughout the season; notable among them were a little gull and a royal tern. For the second year running, a bridled tern spent several weeks on and around the island.

Summary Table: 2003-2007

	2003	2004	2005	2006	2007
COTE					
census count	94	497	971	732	936
post-census	66	185	--	--	115
Clutch	2.64	2.26	2.22	2.35	2.48
Hatch	2.45	1.92	1.69	1.92	2.24
Productivity	2.09	1.45	0.67	1.13	1.71
ROST					
census count	0	8	36	6	7
post-census	0	5	6	0	1
Clutch	--	--	1.47	1.4	1.63
Hatch	--	1.15	1.14	1.4	1.25
Productivity	--	1.0	0.97	1.47	1.36
COEI					
number of nests	0	17	9	13	18
successful nests	0	2	0	11	15
GULL NESTS DESTROYED					
GBBG	25	30	48	28	16
HERG	13	3	33	8	9
Total	38	33	81	32	25

Jenny Island

Alison Kocek: Island Supervisor

GOMSWG Census:

In 2007, 614 nests were counted with clutches between 1 and 4 eggs. After applying the Lincoln index correction, and taking into account the 51 productivity and feeding study nests, Jenny was estimated to have a total of 680 Common Tern nests. Roseate Tern nests were also counted and a Jenny Island record of 17 nests were discovered. Unfortunately, no Arctic Tern nests were present on Jenny this year. Data from the previous five years are as follows:

Table 1: Tern Census Nest Totals for Jenny Island from 2003-2007.

YEAR	COTE	ROST	ARTE
2003	468	1	0
2004	213	2	1
2005	532	11	0
2006	631	15	1
2007	680	17	0

Laughing Gull nests were also counted, 15 nests were counted during the census period with an additional 8 nests discovered throughout the rest of the year bringing the total to 23 LAGU nests. Other birds breeding on Jenny included: Common Eider, Spotted Sandpiper, Song Sparrow, and Canada Goose.

Tern Productivity:

Common Tern productivity was also on the rise this year possibly due to a steady supply of high quality fish, a low occurrence of predation, and most of the stormy weather occurring while the chicks were either young and could be sheltered under a parent or older and mostly feathered.. The exact statistics are as follows:

Table 2: Common Tern Productivity Data from 2003-2007.

YEAR	AVG. CLUTCH	AVG. HATCH	AVG. FLEDGE
2003	2.30	1.92	1.50
2004	2.35	2.13	1.13
2005	2.20	1.88	1.00
2006	2.47	2.20	1.05
2007	2.35	2.08	1.67

Roseate Terns also had a great year on Jenny Island with not only an all time high in number of nests, but also an extremely high productivity compared to previous years. Roseate productivity was calculated using a standard developed by the Roseate Recovery Team.

Table 3: Roseate Tern Productivity Data from 2005-2007.

YEAR	AVG. CLUTCH	AVG. HATCH	AVG. FLEDGE
2005	1.64	1.27	1.18
2006	1.45	1.36	1.00
2007	1.82	1.75	1.72

Feeding Study Data:

Feeding studies were conducted from three blinds on separate sides of the island (one on the south, one on the north, and one on the west side) with Common Tern observations occurring at each blind and Roseate Tern observations occurring only at the south blind. Specifics of these observations include:

Table 4: Feeding Study Data of Jenny Island Terns for 2007.

SPECIES	# OF NESTS	TOTAL HOURS	AVE. FEEDING

	OBSERVED	OBSERVED	RATE (PER HR.)
COTE	23	2311	1.37
ROST	4	230	1.96

Both species showed a strong preference for Hake with Herring a close second., but the rest differs. ROST also showed a strong preference for Sand Lance with other large fish such as Pollock and Atlantic Saury filling in the rest of the gaps. Common Terns, on the other hand, had a much larger range of diet including a steady supply of Lumpfish, Sand Lance, Pollock and various invertebrates.

Table 5: COTE dietary intake.

PREY ITEM	% OF DIET
HAKE	48.5
HERRING	24.2
LUMPFISH	3.1
SAND LANCE	2.5
POLLOCK	2.1
INVERTIBRATES	4.1

Table 6: ROST dietary intake.

PREY ITEM	% OF DIET
HAKE	55.3
HERRING	23.6
SAND LANCE	10.4
POLLOCK, SAURY	3.3

Predation:

Predation was relatively low. Some eggs and chicks were taken by gulls, resulting in the shooting of one HERG. Although LAGU do not normally predate on the tern chicks on Jenny they do kleptoparisitize the adults causing indirect harm to the chicks. Therefore, nests and eggs of LAGUs on Jenny Island were destroyed this year to discourage future breeding attempts and decrease reasons for kleptoparasitism. 21 of 23 LAGU nests were destroyed.

Trapping occurred this year on Jenny on two separate occasions. On 03 July07 a ROST adult was found dead with markings similar to a mink bite. Its chick, a female COEI and several tern eggs were also found killed/destroyed. Traps were set, but were not successful and no further instances of this type of predation ensued.

The second occurrence was on the night of 25 July07 possible involving an owl. In this instance, 2 COTE fledglings were found dead but not eaten amongst a spread of feathers. Traps were set for an owl but none were captured and (with the slight possibility of an instance the following night) no other occurrences ensued so those traps were discontinued as well.

Flight-Line Study:

A study was set up to watch incoming terns with prey items to try and discover if there was a certain spot they tended to fish from as well as if they tended to get certain species from certain areas. The data recovered wasn't entirely conclusive because the destinations of the most feedings seemed to switch from day to day depending on the weather, but, in general, feedings came in from the south end of the island which faces the open sea. It also seemed that, on average, most of the larger fish came from this side

of the island although small "mini hake," lumpfish, and invertebrates were carried in from all sides relatively equally.

Vegetation Management:

Despite wreaking havoc on most of Maine's coast, the Patriot's Day Storm was of great benefit to the terns on Jenny Island. It pushed back many of the weeds that were previously choking out potentially good tern habitat and allowed the terns a larger area to spread out on. This, in turn, lead to a decrease in the crowding that effected last year's birds and, therefore, a decrease in intraspecific competition for habitat which previously lead to terns practicing infanticide on infringing neighbors.

Another benefit to this years terns was the set up of landscape cloth covered in straw and wood chips. Before fabric placement a "weak" fire was set in late April on the south end. Without much ground fuel, the fire intensity was low. Four parallel strips of fabric were placed 12" a part. This kept large areas free of infringing vegetation and the terns readily nested on the fabric. A total of 63 nests were made on the cloth, 19 of which were included in a productivity plot. It seemed to work very well for the terns although, if it is used in the future, it would be best to add some extra forms of protection from weather (such as rock "caves") because death due to exposure seemed to be higher in this plot than in other areas of the island. Overall, the fabric seemed to work very well for the terns.

Pond Island NWR

Emily Tupper, Island Supervisor and Ryan Rice, Resident Intern, National Audubon Society SRP

GOMSWG Census

The 2007 GOMSWG census, conducted on June 19th, found 316 Common Tern and 3 Arctic Tern nests. These counts were not corrected using a Lincoln Index as adults were seen removing popsicle sticks from marked nests. This is the third highest nest total on record, topped only by the 484 nests found in 2006 and 429 nests found in 2004. The census also found 13 Common Eider nests.

Tern Productivity

Common Tern Productivity was measured from 30 nests containing 78 eggs in 3 fenced enclosures and at feeding studies. The average clutch was 2.5 eggs per nest, hatching an average of 2.4 chicks per pair. Final island productivity showed an impressive 2.03 chicks per pair. Arctic Tern Productivity was loosely followed and no known chicks fledged. The nests were not contained in a plot and it is possible that chicks survived to fledge.

Little chick mortality was observed; funk was present in 4 feeding study chicks and was not observed in other chicks in the colony. One funk chick recovered but was found as a fledger with a wing that could not be opened beyond 90 degrees. A total of 6 feeding study chicks disappeared and were assumed dead. Many nests in the same area moved dramatically, some out of the view of the blind. It is possible that these missing nests may have moved away from the blind area.

Feeding Studies

A total of 17 feeding study nests were followed. A new blind (Breeze Blind) was added directly west of the Coast Guard light tower. A total of 838 feedings were observed though the 800 observation hours logged. The feeding rate was 1.21 and the average prey length was 2.0. This was substantially larger than the average 1.62 bill lengths observed in 2006. Off-hand observations during logistics also showed large schools of small (1.5-2.5 bill length) fish gathering in the shallow waters of Kennebec Point. These data suggest that the mouth of the Kennebec was very productive for fish recruitment this season and may have played a large role in tern success this season.

Feeding observations showed large numbers of Hake, Herring and Sand lance being fed to chicks. Late season large numbers of adults were seen feeding Bluefish to 15-25 day old chicks. This dietary shift is presented in some late season feeding stints, but it is important to note that Bluefish may have played a larger role in chick diet than accounted for by these data. Table 1 summarizes prey frequency and percent of chick diet.

Table 1: Feeding Study Prey Frequency by Species

Prey Species	Total Items	Percent of Diet
Hake	290	35%
Herring	219	26%
Sand lance	215	26%
Unknown	61	7%
Bluefish	30	4%
Euphausid	12	1%
Atlantic Saury	7	1%
Pollock	3	0.40%
Lumpfish	1	0.10%
Total	**838**	

Predation

On June 8th, two Great Horned Owls (GHOW) were trapped on the swallow boxes. One owl was banded and successfully released in Rangely, ME. The other owl broke the trap free and was found drowned in the intertidal zone of the beach. It is important to note that owl traps should never be secured using rope and new supplies of chain will be needed to ensure safe trapping in future seasons.

One Herring Gull pair attempted to nest 3 times. They were actively discouraged and two eggs were destroyed on June 16th. Great Black Backed Gull (GBBG) presence became an issue around Common Eider hatch. On June 12th, two GBBGs were observed attacking a crèche of Common Eiders. A warning shot was fired and was effective in disrupting the attack. The two gulls were shot on June 13th where they were loafing on the island. One of the gulls was set atop "Gull Rock"; this example effectively removed gull presence for a week. There was no further evidence of gull predation this season.

Other Island News

Visitor and airplane disturbances were recorded throughout the season. Ten groups of visitors were intercepted in their attempts to land on the island and 13 aircraft flew close enough to disturb the birds. Conversations with the John James, Public Relations Officer at the Brunswick Naval Air Station resulted in a restricted air space that was placed around the mouth of the Kennebec for all Navy aircraft. A restriction on all aircraft could be instated annually by calling Gary Reado, at the Portland FAA Flights Standards District Office branch (207-780-3263). A "NOTAM" for restricted airspace can be created for the breeding season duration. This would also be a possibility for other islands that experience disruptive air traffic.

Kennebec River to Damariscotta River

(Survey by Bob Houston, USFWS and National Audubon crews from Pond I and Jenny I; 19 June 2007)

The highlight of this survey was 60+ northern gannet observations, with many flying along the boat (and passing us) at 35mph.

The following islands were surveyed by boat and no terns were seen. Brian Benedict of Maine Coastal Islands National Wildlife Refuge surveyed this area last year.

Pumpkin Island, Boothbay (65-28)
Outer Heron Island and ledges, Boothbay (65-279, 65-281, 65-282)
Inner and Outer White Islands, Boothbay (65-278, 65-276)
Thrumcap Island north and south, South Bristol, (65-266, 65-267)
Thread of Life Ledges, South Bristol (65-258, 65-257, 65-256)
Hypocrits, Boothbay (65-275, 65-272)
The Cuckolds, Southport (65-466)
Lower Mark Island, Southport (65-461)
Dry Ledge & Cat Ledges, Southport (65-453, 65-455, 65-454)
Sugarloaf Islands north and south, Phippsburg (73-213, 73-280)

Eastern Egg Rock

Supervisors: Jeff Kimmons and Matthew D. Martinkovic

Gull Removal:

In 2007 we removed a total of 7 territorial/predatory Herring Gulls and Great Black-backed Gulls. Two Herring Gull nests were also removed during the season. We removed a total of 811 Laughing Gull nests from the perimeter of the island which is known as the buffer zone. Researchers first removed 524 nests from June 19th – 20th. We later removed 287 nests on July 7th and 8th. In 2006 researchers removed 459 nests during the first census and 410 during the second census. Table 1 shows the 2007 gull removal data.

Table 1: Number of HERG, GBBG, LAGU nests and adults removed 2007

Year	Gulls Removed		Nests Destroyed		
	GBBG	HERG	GBBG	HERG	LAGU

2007	6	4	0	2	811

Census: June 19th – 20th

There was an increase in the number of nesting terns in 2007. The GOMSWG census was completed June 19th and 20th. A total of 1,139 total Common Tern nests, this was an increase of 376 pairs from the 2006 season. In 2007, 101 pairs of Arctic Terns nested (an increase of 21 pairs) and there were 118 nesting pairs of roseate terns in 2007, which was an increase of 5 nests from 2006. Laughing Gull numbers were up again in 2007; 1,705 pairs were counted an increase of 219 pairs from 2006. Table 2 shows the GOMSWG census data from the past 3 years.

Table 2: 2005-2007 GOMSWG Census results

Year	COTE	ARTE	ROST	LAGU
2005	758	81	136	1638
2006	763	80	113	1486
2007	1206	101	118	1705

Tern Productivity:

Common Tern productivity was 1.18 chicks/pair an increase from 0.64 in 2006. The mean hatch 1.75 chicks/nest and average clutch size 2.01 was an increase from 2006. Arctic Tern productivity was 0.97 chicks/pair which was an increase from 0.62 in 2006. The mean hatch 1.49 chicks/nest and average clutch size 2.00 was an increase from 2006. Finally, Roseate productivity was 1.06 fl/nest, which was an increase from 0.97 in 2006. The mean hatch and average clutch size were relatively the same as last season. Table 3 shows the results of the productivity of the three species of tern in 2007.

Table 3: 2007 Tern nesting results

Species	Productivity FL/Nest	Mean Hatch	Avg. Clutch
COTE	1.18 (67)	1.75	2.01
ARTE	0.97 (33)	1.49	2.00
ROST	1.06 (73)	1.20	1.51

Tern Feeding Study:

Once again the primary prey item was Hake in the 2007 season. There were a few other major prey items such as Atlantic Herring, Sand Lance, and invertebrates in 2007. Table 4 shows the break up of the major food items observed during feeding observations. A total of 1721 hours of feeding observations were conducted during the season. Table 5 indicates the total effort of feeding observations in 2007.

Table 4: 2007 Tern diet summary

Prey Items	ROST	COTE	ARTE
Hake	44.9	35.7	36.3
Unknown Fish	27.0	18.7	8.9
Herring	10.8	17.8	3.2
Sand Lance	15.3	5.7	0
Invertebrates	0	5.7	34.0

Table 5: 2007 Tern feeding study effort

	ROST	COTE	ARTE
# of Feedings	352	807	562
Hours Observed	351	562	266
Feeding Rate	0.96	1.42	2.09

ATPU:

In 2007 there were 90 active burrows, which is an increase of 8 from 2006. The productivity was not determined yet for 2007. Table 6 shows the number of active burrows over the past 3 seasons.

Table 6: 2003-2007 ATPU Nest Information

Years	Active Burrow #	Productivity
2003	59	0.89
2004	70	0.97
2005	71	0.86
2006	82	0.89
2007	90	0.93

Other Birds:

This season there were 60 species of birds seen on or around the island. Some of the highlights were Bridled Tern, Northern Fulmar, Sabines Gull and Razorbill. Razorbills were seen throughout the season but none nested. There were 81 Common Eider nest found on the island but this number is low due to no official census of the island. Eider ducklings were seen but most disappeared shortly after reaching the water.

Metinic Island

Katie Andrle – Island Supervisor, Betsy Dionne – Island Intern

Population Estimates

The GOMSWG census was conducted on June 21st and a total of 637 tern nests were counted during the census with a Lincoln index correction total of 659. This total represents an increase of 197 nests compared to 2006. The species ratio was calculated based on a sample of 318 nests which were visually identified to species resulting in a colony species ratio of 50.3% Common Tern and 49.7% Arctic Tern. Based on a comparison of species ratio from 2006 the increase experienced this year was an influx of Artic tern pairs while commons remained stable. After the GOMSWG census approximately 75-100 additional tern nests were laid. The total number of terns nesting on Metinic Island by species for the last five years is summarized in the table below.

Year	Common	Arctic	Roseate
2003	317	229	3
2004	331	392	1
2005	88	134	0
2006	322	138	2

2007	321	338	0

Productivity

Productivity Measure	Common Tern	Arctic Tern
Mean Clutch Size	2.0	1.7
Mean Hatch Date	27 June	25 June
Mean Hatching Success	75%	67%
Mean Fledge Success	56%	38%
# Chick Fledged/Nest	0.8	0.4

Even though the colony experienced significant growth in 2007, overall productivity for both common and Arctic terns declined compared to last year. Some chicks died due to starvation following a long stretch of dense fog and rain during the second week of July (15% of productivity plot chicks). The main limiting factor was predation by Merlin. Early in the season the Merlin took six adult terns then focused their attention on newly hatched chicks, especially Arctic tern nests that were exposed on rock ledges. Once chicks were large enough to move into the grass they usually survived.

Year	Common Tern	Arctic Tern	Roseate Tern
2003	1.52	1.28	1.33
2004	0.2	0.5	1.0
2005	0.3	0.05	no nesting
2006	1.73	1.0	1.0
2007	0.8	0.4	no nesting

Tern Feeding Studies

In order to quantify diet for Arctic and common terns, 16 nests were followed throughout the season; 6 were common tern nests and 10 were Arctic. The total number of observation hours amounted to 87 with a total of 673 feeding observed. The primary food item delivered was Atlantic herring (*Clupea harengus)* which made up 81% of the common tern diet and 74% of the Arctic tern diet. The second most fed item was marine invertebrates/insects which made up 6% of the common diet and 14% of the Arctic prey.

Diet composition and average length of prey species delivered to tern chicks on Metinic Island, 2007.

Species	Average Length	Common Tern		Arctic Tern	
		Total # of Feedings	% of Diet	Total # of Feedings	% of Diet
Atlantic Herring	1.3	277	81	245	74
Marine Inv./Insects	0.3	20	6	46	14

Butterfish	1.3	10	3	7	2
Pollock	1.6	9	3	0	0
Sandlance	1.6	4	1	3	1
Lumpfish	0.9	2	1	2	1
Bluefish	1.75	2	1	0	0
Red Hake	1	0	0	1	0
Halfbeak spp.	2.6	2	1	0	0
Unknown		14	4	29	9
Total		340		333	

Predators

We removed five gulls this season including one GBBG and four HEGUs. The only time during the season gulls were seen within the colony was in mid-June when three herring gulls were observed eating eggs. Thirty depredated eggs were found during the season. One herring gull was lethally removed and displayed on the rocks and was very effective in dissuading other gulls from entering the colony. No other gulls were observed within the colony the rest of the season.

The primary predator this season was a female Merlin. A pair of Merlins has nested on Metinic for several years, and in past seasons it has come later in July to predate some of the fledglings. This season it was observed predating adult terns before they initiated nesting and continued to predate chicks from a day old to fledglings. Chicks on the rocks were especially vulnerable, which included mainly Arctic Terns. To try and discourage the Merlin from entering the colony, we shot off bird bangers every time we observed it in the colony. The Merlin was observed in the colony 28 times and we shot 20 bird bangers at it. It was often seen several times a day if it was not successful. The bangers scared the Merlin away, but we did not notice a decrease in its visits to the colony. We observed the Merlin predate 11 adults and 15 chicks throughout the season, although many more are suspected.

Other predators we observed included European Starlings *(Sturnus vulgaris)*. Flocks of about 15-20 were observed in the colony on various occasions, and at least two eggs were found to be poked most likely by starlings. Garter snakes were observed eating two tern chicks this season. Ring-necked Pheasants *(Phasianus colchicus)* nested in the colony this season, probably due to increased vegetation growth with the absence of sheep. The pheasants were a problem because they caused the terns to flush and dive at them for several minutes while going to and from their nest. This could potentially be a problem if it occurred during inclement weather and terns were forced off their nests for an extended period of time.

Other

A total of 92 different species were observed on Metinic Island this season. There were many special sightings such as; Black Skimmer *(Rynchops niger)*, Caspian Tern *(Sterna*

caspia), Razorbill *(Alca torda)*, Black Tern *(Childonias niger)*, Eastern Bluebird *(Sialia sialis*), Atlantic Puffin *(Fratercula arctica)*, Black-billed Cuckoo *(Coccyzys erythropthalmus)*, Northern Mockingbird (*Mimus polyglottos)*, and many more. We confirmed breeding of Merlin, Osprey and many passerines. It was also the fifth nesting attempt this year by a pair of Bald Eagles in which the nest failed

Matinicus Rock NWR

Katie Kauffman, Supervisor

Tern and Laughing Gull Census

2173 tern nests counted during census (June 19-22) were multiplied by a Lincoln Index correction factor of 1.057, yielding a corrected census total of 2297 tern nests. 617 of these were Common Tern nests (determined by direct count immediately following census), and 1680 were Arctic Tern nests. Adding nests from study plots (not counted in census) yields overall totals of 1790 Arctic Tern nests and 663 Common Tern nests. The species ratio was 73% Arctic Tern to 27% Common Tern.

Breeding Laughing Gulls continue to increase in number on Matinicus Rock. 1101 nests were counted this year, which is a 20 percent increase over last year, and a 93 percent increase from 2004.

Productivity

Arctic Terns fledged 0.37 young per nest. Hatch success was 0.67 and fledge success was 0.38. Mean clutch was 1.47 for 110 nests. Fifty-three percent of clutches had one egg and 47 percent had two eggs.

Common Terns fledged 0.48 young per nest. At 0.81, hatch success was higher than that of Arctic Terns, but fledge success was lower, at 0.35. Mean clutch was 1.72 for 46 nests. Thirty-five percent of clutches had one egg and 61 percent had two eggs. One clutch had three eggs, and one had four eggs. No C or D eggs hatched.

Atlantic Puffins. Hatch success was 0.88 (n = 73), fledge success was 0.89 (n = 54), and productivity was 0.67 (n = 63). A pilot study was conducted to assess the feasibility of studying puffin chick growth rates. Chicks from nine burrows were weighed and measured every five days from hatch to fledge.

Razorbills. Hatch success was 0.82 (n = 74) and fledge success was 0.50 (n= 36). The fledge status of 25 hatched nests was unknown because poor weather prevented visiting the colony for long enough that chicks were small at one check and gone at the next check.

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Leach's Storm Petrels. Hatch success was 0.96 (n = 27). We banded 24 chicks and 13 adults. Twenty-one previously banded adults were recaptured in burrows.

Mortality

Weather. An overnight rainstorm on July 9-10, followed by two days of wet fog and cool temperatures caused mortality of small and mid-sized tern chicks. Numerous wet dead tern chicks were found in all parts of the colony.

Gull Predation. Predation by Laughing Gulls and Herring Gulls caused significant tern chick mortality. Though only one plot chick was observed being eaten by a gull, we suspect that gulls ate the majority of eggs and chicks in one productivity plot and one feeding study plot, as well as picking off late-hatching chicks in other plots. The tern nesting area expanded this year, encompassing areas in the northern half of the island that are not usually used by terns. However, no chicks were seen from these nests, and the eggs disappeared. Gulls (most likely Herring Gulls) may have eaten all these eggs. A Great Black-Backed Gull and a Herring Gull were each observed carrying off a Razorbill chick, and gull predation likely contributed to low Razorbill productivity.

Feeding Studies

Terns

Arctic Tern feedings were primarily hake (45%) and amphipod (15%). Average feeding rate was 1.29 deliveries/hour for 396 nest-hours of observation at 15 nests.
Common Tern feedings included hake (37%), amphipod (10%), and sand lance (10%). Average feeding rate was 1.01 deliveries/hour for 396 nest hours of observation at 13 nests.

Alcids

Puffin bill-loads consisted of 68% hake, 11% sand lance, and 3% herring. Less than 1% of items brought in were butterfish, Atlantic saury, pollock, lumpfish, larval fish, or euphausids.
Razorbills brought in the same prey items as did puffins, but bill-loads included less hake and more of several other species: 46% hake, 16% herring, 12% sand lance, 6% larval hake, and less than 5% each of euphausid, pollock, Atlantic saury, and butterfish.

Gull Control

Laughing Gulls

During census, eggs in 400 nests were poked to prevent hatching. Efforts were concentrated near dense tern-nesting areas. Many pairs continued to incubate poked eggs, but others rolled eggs out of nest cups in the week after poking. Some new nests initiated approximately three weeks after census may have been re-nesting efforts by pairs whose eggs were poked. One additional nest was destroyed after census, inside a tern productivity plot. One adult was shot after it depredated multiple tern eggs.

Herring Gulls and Great Black-Backed Gulls
Four Herring Gull nests were destroyed. At least one nest was missed, as a large chick was later seen in the far northern part of the island. Three Herring Gulls were shot. No Great Black-Backed Gull nests or chicks were found, but one adult and one immature were killed.

Unusual Birds

A **Red-billed Tropicbird** was observed on 27 days and landed on the island on four occasions.

Manx Shearwaters were heard on 18 of 30 nights on which we listened for their calls. A maximum of three distinct individuals could be distinguished. A maximum of 19 individuals were seen from the island at one time.

Seal Island National Wildlife Refuge

Island Supervisor: Matt Klostermann
Resident Intern: Jennifer Malley

Tern Census
Due to safety concerns on the island, a complete tern census was not conducted in 2007. However, a partial census was done and the total number of nests in these areas was determined to consistently represent, on average, 36.7% of the total nest number of the colony over the past six years. Therefore, we used the partial census nest total to estimate the total nest number in the colony. Also, due to gull predation, one census was conducted on June 21, during the GOMSWG census window, and a second census was conducted on July 1, just before hatch (see Predation section below). The total nest number of nests during the GOMSWG census window was approximately 1,627. The total number of nests just before hatch was approximately 1,828.

Table 1. Number of nests per species from 2002-2007. 2007 numbers are from the second census, conducted just before hatch.

	2002	2003	2004	2005	2006	2007
Arctic Tern	1046	1066	1172	1064	1015	823
Common Tern	1568	1283	1167	1219	1726	1005
Roseate Tern	0	0	0	0	1	0
Laughing Gull	0	0	5	0	0	0

Tern Productivity
Tern productivity was fairly low in 2007. A long period of fog and rain began on July 5, just before peak hatch. 71.43% of Arctic Tern chick mortality and 75.0% of Common Tern chick mortality was due to exposure.

Table 2. Number of chicks fledged per nest for Arctic and Common Terns from 2002-2007.

	2002	2003	2004	2005	2006	2007
Arctic Tern	1.15	0.98	0.81	0.67	0.72	0.67
Common Tern	1.21	1.06	0.68	0.58	0.94	0.66

Tern Feeding

Tern diet was composed mostly of Euphausids, which were abundant very close to the island. Large feeding flocks of terns and other species were seen feeding on Euphausids less than 200m from the island daily throughout July. More herring was seen coming into the colony from about July 29 to the end of the season.

Table 3. Major prey species and percentage of diet for Arctic and Common Terns.

	Euphausid	Hake	Herring
Arctic Tern	54.98	16.61	0.86
Common Tern	67.4	8.75	3.64

Predation

Gull predation in 2007 was severe. A group of 20-30 gulls, mostly Herring Gulls, moved into the colony at first light several days in a row from about June 4 to June 8 and consumed all of the tern eggs present. On June 9, there were 0 tern nests left in the colony. The terns began re-laying on June 11. Gulls were seen in the colony predating tern chicks nearly every day of the summer – often several times per day.

Table 4. Gull control measures in 2007 by species

	# Nests Destroyed	# Shot
Herring Gull	119	11
Great Black-backed Gull	81	1
Laughing Gull	0	2

Atlantic Puffins

The number of active puffin burrows was estimated to be about 300. Our high count of puffins was 701, which was up from 450 in 2006. Puffin productivity was estimated to be 0.86 chicks/pair as compared to 0.88 chicks/pair in 2006. Puffin chicks' diet was composed of 43.19% Hake and 40.05% Sandlance.

Black Guillemots

A pilot study began this year to determine the productivity and growth rate of guillemots. Productivity was determined to be 0.22 chicks/pair. A long period of wet, cold weather arrived just as the guillemot chicks were hatching. Since the guillemot burrows on the island are fairly shallow and exposed, many of the chicks died from exposure. Several burrows were flooded and the eggs never hatched.

Razorbills

A total of seven active Razorbill burrows were found on the island. Three of these burrows had 2 egg clutches, none of which hatched. Razorbill productivity was 0.2 chicks per pair.

Common Eiders

A total of 35 nests were counted in late May, although their main nesting area (Area 4) was not counted to minimize disturbance to the birds. The high count for ducklings was about 125, however, only 3 ducklings were seen that survived beyond the very small, downy stage as a result of gull predation.

Bird Sightings

A Red-billed Tropicbird was seen on the island again this year. It was first seen on June 16 and was last seen on August 8. It visited a total of six times.

East Penobscot Bay – Brad Allen ME&IFW

TERN CENSUS AND SEASON SUMMARY – 2007 GOMSWG

SUBMITTED:
Brad Allen_____

Census Date	Island Name	COTE #	ARTE #	ROST #	Island Census Method *	Productivity ** FL/Nest	N	SD
6/14	Hen Island Winnegance Bay - Phippsburg	55			N	????		
6/19	Hardhead Is. Deer Isle	93			N	Yes, as of July 7		

For species counts where the Lincoln Index has been applied, please list the original count followed by the adjusted count (e.g. 100/113)

***** CENSUS METHOD: Please use letter codes as listed:

N = Nest count **VE** = Visual estimates from the island (# of individual birds)
NP = Nesting Pairs (from visual estimates) **VEB** = Visual estimates from a boat (# of individual birds)

****** PRODUCTIVITY:

FL/Nest = Average number of fledglings per nest should be expressed as follows: e.g. (0.6) = 0.6 fledglings per nest. List high counts of fledglings in brackets when detailed productivity estimates are not available. Use "-" to indicate insufficient data. **NOTE:** 15-day-old COTE and ARTE chicks are considered fledglings for GOMSWG productivity estimates. ROST chicks are considered fledged at 5 days.

N = Number of nests used to determine island productivity (sample size).
SD = Standard deviation

Method (list all numbers that apply): 1 = Feeding study; 2 = Fenced Plot; 3 = Unfenced Plot

+ CLUTCH SIZE (include if available):

Clutch size is pooled from feeding and productivity numbers.

N = Sample size

x = Mean clutch size

SD = Standard deviation

Census Date	**Island Name**	**COTE #**	**ARTE #**	**ROST #**	**Island Census Method ***	**Productivity ** FL/Nest**	**N**	**SD**

GULL CONTROL DATA

Island Name	**Gulls Killed**		**Nests Destroyed**	
	HERG	**GBBG**	**HERG**	**GBBG**

Observations of Seabirds, particularly Great Cormorants and Terns, in mid coast Maine during the summer of 2007.

Supported by the Maine Department of Inland Fisheries and Wildlife
Observer John Drury, P. O. Box 102 Vinalhaven 04863.

Mink/Guillemots:

After seeing two Mink ashore on Brimstone during August of 06, and sign of them there in January 07, mink traps were set on Brimstone between April 10 and May 21,and Otter Islands April 10- May 14, There were 7 traps set on Brimstone, 3 or 4 on Otter.

A dead mink was found ashore at Brimstone in January. Two Mink were Killed at Brimstone and two at Otter Island, there were five pairs of Petrel wings belonging to birds recently eaten found by two observers on May 2 and on May 9th there were @15 scats found with petrel feathers in them. There was no such evidence seen on Brimstone, nor sign of Petrels breeding there in August.

There were plentiful guillemot chicks found at Brimstone August 4. Adult Guillemots were seen carrying feed into nesting sights while passing Otter Island during the first week of August.

Terns:

Wooden Ball:
June 11, 35 Arctic terns,
June 15, @40 arctic terns , 10 common terns in the nesting area 100 meters NE of the landing beach.
17 nests with one egg, 3 nests with 2 eggs, 1 nest w/3 eggs, 3 eaten eggs.
Down the Island, beyond Mertensia beach, 5 adult Arctic terns, 1 nest with one egg, 1 nest w/2 eggs.
Total 23 nests.
June 23, 50 adult terns jumpy there was a crow in the colony,
June 29, 4 adult near the area where two nests were found.
150-200 adult terns @3/4 arctic, 39 nests w/ 1 egg, 81 nest w/ 2 eggs, 7 nests w/ 3 eggs,
Total 127 nests found,
July 24, 70 adult terns roosting, on shore feed coming in,
I saw terns diving on a black back, 0 chicks seen. 3 adult seen at the second nesting site,
July 31, 2 fledgling arctic tern, no common tern seen, there are only a few still up in the nesting area. There were15 adult roosting on the shore. This colony has done poorly.

Great Spoon:
June 8, 2 adult common terns over the spit.
June 19, 15 adult common terns on the spit.
Search of the nest area, 2 nests with 2 eggs found,
2 nests found with no eggs but egg slime in the cup, also 15 scrapes, imm. And adult eagle.

July 21, no terns seen.

Eastern Cow Pen:
June 19, 50-60adult common tern,
14 nests w/ 1 egg, 28 nests w/ 2 eggs, 10 nests w/3 eggs, one broken egg.
Total 52 nests with eggs found.
July 21, adult eagle, 0 terns, this colony failed.

Western Cow Pen:
June 19, @ 30 adult common terns,
6 nests w/one egg, 19 nests w/ two eggs, 2 nests w/ three eggs,
one broken egg, 2 scrapes. Total 27 nests with eggs found
July 21, 2 adult eagle one from the eastern pen, 0 terns, this colony failed.

Mason Ledge:
June 8, 8 common terns over the eastern end.
June 19, 0 Terns seen.

Brimstone Ledge: (Burnt Coat harbor)
June 8, @60 common terns attending.
June 19, @75 adult common terns estimate @60 nests
July 21, terns present and apparently thriving they did not all flush
August 3, @30 common tern, 4 fledgling seen.

Dry Money Ledge:
June 8, 150-180 common terns.
June 19, , @200 adult common terns,
37 nests w/ 1 egg, 35 nests w/ 2eggs, 14 nests w/ 3 eggs, 1 nest w/ 4 eggs, total 87 nests.
the beach pea stand was reduced doubtless by the patriots day gale.
Many eggs were amongst the rocks without near cover.
July 21, 7 terns total, this colony has failed.

High Sheriff:
June 8, 30 common terns
June 19, High Sheriff, 25 adult common terns, 6 nests w/ 1 egg, 14 nests w/ 2 eggs, 4 nests w/ 3 eggs. 2 broken eggs. Total 24 nests.
July 21, 0 terns ashore, this colony had failed

***Three Bush Island*:**
June 8, one common tern.
June 19, @120 adult common terns,
19 nests w/ 1 egg, 54 nests w/ 2 eggs, 14 nests w/ 3 eggs, one broken egg,
total 87 nests with eggs found.
There were two gull nests found on the island, a black-backed gull one egg piping, and a herring gull nest with one egg, there was also a broken gull egg found,

July 21, 35 adult common tern, east side, @ 15 roosting, 2 tern chicks seen,
40 common terns roosting on the western shore, @120 terns on the west side, @160 total.
There were several feedings seen, large nice fish, @12 chicks seen on the west side, this colony is doing well.
August 3, @120 adult common terns, 5 fledglings seen, this is a vigorous healthy colony,

No terns seen:
Little Spoon, White ledge, Green Ledge (Fog Island) Carvers, Roberts', Little Roberts, Hay, Otter, Brimstone. Southern Poplestone ledge, Little Two bush, Crescent, Marblehead, Fisherman's, Oak, Hog island (Metinic), Little Green Island, Large Green island, no Man's Land, Two Bush (Matinicus), Saddleback (Jericho bay), Saddleback (Penobscot Bay) Heron Island, John's Island, Green Island (Burnt Coat Harbor), Gooseberry (Burnt Coat Harbor). Crow Island, (near ferry landing Swan's Island) Egg rock (west of Casco passage) Medric rock, green ledge east side of Vinalhaven, green ledge west side of Vinalhaven,

Great Cormorants:

Summary: There were a total of 90 great cormorant nests counted at five sites on the 8th and 9th of June**.** There were 97 in '06, @260 in '92.

There were 14 nests counted at Little Roberts, 21 at Seal, 25 at the White Horse, 21 at Brimstone ledge, and 9 at Southern Mark. There were only four GC nests left at Southern Mark on June 19.

Those at The White Horse had been abandoned by July 2,1 there were at least 9 eagles on nearby Great Spoon Island on that date. There was also evidence of eagle foraging on cormorants at Brimstone, Southern Mark and Little Roberts. Eagles did not start focusing their foraging on the cormorants on Little Roberts until @ Aug 23 after the gulls had largely dispersed from Roberts, the eagles foraging attention focused on young gulls until then.

Little Roberts
April 10, 20 adult great cormorant, several displaying
April 14,15 adult GC, 3 on nests
April 22, 18 GC several displaying.
May 2, 22 adult Great Cormorant, 9 nests.
May 9, 21 adult GC. and 12 nests.
May 14, 24 adult great cormorant 10 nests
May 30, 12 GC nests,
June 9, 14 GC nests, 35+ Double-crested cormorant nests
June 21, 10 GC nests.
August 1, @25 GC chicks, seen, they are doing well @3/4 adult size.
August 24, 15 Great cormorant Chicks.

4 immature eagles on Little Roberts, the gulls have backed off, the eagles can roost on Roberts now, there were none roosting there on Aug 22. Otter Island, 6 more eagles.
August 28, 3 immature eagles on Roberts' and little Roberts', the young cormorant are on the shore as they have been since august 24.
Sept. 4, 5 GC chicks. There were also 2 GC chicks seen on Yellow rock @1/4 mile from Little Roberts'
Sept. 18, 4 adult and one GC chick

Seal Island:
May 21, 24 adult GC, 17 GC nests.
May 30, 20 GC nests, 11 DC nests.
June 9, 21 GC nests, 9 double-crested cormorant nests
July 1, 17 Great Cormorant nests, some chicks @1/3 adult size, 18 Double-crested nests,
Aug 2, @32 GC chicks,
August 22, @30 of this years GC. chicks on the western head

The Black Horse:
June 8, 14 double-crested cormorant nests.

The White Horse:
June 8, 65 adult GC, 22 nests.
June 19, 32 adult GC on the southern half, 35 adult on the northern half.
23 GC nests form the west and 2 more from the east,
1 imm. GC. an adult carrying nesting material, another adult displaying.
July 21, 8 adult and 1 imm. GC the nests have been abandoned. There were at least 9 Eagles 3 adult and 6 imm on nearby Great Spoon Island.

Brimstone Ledge, (Burnt Coat Harbor):
June 8, 19 GC nests, 4 DC nests, from South, 39 adult Great corm.
2 more GC nests form north and 1 more DC, total, 21 GC nests 5 DC nests.
June 19, 18 GC nests, 42 adult GC, one adult displaying, 8 DC nests
July 21, @ 40 GC chicks, at 18 nests, 6 DC nests, GC chicks 2/3 - 3/4 full size,
August 3, 43 GC chicks at @13 nests, 11 adult GC, 2 of them broody, @12 DC nests visible,
August 29, 12 immature GC of the year on the shoreline, the eagles have driven them off the nest platforms., 3 adult GC. 5 DC. There were 5 adult and 4 GC chicks seen on the NE corner of Heron Island ¼ mile from Brimstone.

Southern Mark Island:
June 8, From east 160 DC nests and 9 GC nests.
from the west, @110 DC nests, imm eagle passes over flushes the gulls.
June 19, 4 GC nests on the east side, 150 DC nests,
2 adult GC NW shore 0 nests, @100 DC nests,
July 21, 11 GC chicks at 4 nests,
@155 DC nests on the eastern shore, many large chicks, @100 DC nests from the NW.
August 3, eagle flies over flushes gulls 6 GC chicks seen,

most of the cormorant chicks on the shoreline, one bunch of GC chicks still in their nests. 4 adult GC seen from the east.
August 29, @60 imm. DC. on the east side, 0 GC imm seen.
25 imm. DC. from the west, 0 GC.

Western Green Island: (east of Swan's island), **June 19**, 0 cormorant

Eastern green Island: (east of western green) **June 19**, 15 dc nests, @40 adult DC, 6 imm. GC.

Metinic Green Island:
June 20, 4 adult, 1 imm. GC. Fog prevents a count of the DC nests.

Fisherman's Island:
June 20, good strong bird island.
5 DC nests SW corner, gray seal eating flounder.
5 snowy egret, there were two others that flew off the island,
At least 2 snowy egret nests in the spruce trees.
100 DC nests on the eastern shore, large chicks, @1/3 adult size. 0 GC nests.

No Man's Land:
Sept. 5, 5 GC chicks presumably from Seal or little Roberts.

There were no Great cormorant nests seen at: Little Spoon, Great Spoon, Spirit Ledge, John's Island, Mason Ledge, Saddleback ledge (Jericho bay) Metinic Green, Green Ledge (off Fog Island), all recent nesting sites for this species.

Also No Great Cormorant nests at: Green ledge (east side of Vinalhaven) Green ledge (West side of Vinalhaven), Green ledge, (Criehaven), Shabby island. Wooden ball, Little Green, Crescent, Oak, Marblehead, Fisherman's Island, No Man's land

Petit Manan Island

Adrienne J. Leppold, Island Supervisor

Census: During the GOMSWG census, which was conducted on 19 and 21 June, we surveyed the entire island and counted all tern, Laughing Gull and Common Eider nests. We counted a total of 2,306 tern nests. We applied a Lincoln Correction Factor of 1.04 to all nests counted outside the productivity plots. Our corrected grand total was 2,386 tern nests. This was the largest count ever on the island since it has been managed by the FWS. This was an increase of 0.2% from last year and 48% over 2005. We confirmed tern species for 897 nests (37.5% of the colony). From that, we estimate that Arctic Terns (ARTE) made up 43.6% of the colony and Common Terns (COTE) comprised 56.4%. Incidentally, this was also the densest ARTE population ever on the island. The island supported only five pairs of Roseate Terns (ROST), and, at least, two of them are believed to be relays from pairs that failed earlier in the season. Lastly, we counted 49

Common Eider (COEI) nests. Note that the Laughing Gull (LAGU) total in the table below reflects a corrected value by 15%.

Year	COTE	ARTE	ROST	ATPU	LAGU
2003	1213	799	31	28	1123
2004	1312	911	29	35	1042
2005	1007	595	9	51	1151
2006	1602	779	23	66	1282
2007	**1343**	**1038**	**5**	**54**	**1350**

Tern Productivity: Despite the large colony this year, productivity decreased for all species. In fact, ARTEs and ROSTs experienced the lowest reproductive rates in, at least, the last five years. Weather did not seem to play a large role in productivity this year, so we attribute much of the failure to disturbance (see avian disturbance).

Productivity Measure	2003	2004	2005	2006	2007
Mean Hatching Success	100 (COTE) 95.2 (ARTE) 73.0 (ROST)	87.0 79.0 82.0	92.0 81.0 89.0	78.0 83.6 81.8	**65.2** **51.9** **50.0**
# Chicks fledged/nest	1.84 (COTE) 1.21 (ARTE) 0.55 (ROST)	0.62 0.77 0.62	0.51 0.51 0.22	1.18 0.84 0.78	**0.76** **0.45** **0.16**

Diet Composition: While the primary prey species delivered to both ARTE and COTE chicks was Atlantic Herring (*Clupea harengus*), the percentages given in the table below are underestimated due to a large number of unknowns by one observer. "A" chicks received 78% and 69% of food deliveries, while B chicks received 15% and 29% of the food deliveries (COTE and ARTE respectively). We followed a total of 20 nests, ten of each species, for 1173 hours. The average number of food items delivered/hour/nest for COTEs was 0.5 and 0.8 for ARTEs. One Atlantic Saury was observed being fed to an ARTE chick and both species of terns, on a number of occasions, were observed bringing in multiple fish at one time. The maximum observed was four herring carried by one COTE adult.

Diet Item	% COTE diet	% ARTE diet
Herring	67.1%	49.1%
Sandlance	5.2%	14.5%
Bluefish	6.8%	3.7%
Invertebrate	0.4%	3.5%

Metapopulation Project: As part of this project, we trapped and banded 449 terns, both adults and chicks. 147 were ARTEs, 301 were COTEs, and we banded one ROST chick. We used a combination of mist nets, modified bow net traps, and raised manual bow net traps to catch adult terns this season. We also resighted a total of 278 birds, including

200 ARTE, 72 COTE and 6 ROST. We were excited that four of the COTE resights were birds banded in Brazil and Argentina.

Alcids: We confirmed 54 active Atlantic Puffin (ATPU) nests and 43 Black Guillemots (BLGU). We believe the main reason for the decrease in alcid burrows this year were winter and early spring storms that tossed around many of the rocks on the island. We found a number of the historically used sights caved and/or filled in.

We confirmed one pair of nesting Razorbills (RAZO) that had an egg when we arrived to the island on 21 May. We believe it failed and the adults attempted to renest. It appeared that the 2nd egg was pushed out and the burrow was reclaimed by an ATPU. The high alcid counts for the season were 302 ATPUs (2 August), 90 RAZO (13 June), 5 Common Murres (24 June), and 505 BLGUs (6 August). We banded 27 ATPUs (22 chicks and 5 adults) and 19 BLGUs. One of our six ATPU recaps was actually one of the original chicks reintroduced to the Gulf of Maine from Nova Scotia in 1989. This was the first confirmed breeding of an original chick on Petit Manan.

Predation and Gull Control: In a continued effort to minimize LAGU nesting distribution and predation, all but the central part of the island was maintained as "gull-free." We destroyed a total of 720 LAGU nests and two Herring Gull (HEGU) nests. We lethally removed 38 LAGUs, 1 Great Black-backed Gull, and 7 HEGUs from the island. We documented a minimum of 80 depredated nests by gulls and observed, at least, one instance of a LAGU taking a tern chick.

Avian Disturbance: Disturbance this year by avian predators was very significant. Because spring storms wiped out many of the nearby Bald Eagle (BAEA) and Peregrine Falcon (PEFA) nests, their numbers and frequency on the island was much higher than in previous years. BAEA visited PMI and nearby Green Island a minimum of 55 times, with a maximum of 11 individuals observed at one time. While they did not focus on the terns, their continued presence hunting COEI and LAGU on and around the island consistently kept the birds very flighty. PEFA visited the island a minimum of 107 times. Unlike previous years, the birds spent a lot of time perched on the island and often ate kills on the island. This caused prolonged disturbance of the colony and is believed to be a major factor in the reduced success this year. We also attribute much of the abandonment observed by ARTE, in particular, to the PEFAs presence. We documented a minimum of 37 predation events by the PEFA on both adult and fledgling terns.

Other Important Information: Incidental bird sightings of interest include a Little Blue Heron, Caspian Tern, and Black-legged Kittiwake. Willets again nested on the island and successfully fledged 3 chicks. The American Oystercatcher's (AMOY) were successful for the first time in 11 years on nearby Green Island. We confirmed two AMOY fledglings. Birdwatching tours visited the island again this year on 125 different occasions. We also documented, and reported, disturbance by four low flying aircraft this summer.

MACHIAS SEAL ISLAND

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Terns

Like 2006, 2007 yielded no tern productivity. In 2006, the tern census on 12-13 June revealed a corrected nest count of 1117 nests; the tern colony abandoned on 25 June, only 12 chicks hatched and none survived.

In 2007 the terns made almost no attempt to nest on MSI. They were observed circling the island for the first time on 13 May, and landed for the first time on 15 May. Over the next month, they landed on the island from early morning until early afternoon. The first tern egg was found on 31 May. A total of 5 nests were found in the monitored productivity plots over the following few weeks (clutch size 1) but no incubation was observed. At no point did the terns spend a single 24 hour period at MSI. On 6 June we found that 2 out of 5 nests had been depredated, presumably by gulls. 6 June was also the last day that terns were seen landing. They were observed circling over MSI until mid to late June in groups of up to 150 individuals. By late July, these groups were seldom larger than 10 terns.

Prior to the tern arrival, gulls were present in small numbers. The CWS sent a hunter to MSI for 10 days, who shot a total of 5 gulls. He left on 15 May, the day of the first tern landing, and from then on we saw a large increase in the numbers of gulls on and around MSI. By mid June they were very abundant on both the north and south ends of MSI, as well as on nearby Gull Rock. We saw mostly Herring Gulls and smaller numbers of Great Black-backed Gulls. During 2 trips to Gull Rock, a total of 22 nests (Herring and Great Black-backed) were found, the largest number of eggs found there since 1995. Four gull nests were found on MSI. The eggs were collected from all nests found on Gull Rock and MSI. The CWS Observer deterred gulls from MSI regularly by using scare pistol and a slingshot. Laughing Gulls were only rarely seen flying around MSI throughout the summer.

Atlantic Puffins

The peak puffin lay this year was 16 May and the peak hatch was 25 June; both dates are 5 days later than in 2006. Hatching success was 0.66 (Table 1). Puffin diet consisted largely (61.2%) of larval fish. This is the highest percentage of larval fish fed to Atlantic Puffin chicks observed on MSI. Herring-type fish (herring, hake or rockling) (26.8%) were also recorded in the diet. See Table 2 for details on Puffin chick diet.

A survey of Atlantic Puffin burrows was done on MSI on 27 and 30 June, and on 1 and 3 July; slight changes in distribution of habitat, due to the storm which scoured the island in April, were recorded.

Razorbills

Razorbill peak lay was 24 May and peak hatch 28 June; both dates are 8 days later than in 2006. Hatching success (0.68) was the third lowest on record. Fledging success (0.35) is the lowest on record.

Razorbill feedings consisted primarily of larval fish of unknown species (66.2%). This is more than twice the proportion of larval fish ever previously observed during Razorbill chick provisioning. Herring-type fish (26.2%) were also present. See Table 3 for details on Razorbill chick diet. The % prey identified as herring in Razorbill diet (12.3%) is the lowest recorded since 1995 (previous lowest was 15.2% in 2001, when sand lance dominated the diet).

Common Murre

2007 was the fifth consecutive year of successful Common Murre nesting on MSI. The high count of murres was only 80 birds compared to the 600 counted in 2004. All eggs found were in sheltered caves. Unlike previous years, the murres made no attempt to lay in open exposed areas. Casual observation indicated a diet composed of herring and butterfish. Twenty-one adult murres were banded.

Common Eiders

On 2 July 2007 we counted the Common Eider nests on MSI. There were 57 nests, 47 of which were occupied on 2 July. The highest number of recorded Common Eider nests was 139 in 2004. The mean clutch size in 2007 was 3.68 (±1.25). The first eggs were found on 27 May and the first ducklings were seen on 29 June in the water.

Peregrine Falcons

Two peregrine falcons were seen in early May circling over MSI, causing skittish behaviour of all the alcids for several days. Throughout the rest of the summer, one peregrine falcon was seen occasionally on MSI and Gull Rock.

Other island notes

The Coastguard wind turbine remained up and running throughout the summer. No bird mortality was observed from its presence.

Travis Clarke completed his second and last field season for his MSc on the seasonal movement of Razorbills. Two of the birds fitted with satellite transmitters in 2006, which were assumed to have died, were seen this year. He recovered one geolocator tag that had been deployed in 2006, and he deployed 15 new radio transmitters on Razorbills; he will also put transmitters on Razorbills in Labrador, and CWS has put some on birds in the Gulf of St. Lawrence, to check winter range.

For a more in-depth analysis and summary of the seabird research on MSI, please consult the latest Machias Seal Island Progress Report, available online at www.unb.ca/acwern.

Table 1. A summary of the breeding success of Atlantic Puffins and Razorbills nesting on Machias Seal Island between 2003 and 2007. N indicates the number of nests where eggs were found.

	Year	N	Hatching Success	Fledglings/nest
Atlantic Puffin	2003	70	0.97	0.77
	2004	56	0.96	0.78
	2005	49	0.92	0.82
	2006	72	0.56	0.35
	2007	**91**	**0.66**	**Forthcoming**
Razorbill	2003	55	0.75	0.60
	2004	58	0.87	0.68
	2005	42	0.74	0.67
	2006	40	0.61	0.56
	2007	**49**	**0.68**	**0.35**

Table 2: Percentages of prey items fed to Atlantic Puffin chicks from 2003 to 2007. N indicates the number of prey items identified.

Year	N	Herring	Hake	Hake or Herring	Euphausiid	Sandlance	Larval Fish	Other
2003	1026	33.2	41.3	0.0	13.3	10.4	0.0	0.7
2004	1316	20.0	5.0	8.7	20.4	0.6	42.6	3.6
2005	2417	1.4	21.6	4.8	44.2	0.1	29.0	2.9
2006	2438	13.9	16.6	7.8	62.3	0.3	4.1	1.4
2007	**2181**	**6.4**	**3.4**	**17.0**	**0.57**	**3.7**	**61.2**	**7.7**

Table 3: Percentages of prey items fed to Razorbill chicks from 2003 to 2007. N indicates the number of prey items identified.

Year	N	Herring	Hake	Hake or Herring	Euphausiid	Sandlance	Larval Fish	Other
2003	463	46.9	40.4	0.0	0.0	6.9	0.0	4.3
2004	1397	66.8	2.2	1.0	0.0	2.1	25.4	1.3
2005	449	36.1	36.7	3.7	2.7	2.0	20.0	2.0
2006	590	70.9	17.0	1.4	0.3	7.8	2.6	1.4
2007	**652**	**12.3**	**6.2**	**7.7**	**0.3**	**5.6**	**66.2**	**1.7**

Maine State Synopsis of Nesting Least Terns

A minimum of 150 least tern pairs nested within the State of Maine. A minimum of 37 of those least tern pairs nested on mainland beaches in Maine. A total of 4 sites were used for nesting, including Stratton Island. All colony sites were simultaneously surveyed on June 27th, during the least tern window count. This count recorded 150 pair on nests, however it is likely an undercount as a few pairs may have not nested at the time. A total of 150 pairs produced approximately 112 fledglings, with the bulk of those (108) produced on Stratton Island.

Number of Nesting Least Tern Pairs and Fledglings ( ) at each Nesting Site in Maine, 1977-2007

	WELLS	LAUDHOLM FARM	CRESCENT SURF	GOOSE ROCKS	GOOSEFARE BROOK	PINE POINT	FERRY/ WESTERN BEACH	STRATTON ISLAND	HIGGINS	RAM ISLAND	SEAWALL	POPHAM	REID STATE PARK	TOTAL
2003	0	20(0)	57(8)	8(0)	0	0	0	-	38 (53)	0	0	0	33(5)	156 (66)
2004	15 (10)	1(0)	[50 (3)]	0	0	0	0	-	45 (54)	0	0	0	50(2)	146 (69)
2005	0	4(1)	[52 (7)]	0	0	0	[40 (3)]	18(9)	[22 (0)]	0	[17 (0)]	0	0	114 (20)
2006	[1(0)]	0	30 (10)	[25 (1)]	0	0	0	103 (15)[4]		0	0	0	[1(0)]	134 (26)[5]
2007	**1(1)**	**0**	**[37 (1)]**	**[45 (2)]**	**0**	**0**	**0**	**113 (108)**	**0**	**0**	**0**	**0**	**0**	150 (112)^6

[ ] colony deserted

[4] preliminary numbers

[5] total was simultaneous count at Stratton, Higgins and Crescent Surf, when majority of birds appeared to be nesting after other sites abandoned

[6] total was simultaneous count at Stratton, Goose Rocks, Crescent Surf, and Wells, when majority of birds appeared to be nesting

Wells Beach, Wells, Maine

Joy Felio, Maine Audubon

Population Estimate:

A single pair of least terns nested at Wells Beach in 2007. Symbolic fencing was not placed in advance around the former nesting site per instructions from private landowners. However, once the nest was established, a small area was symbolically fenced with stake and twine. The site was visited throughout the season, monitors sometimes noting three adult terns in the area.

Productivity: Least terns were first noted incubating a three egg nest on 6/13. On 7/13 two least tern chicks were reported. A single fledgling was produced at Wells Beach. The dune area in the northern section of Wells beach was severely cut by flood storm tides in the spring, leaving 3 to 5 foot steep banks on part of the beach.

Comparison: There were zero nesting pairs of least terns in 2006. In 2005, although there were about ten pairs of least terns scraping, no nests were located, and 15 nesting pairs produced 10 fledglings in 2004.

Predator Control: None.

Laudholm Beach, Wells, Maine

Kate O'Brien, Rachel Carson NWR

Population Estimate:

Zero nesting pairs. Least Terns from Crescent Surf Beach were seen loafing and feeding in the area throughout the season. The beach was highly eroded this year by winter storms. A Nor'easter in April eroded the dune habitat further, leaving steep banks and uncovering rocks along the length of the beach. The storm also uncovered an ancient peat bed at the mouth of the Little River where gulls were often seen loafing.

Comparison: In 2006, symbolic fencing was placed on a portion of the beach, but no nesting occurred. In 2005, four nests were reported, one nest hatched to produce a single fledgling. In 2004 only one least tern nest was documented and zero fledglings reported. In 2003, there were twenty nests and zero fledglings produced.

Predator Control: None.

Crescent Surf Beach, Kennebunk, Maine

Kate O'Brien, Rachel Carson NWR

Population Estimate:

Productivity: Our high count of nests was 37, on July 12th; however 10 days later, at peak hatch, a mink decimated the colony, leaving behind only a few chicks.

Date	# of 1 egg nests	# of 2 egg nests	# of 3 egg nests	Total	Survey Type	# of Chicks	# of Adults	Comments
5/30					Flock	0	50	
6/5	2	0	0	2	General	0	25	At least 8 predated eggs, as well as flooded and missing eggs

6/13	1	1	0	2	Nest	0		
6/27	11	23	0	34	Nest	0	70	
7/12	5	32	0	37	Nest	3	75	Mink tracks inside electric net fence
7/23	n/a	n/a	n/a	4-5	General	2	35	Mink tracks throughout colony, a couple of new nests
7/31	2	0	0	2	Dusk	1*		*1 fledged tern

A dusk survey was completed on July 31st and a single fledgling was recorded.

Comparison: In 2006, 30 pair produced 10 fledglings. In 2005, 52 pair produced only 7 fledglings. In 2004 50 pair produced 3 fledglings. In 2003, 57 pair produced 8 fledglings after colony abandoned due to predation. The last five years show a drastic decline from 2002, when a total of 145 fledglings were produced from 81 pair.

Predator Control: We used a solar powered electric net fence at Crescent Surf Beach with limited success. The fence itself functioned properly throughout the season. However, mink could walk through the net easily, and at peak hatch consumed all of the chicks over a few days. Evidence of fox predation was also found outside of the net fence. Early in the season, crow predated tern nests, but after removing crows and hanging crow effigies in the area, crow predation ceased, although crow tracks were occasionally seen on the beach.

This season, USFWS contracted with USDA Wildlife Services to control key predators in the area. Although we were not able to capture the mink or fox this year, USDA removed gulls, 1 raccoon, and 10 crows. . A crow trap was used also at Crescent Surf Beach, but was unsuccessful.

Western:

Lucy LaCasse, Prouts Neck Country Club

Population Estimate:

Similar to other least tern nesting sites, Western Beach has available nesting habitat and a history of predation. There were no nesting pairs in 2007.

Comparison: In 2006, although a few pairs were exhibiting nesting behavior, no nests were located. In 2005 there were a total of 40 active nests. Crow predated chicks and eggs and reduced productivity. However, a total of 3 fledglings were produced. Prior to 2005 least terns had not nested here since 1981.

Other notes: Before the 2005 nesting season, Western Beach was part of a beach nourishment project where 267,000 square feet of new habitat was created.

Predator Control: This season, USFWS contracted with USDA Wildlife Services to control key predators at this site. Four crows and seven raccoons were trapped and removed from the site.

Stratton Island:

National Audubon

Population Estimate:

An estimated 113 pairs of least terns produced approximately108 fledglings, for a productivity of 0.96 fledglings per pair. It appeared that nest predation events on mainland beaches caused an influx of nesting least tern pairs at Stratton Island throughout the season.. Of all the least tern nesting sites in Maine, Stratton Island had the only real nesting success this year.

Comparison: In 2006, 103 pairs produced 15 fledglings. 2005 was the first year least terns had nested on Stratton Island; with 18 pairs producing 9 fledglings.

Higgins Beach:

Joy Felio, Maine Audubon

Population Estimate:

The sandspit at Higgins Beach where substantial colonies have nested in the past, has changed in orientation and become vegetated, decreasing the available nesting habitat for least terns. A large mammalian exclosure was erected in early May, as in years past, but was damaged by heavy surf later that month. A portion of the metal exclosure fencing was left intact, though an approximately 100 foot long section was removed and replaced with stake and twine symbolic fencing. Least tern decoys were deployed when the exclosure was first erected, then later removed and used at Crescent Surf Beach after the exclosure was damaged. Least terns were seen courting and scraping later in the season; no nests established.

Comparison: In 2006, a single nest was abandoned by June 27th. In 2005 the entire colony abandoned due to crow predation, no eggs were hatched. In 2004 there were 54 fledglings from 45 pairs, and in 2003 there were 53 fledglings from 38 pairs.

Predator Control: This season, USFWS contracted with USDA Wildlife Services to control key predators at this site. One crow, two opossum, and six raccoons were trapped and removed from the site.

Seawall:

Joy Felio, Maine Audubon

Population Estimate:

There appeared to be a large amount of suitable nesting habitat near the Sprague River this season. Perhaps because this beach has had a history of predation, no least terns established nests in 2007.

Comparison: In 2006, no nesting pairs used Seawall. In 2005, an early colony was established with 17 nests, but later was decimated from fox or coyote predation. From 2002-2004 there were no least tern nests recorded.

Predator Control: None.

Reid State Park:

Joy Felio, Maine Audubon

Population estimate:

There were no nesting least terns at this site in 2007. A pair was observed for three weeks in June loafing on Half Mile Beach and in August common and least tern adults and fledglings were observed fishing and loafing in the salt marsh behind Half Mile Beach.

Comparison: A single nesting pair in 2006, but no fledglings. In 2005, there were no nesting pairs. In 2002 to 2004, however, 19 to 50 nesting pairs produced very few fledglings due to predation.

Predator Control: None.

A complete provincial survey was conducted in 2007. These are the numbers for the Gulf of Maine.

TERN CENSUS AND SEASON SUMMARY – 2007 GOMSWG
SUBMITTED by: Canadian Wildlife Service

Census Date	Island Name	COTE #	ARTE #	ROST #	Island Census Method *	Productivity ** FL/Nest	N	SD	Method	Clutch Size + x Size	N	SD
June 16	The Brothers (GOM)	365		69	N							
	Ille ferre	44			N							
	Potato Island	1			NP							
	Rocco Point	1			NP							
	Holmes	1			NP							
	Bar Island	1			NP							
	Tusket River	1			NP							
	Spectacle Islands	8			NP							
	Peases Island	4			NP							
	Pinch Gut	5			NP							
	Piccote	5			NP							

	Frost	5			NP							
	Inner Tusket Island	8			NP							
	Weymouth Harbor	9			NP							
	Ellenwood	9			NP							
	Ille Chesapeake	19			NP							
	Half Bald Tusket	23			NP							
	Bonds Island											
	Green Island	31			NP							
	Green Island	39			NP							
	The Cape, Cape Sable Island	58			NP							

For species counts where the Lincoln Index has been applied, please list the original count followed by the adjusted count (e.g. 100/113)

***** CENSUS METHOD: Please use letter codes as listed:

N = Nest count

NP = Nesting Pairs (from visual estimates)

VE = Visual estimates from the island (# of individual birds)

VEB = Visual estimates from a boat (# of individual birds)

****** PRODUCTIVITY:

FL/Nest = Average number of fledglings per nest should be expressed as follows: e.g. (0.6) = 0.6 fledglings per nest. List high counts of fledglings in brackets when detailed productivity estimates are not available. Use "-" to indicate insufficient data. **NOTE:** 15-day-old COTE and ARTE chicks are considered fledglings for GOMSWG productivity estimates. ROST chicks are considered fledged at 5 days.

N = Number of nests used to determine island productivity (sample size).

SD = Standard deviation

Method (list all numbers that apply): 1 = Feeding study; 2 = Fenced Plot; 3 = Unfenced Plot

+ CLUTCH SIZE (include if available):

Clutch size is pooled from feeding and productivity numbers.

N = Sample size

x = Mean clutch size

SD = Standard deviation

GULL CONTROL DATA

Island Name	Gulls Killed		Nests Destroyed	
	HERG	GBBG	HERG	GBBG
Country Island	**0**	**0**	**0**	4-6
Brothers Island	0	0	0	0

PART 2: RESEARCH PRESENTATIONS

South Coast Offshore Wind Project 2007 Avian Studies, Buzzards Bay MA

Patriot Renewables, LLC is currently studying the feasibility of an off shore wind project in Buzzards Bay. The appropriate siting of South Coast Offshore Wind Project demands that in-depth field research be conducted to analyze information on area seabirds and marine life so that potential impacts of the project on area wildlife, especially those species that are considered endangered and/or threatened, can be more accurately accessed. Surveys are conducted by boat on five transects of varying length, recording species, direction, elevation, and behavior of all bird species encountered within 300ft of the boat traveling at 11kts. Some preliminary data will be presented regarding observations thus far for the spring and summer seasons.

2007 Seabird Tick Submissions

Data Summary

Primary source of 2007 submissions, as of August 9, 2007, have been Matinicus Rock, and Machias Seal Island.

Matinincus Rock: Audubon staff collected a total 33 *Ixodes uriae* nymphs from ATPU's and/or researchers after grubbing. An additional 3 female *I. uriae* were found on an ATPU and a RAZO in June and early July. To date, none of these ticks have tested positive for Lyme spirochetes by PCR or direct fluorescent antibody test (DFA).

A brief tick survey conducted on July 27, 2007 on MR produced ~270 *I. uriae* nymphs. Two ATPU chicks and one RAZO chick was examined but no ticks were found. Ticks were collected in the vicinity of the boathouse by flagging burrows and vegetation, where soils might be more humid. To date, 80 of the 270 ticks collected have been tested and recorded. All have been negative for Lyme spirochetes. It is interesting to note that ticks found this year were very focal, in the area of the boathouse. It would be interesting to note if this is the case in future years or if the ticks on the island are more evenly distributed.

Machias Seal Island: Four female *I. uriae* were submitted from MSI early in the season, retrieved from ATPU's. None of the four tested positive for Lyme spirochetes. A flagging expedition to the island is planned for August 2007, with the hopes of collecting more ticks for testing.

Notes/comments

After summarizing the data submitted from 1996 to the present, it becomes apparent that the ticks are not evident every year on Maine islands. While we have anecdotally heard that researchers don't see ticks in some years on handled birds, it is clear that there are years in which seabird ticks are more abundant (Fig. 1). While we don't yet know if some of the low years reflect low sampling size of birds examined, abiotic factors influencing

seabird populations (weather, climate, etc), or a natural cycle at work, it is clear we have much to learn about the ecology of this tick on Maine islands.
It is also unclear whether the pocket of infected ticks found in maritime Canada will continue to maintain the European strain of Lyme disease found at Gull and Gannett Islands. This will, hopefully, become apparent as work the work goes on.

We hope to do some more work on these islands in the future, and want to thank all those who have helped us with this project so far.

-Staff of the MMCRI Vector-borne Disease Lab

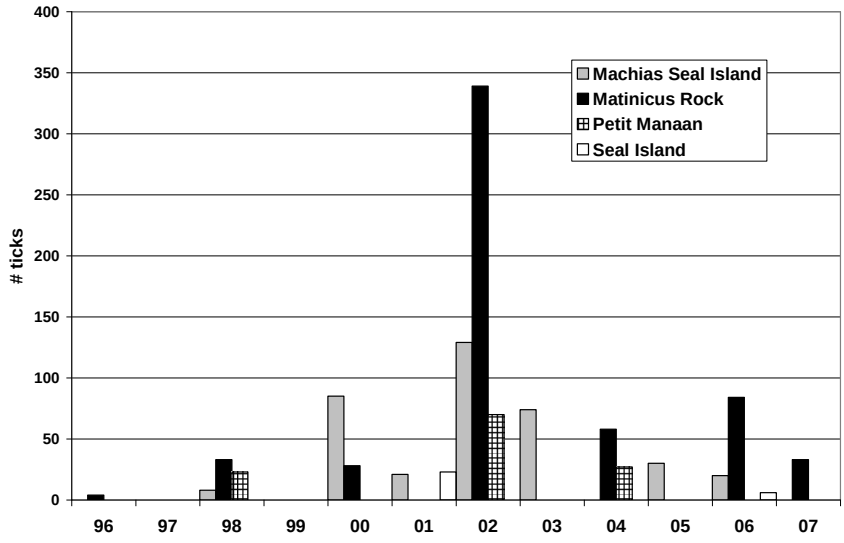

Figure 1. Numbers of *Ixodes uriae* nymphs submitted from Maine islands, 1996-2007.

Mid-Atlantic/New England/Maritimes (MANEM) Regional Waterbird Conservation Plan Update

Stephanie Schmidt, Manomet Center for Conservation Sciences, schmidt@manomet.org.

The Mid-Atlantic/New England/Maritimes (MANEM) Regional Waterbird Conservation Plan was developed to address conservation issues pertaining to regional waterbird populations and habitats from Newfoundland and Prince Edward Island down to Virginia (Bird Conservation Regions 14 (Atlantic Northern Forest) and 30 (New England/Mid-Atlantic Coast), and in Large Marine Ecosystems 7 (Northeast US Continental Shelf) and 8 (Scotian Shelf)). The 2007 Plan is the first conservation plan for waterbirds to be published for the MANEM region and was drafted to step down the goals of the continental North American Waterbird Conservation Plan (NAWCP) to smaller scales in order to identify priority species, habitat and species goals, and prioritize implementation

projects. The MANEM Plan has only been possible through the collective efforts of regional wildlife managers, scientists, conservationists and supporters.

The foundation for the MANEM's Plan is the North American Waterbird Conservation Plan developed by the Waterbird Conservation for the Americas initiative. Through guidance and support of coordinated conservation efforts, the NAWCP strives to sustain or restore waterbird abundance, diversity, distribution, and associated habitats in Canada, the U.S., Mexico, the Caribbean, Central America, and the open waters of the Pacific and Atlantic.

The following is an update of MANEM for 2007. The draft Plan can be found at http://www.fws.gov/birds/waterbirds/MANEM/ :

- Final draft MANEM plan was released last fall for a several month review period
- Approximately 20 people commented on the plan
- All comments were helpful and almost all dealt with minor factual corrections (e.g. seabird presence on the Scotian Shelf for three months or two months)
- Plan is to have all comments incorporated by end of year, but for all intents and purposes, the plan is largely finished
- Over the past year, the subregional working groups have continued to meet (GOMSWG, SNELIWG, Harbor Herons, mid-Atlantic) and pursue their conservation agendas
- Also, an Atlantic At-Sea Bird Coalition has formed and developed an action plan
- A marshbird monitoring working group has formed, developed a regional focal species list, agreed on site protocols, made headway on sampling design for region, and agreed to database management plan
- Other waterbird monitoring working groups are also at work although less far along
- The MANEM steering committee is expected to transform into an implementation committee this fall, with representative members identifying opportunities for plan implementation and working with partners to secure funds and other resources

Progress report of contaminant screening in Maine Birds for the 2007 Field Season

Principle Investigator: Wing Goodale, BioDiversity Research Institute (BRI)

Introduction

Starting in May 2007, BioDiversity Research Institute (BRI) initiated a broad based contaminant study on Maine birds, measuring both historical and emerging chemicals. This comprehensive project is measuring 192 synthetic contaminants in 23 species across Maine to determine in which species, habitats, and locations these anthropogenic compounds are concentrating. The chemicals we are analyzing in 60 egg composites are polychlorinated biphenyl (PCB) congeners, organochlorine pesticides (DDTs, HCHs, chlordanes, HCB), polybrominated diphenyl ether (PBDE) congeners, perfluorinated compounds (PFCs; e.g., PFOS, PFOSA, PFHxS, PFOA, PFNA, PFDA, PFDoDA, PFUnDA, PFHxA, PFHpA) and mercury. Dr. Kannan at the Wadsworth Center in New York is currently analyzing these eggs. We will receive the results in December 2007 and hope to release a preliminary report by February 2008.

The project has two components. The first is evaluating geographic differences by analyzing eggs of seven marine species from six sites near the outflows of Maine's three largest rivers (Table 1). We are evaluating terrestrial and fresh water geographic variation with common loon and bald eagle eggs (Table 1). The species we have selected have a broad range of foraging strategies and represent both permanent residents (local contamination) and migrants (regional and global contamination).

The second component is evaluating exposure in major habitat types through analyzing eggs from multiple species in the same area. In the Portland, Maine area we collected eggs from marine, estuarine, riverine, lake, and terrestrial habitats, focusing on high trophic level predators (Table 1). These predators are insectivores, piscivores, and bird and mammal eaters. Additionally, to ensure direct comparison between habitats, we collected eggs from tree swallows. Collectively, this sampling effort will provide a vital baseline and initial screening of contaminant levels, and help determine if contaminants are concentrating in certain areas.

Compounds being analyzed.

- 154 isomers of PCBs with 35 coleuting pairs (IUPAC number in the order of GC-MS elution: 4+10, 9+7, 6, 5+8, 19,18,17,15,24+27,16+32,26,25,28+31,20+33+53,22, 36, 37, 54, 50,53,51,45, 52+73, 46+69, 49+43, 47+48+75, 44, 59+42, 41+64, 40+57, 67, 63, 74+61, 70+76, 66+80, 60+56, 77, 104, 98+102, 93+95, 91, 92, 84, 90+101+89, 99, 86+97, 97+113, 87+117+125+116+111+115, 85+120, 110, 82, 124, 107, 118+106, 114+122, 105+127, 126, 155, 136, 151, 135+144, 149+139, 134, 133, 146+161, 153, 132+168, 141, 137, 130, 138+164+163, 158, 129, 128, 167, 156, 157, 169, 188, 179, 176, 178, 187+182, 183, 185, 174, 177, 171, 173, 172+192, 180, 193, 191, 170, 190, 189, 202, 201, 197, 200, 198, 199, 196+203, 195, 194, 205, 208, 207, 206, and 209), including mono-ortho PCB congeners (105, 118, 189).

- 12 PBDE congeners (IUPAC numbers BDE-28, 47, 66, 85, 99, 100, 138, 153, 154, 183, 203, and 209).

- 12 perfluorochemicals (PFCs): Perfluorooctanesulfonate (PFOS), perfluorohexanesulfonate (PFHxS), perfluorobutanesulfonate (PFBS), perfluorooctanesulfonamide (PFOSA), perfluorododecanoate (PFDoDA), perfluoroundecanoate (PFUnDA), perfluorodecanoate (PFDA), perfluorononanoate (PFNA), perfluorooctanoate (PFOA), perfluoroheptanoate (PFHpA), perfluorohexanoate (PFHxA), and perfluoropentanoate (PFPeA).

- 13 OC pesticides (DDTs: p,p'-DDE, p,p'-DDD, o,p-DDT, p,p'-DDT; CHLs (chlordanes); trans-nonachlor, cis-chlordane, oxychlordane, cis-nonachlor, trans-chlordane; HCHs: α-, β- and γ- isomers; and HCB- hexachlorobenzene)). In addition samples will be screened for Aldrin and dieldrin.

- Total mercury

Table 1. Species and location of samples collected.

Code	Species	State	Town	Location	Habitat
AMKE	American Kestrel	ME	Gorham	Gorham	Terrestrial
ARTE	Arctic Tern	ME	Millbridge	Petit Manan Island	Marine
ATPU	Atlantic Puffin	ME	Millbridge	Petit Manan Island	Marine
BAEA	Bald Eagle	ME	TBA	TBA	Riverine
		ME	Boothbay	Tibbet Island	Marine
		ME	TBA	TBA	Riverine
		ME	TBA	TBA	Fresh water aquatic
		ME	TBA	TBA	Fresh water aquatic
BEKI	Belted Kingfisher	ME	Falmouth	Presumscott River	Riverine
		ME	Westbrook	Presumscott River	Riverine
BLGU	Black Guillemot	ME	Millbridge	Petit Manan Island	Marine
		ME	Criehaven TWP	Seal Island NWR	Marine
		ME	Deer Isle	Western Island	Marine
COEI	Common Eider	NH	Kittery	Appledore Island, Isle of Shoals	Marine
		ME	Phippsburg	S. Sugarloaf Island	Marine
		ME	Islesboro	Flat Island	Marine
		ME	Old Orchard Beach	Stratton Island	Marine
		ME	Eastport	Goose Island	Marine
		ME	Criehaven TWP	Seal Island NWR	Marine
COLO	Common Loon	ME	Dead River TWP	Flagstaff, Beaver	Fresh water aquatic
		ME	Lincolnville	Coleman Pond	Fresh water aquatic
		ME	Bridgton	Forest Ingalls Pond	Fresh water aquatic
		ME	Lincoln TWP	Aziscohos, Dam	Fresh water aquatic
		ME	Mount Desert Island	Long Lake	Fresh water aquatic
COTE	Common Tern	ME	Millbridge	Petit Manan	Marine
DCCO	Double-crested Cormorant	ME	Phippsburg	S. Sugarloaf Island	Marine
		ME	Islesboro	Flat Island	Marine
		ME	Old Orchard Beach	Stratton Island	Marine
		ME	Eastport	Goose Island	Marine
		NH	Kittery	Lunging Island, Isle of Shoals	Marine

GBBG	Great Black-backed Gull	ME	Old Orchard Beach	Stratton Island	Marine
		ME	Phippsburg	S. Sugarloaf Island	Marine
GLIB	Glossy Ibis	ME	Old Orchard Beach	Stratton Island	Estuarine
HERG	Herring Gull	ME	Kittery	Appledore Island, Isle of Shoals	Marine
		ME	Islesboro	Flat Island	Marine
		ME	Phippsburg	S. Sugarloaf Island	Marine
		ME	Old Orchard Beach	Stratton Island	Marine
		ME	Eastport	Goose Island	Marine
		ME	Criehaven TWP	Seal Island NWR	Marine
LETE	Least Tern	ME	Kennebunk	Crescent Surf	Marine
LHSP	Leach's Storm-petrel	ME	Criehaven TWP	Seal Island NWR	Marine
OSPR	Osprey	ME	South Portland	Bug Light	Marine
		ME	Portland	Fore River	Marine
		ME	Phippsburg	S. Sugarloaf Island	Marine
		ME	Stockton Springs	Fort Point	Marine
		ME	Bucksport	Verso Mill	Marine
		ME	North Haven	Hog Island	Marine
PERG	Peregrine Falcon	ME	Portland	Casco Bay Bridge	Terrestrial
PIPL	Piping Plover	ME	Wells	Wells Beach	Marine
		ME	Phippsburg	Popham Beach	Marine
		ME	Saco	Ferry Beach	Marine
		ME	Biddeford	Hills Beach	Marine
RWBL	Red-winged Blackbird	ME	Falmouth	Highland Lake	Fresh water aquatic
SNEG	Snowy Egret	ME	Old Orchard Beach	Stratton Island	Estuarine
TRSW	Tree Swallow	ME	Scarborough	Scarborough marsh	Estuarine
		ME	Falmouth	Highland Lake	Fresh water aquatic
		ME	Falmouth	Gilsland Farm	Mixed
		ME	Old Orchard Beach	Stratton Island	Marine
VIRA	Virginia Rail	ME	Scarborough	Scarborough marsh	Estuarine
WILL	Willet	ME	Scarborough	Scarborough marsh	Estuarine

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