

Gulf of Maine Seabird Working Group  
20<sup>th</sup> Annual Meeting  
August 14, 2003  
Hog Island, Bremen, Maine

Compiled by Petit Manan National Wildlife Refuge

**Introduction:**

Arctic, common, and roseate terns have all experienced significant population growth over the past 20 years due to the combined efforts of the members of the Gulf of Maine Seabird Working Group (GOMSWG). The Gulf of Maine now supports 21,397 pairs of common terns, 5,287 pairs of Arctic terns, and 381 pairs of roseate terns. In addition, 1,244 pairs of least terns nest along the beaches of Maine and Massachusetts. Laughing gull numbers continue to increase rapidly, and the population has grown to 4,389 pairs (a 75% increase in 5 years). Atlantic puffin and razorbill numbers also continue to increase and the Gulf of Maine (GOM) now supports over 4,000 pairs of puffins and close to 900 pairs of razorbills. Biologists on Machias Seal Island confirmed the first breeding of common murre in the GOM in over 100 years when they documented at least 45 active burrows.

Despite the tremendous success of the seabird restoration projects, we still have some challenges ahead of us. Many agencies have identified the need to increase the number of colonies supporting nesting terns and alcids, and to increase the geographic distribution of the colonies along the coast. For example, within the GOM common terns nest on 49 islands however 84% of the population nests on eight islands. A similar situation exists for Arctic terns, with 92% of the GOM Arctic terns nesting on four islands. The distribution of roseate terns is even more drastic, with 66% of the GOM birds nesting on two islands.

**Part 1 – Island Summaries**

**Machias Seal Island**, *Mathieu Charette, ACWERN, University of New Brunswick*

Tern Census

The tern census this year was conducted by the ACWERN chair, Tony Diamond, the ACWERN research crew (Kate Devlin, Amie Black), Julie Paquet from the Canadian Wildlife Service (CWS), the CWS island observer (Chris Novak) and two lighthouse keepers (Paul Cranford and Russel Ross). This census was conducted from the 18-21<sup>st</sup> of June for Mathieu Charette Master's Project in an off-year of the CWS biannual island wide tern nest count. The Lincoln Index was 1.086758, with a species ratio of 60% Arctic and 40% Common. The uncorrected total was 2768, total corrected number calculated are 3323 nests (includes 290 nests which are an average count of a section of

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the colony not censused in 2003). This gives us a total of 1329 Common Tern nests and 1994 Arctic Tern nests. The 2003 census has a similar total count to the 2002 census (3323 nests), and Common terns (1349 nests), but less Arctic Terns than the 2002 census (2202), see Table 1.

#### Arctic Tern

Peak laying was on the 10<sup>th</sup> of June, and peak hatch was on June 27<sup>th</sup>. Productivity was .70, compared to .57 in 2002. See Table 3. The dominant food item for Arctic Terns was euphausiid shrimp followed by hake. See Table 2. A total of 23 Arctic Tern nests were followed for a total of 287 nest hours of observation with a feeding rate of 1.87 feedings per hour.

#### Common Tern

Peak laying was on the of May was on the 14<sup>th</sup> of June, and peak hatch was on June 29<sup>th</sup>. Productivity was .76 compared to .64 in 2002. See Table. 3. Common Terns brought in a higher proportion of Herring, followed by euphausiid shrimp. See Table 2. A total of 34 Common Tern nests were observed for a total of 300 nest hours with a feeding rate of 1.31 feedings per hour.

#### Atlantic Puffin

Peak laying for Atlantic Puffins was on the 13<sup>th</sup> of May, 3 days earlier than last year. The first Puffin fledging was collected on the 25<sup>th</sup> of July, 6 days later than last year. Most of the Puffin chicks this year were between 300-340g. Chicks fledged later and were larger than last year. Diet was predominantly hake 41.7%, followed by herring 33.4%, euphausiid shrimp 13.2%, sandlance 10.5% and 1.2% other. This contrasts with a diet of 57.8% shrimp in 2002. The diet was predominantly hake at the beginning of the season and switched to herring about half way during chick rearing. A burrow survey in May suggested that the Puffin population of MSI seems to be expanding.

#### Razorbills

Peak laying for Razorbills was on the 21<sup>st</sup> of May, the first chick was seen on the 15<sup>th</sup> of June, and peak hatch was on the 25<sup>th</sup> of June. Hake increased compared to last year (from 13.4% to 40.6%). Similar to the other species there was a switch from Hake to Herring about half way during chick rearing period. The diet was composed of 47.1% herring, 40.6% hake, 7.1% sandlance and 5.1% other. Similar to the Puffin population, the Razorbill population seems to be increasing on the island.

#### Predator Activity

There were an increasing number of Great Black- Backed Gulls and Herring Gulls loafing on the island this season; due to many days in the fog it has been difficult to detect an increase in predation. A total of 65 pyrotechnics were used to deter loafing and nesting this year, compared to 19 last year. No gull nests were destroyed or gulls shot this season. Up to three Peregrine Falcons visited the island everyday from the 6<sup>th</sup> of June until the 7<sup>th</sup> of July predated on adult terns.

**Comment [TD2]:** Do we have any evidence for this? We didn't do a survey, nor did we do tower counts. Leave out unless there are data to back it up.

**Comment [TD3]:**

**Comment [TD4]:** It is REALLY important to get species names right...

Up to 600 adult Common Murres were observed loafing on the rocks among razorbill burrows this year. The first Murre egg was found on the 15<sup>th</sup> of June and the first chick hatched on the 13<sup>th</sup> of July. A total of 45 eggs were found but we kept our presence in this part of the colony to a minimum, thus we are unsure how many eggs were laid and their fate. Two Black Tern nests were found on the island with 2 eggs each, but both nests were unsuccessful. Two Laughing Gull nests, 2 eggs each, were found on the island. A maximum of 7 Laughing Gulls were seen at one time. A Golden-Crowned Sparrow and Western Tanager were seen on the 28<sup>th</sup> of June and 21<sup>st</sup> of July respectively. We tried to attract Roseate Terns on the island in two different areas using sound systems, decoys, and stand-up mirrors. At least one Roseate Tern was seen daily in May but we have no evidence of breeding on the island

**Comment [TD5]:** Upland Sandpiper and LeConte's Sparrow should also be mentioned

**Table 1.** Tern census counts and species ratio for Machias Seal Island 1994, 1996, 1998, 2000, 2002 and 2003 (data from Newell 1994, Newell 1996, Newell and Mackinnon 1998, Boyne et al. 2000, Mackinnon et al. 2002).

Year	Corrected Total	Species Ratio % COTE	% ARTE
1996	2286	27.1 % (617)	72.9 % (1669)
1998	3354	30 % (1006)	70 % (2348)
2000	2662	31 % (825)	69 % (1837)
2002	3551	38 % (1349)	62 % (2202)
2003	3323	40 % (1329)	60 % (1994)

**Table 2.** Tern diet summary percentage of identified prey for Machias Seal Island 2003.

Species	Herring	Hake	Euphausiid	Butterfish	Other
ARTE	9.89	12.13	50.93	1.68	2.63
COTE	28.93	5.83	31.47	3.55	2.27

**Table 3.** A summary of the breeding success of Common and Arctic Terns, Puffins and Razorbills nesting on Machias Seal Island between 1995 and 2003. Mean (SD) clutch size, number of hatchlings and fledgling per nest are listed.

Species	Year	n	Clutch Size	Hatching Success	Chicks/nest Alive at Day 15	Chicks/nest Alive at Day 20	Fledglings/nest*
Common Tern	1999	31	2.26 (0.729)	1.84 (1.003)	1.10 (0.746)	1.03 (0.752)	1.03 (0.752)
	2000	34	1.74 (0.618)	1.24 (0.923)	0.74 (0.618)	0.53 (0.507)	0.53 (0.507)
	2001	74	1.77 (0.562)	0.92 (0.933)	0.65 (0.730)	0.50 (0.603)	0.50 (0.603)
	2002	72	1.85 (0.522)	1.11 (0.881)	0.64 (0.612)	0.54 (0.625)	0.54 (0.625)
	<b>2003</b>	<b>42</b>	<b>1.75 (0.436)</b>	<b>0.97 (0.787)</b>	<b>0.76 (0.741)</b>	<b>0.54 (0.673)</b>	<b>0.50 (0.53)</b>
Arctic Tern	1999	34	1.82 (0.387)	1.27 (0.864)	0.77 (0.699)	0.62 (0.609)	0.56 (0.504)
	2000	87	1.57 (0.520)	0.86 (0.864)	0.41 (0.518)	0.38 (0.488)	0.38 (0.488)
	2001	125	1.53 (0.501)	0.91 (0.803)	0.74 (0.706)	0.63 (0.690)	0.58 (0.637)
	2002	285	1.54 (0.506)	0.91 (0.803)	0.57 (0.599)	0.50 (0.602)	0.50 (0.602)
	<b>2003</b>	<b>62</b>	<b>1.52 (0.537)</b>	<b>0.95 (0.837)</b>	<b>0.70 (0.695)</b>	<b>0.55 (0.663)</b>	<b>0.50 (0.616)</b>
Atlantic Puffin	1999	83	1	0.70 (0.462)	-	-	0.60 (0.494)
	2000	73	1	0.78 (0.417)	-	-	0.48 (0.503)
	2001	78	1	0.81 (0.397)	-	-	0.71 (0.458)
	2002	76	1	0.91 (0.291)	-	-	0.59 (0.495)
	<b>2003</b>	<b>60</b>	<b>1</b>	<b>0.98 (0.120)</b>	-	-	<b>0.80 (0.403)</b>
Razorbill	1999	60	1	0.80 (0.403)	-	-	0.60 (0.493)
	2000	71	1	0.74 (0.444)	-	-	0.62 (0.490)
	2001	62	1	0.82 (0.385)	-	-	0.65 (0.482)
	2002	57	1	0.89 (0.317)	-	-	0.63 (0.490)
	<b>2003</b>	<b>55</b>	<b>1</b>	<b>0.75 (0.440)</b>	-	-	<b>0.60 (.494)</b>

Comment [TD6]: Use no more than TWO D.P.

\* Fledglings/nest - Those tern chicks found dead after day 20 were subtracted from the number of chicks fledged. Not including late nesters at time of calculation for 2003 for ATPU, ARTE and COTE.

## Maine Colonies:

### Petit Manan Island – Liz Rogan, Island Supervisor

#### Census:

We conducted the Gulf of Maine Seabird Working Group (GOMSWG) Census on June 17-18 and documented 1,831 tern nests with a Lincoln Index corrected total of 2,012 nests. This represents 1,213 pairs of Common terns, 799 pairs of Arctic Terns and 31 pairs of Roseate Terns. The species ratio of the colony was 60.3% Common to 39.7% Arctic.

GOMSWG Minutes 2003

Year	Common	Arctic	Roseate	Puffin	Laughing Gull
1999	908	580	28	24	661
2000	962	474	16	17	794
2001	859	622	16	17	961
2002	990	671	27	20	838
2003	1213	799	31	28	1123

Alcids:

Alcid use of Petit Manan Island continues to increase and this season we documented 28 pairs of puffins and over 150 pairs of black guillemot. All six of the artificial nest burrows (flower pots) placed on the island in early May were used by the birds, and three puffin chicks were fledged from the structures. The alcid high counts for the season were: 168 puffins (8/2), 64 razorbills (6/24), 41 common murre (6/21), and 340 black guillemot (5/22). We were also very excited to document the first breeding attempt of razorbills on PMI. We banded 14 puffins and read 56 different puffin bands this summer.

Provisioning and Productivity:

Common and Arctic terns had average reproductive success this season with common terns producing 1.5 chicks/pair, Arctic Terns producing 1.03 chicks/pair, and Roseate Terns at 0.55. The primary prey items delivered to both Arctic and Common Tern chicks were Atlantic Herring (*Clupea harengus*) and Hake (*Urophycis* and *Enchelyopus* spp.). A chicks (first hatch) received 70%, B chicks (second hatch) 24%, and C chicks (third hatch) received 1.5% of all prey deliveries. The average feeds per nest hour for Arctic Terns was 1.08 and 1.74 for Common Terns.

Productivity Measure	Common Tern	Arctic Tern
Sample size	8	22
Mean Clutch Size	2.35	1.72
Mean Hatch Success	100%	95.2%
Mean Fledgling Success- GOMSWG	78.5%	80%
Mean Fledgling Success (chicks surviving to end of season)	64.6%	67.8%
Mean Reproductive Success – GOMSWG	78.5%	75%
Mean Reproductive Success (chicks surviving to end of season)	57.7%	61.1%
# Chicks Fledged/Nest – GOMSWG	1.835	1.21
# Chicks Fledged/Nest (chicks surviving to end of season)	1.5	1.03

\*GOMSWG fledge=chicks surviving to 15 days

Laughing Gulls:

In an effort to reduce competition for nesting habitat and to reduce predation on tern eggs and chicks, we continued efforts to control the nesting distribution of laughing gulls on PMI. We eliminated all laughing gull nesting attempts on the north and east sides of the island. These areas support the greatest density of nesting terns.

Vegetation Management:

Prior to the nesting season, Refuge staff burned a large portion of the island to enhance nesting habitat for the terns (i.e. reduce rank vegetation). Although the island has a rather charred look in May, the vegetation quickly “greens-up” and the terns shifted their nesting distribution into the managed areas. The lower vegetation height also facilitates laughing gull control efforts undertaken later in the year.

Unexplained “illness”:

Tern chicks on Petit Manan exhibited unexplained symptoms of a possible disease, including whitish buildup on bill and tarsus, dirty belly feathers, and some slight lesions on upper mandible. Dr Opitz an avian pathologist from the University of Maine made several visits to the island, necropsied a large number of terns and collected various samples. Although Dr Opitz was able to culture over 10 different fungi from the beaks of tern chicks, none were implicated in the “disease”. It appeared that a number of the chicks recovered from the condition and showed little evidence of any white buildup by seasons end. This did not appear to be the same condition observed on tern colonies in southern Maine.

**Ship and Trumpet Islands, Linda Welch, Petit Manan NWR**

The 2003 breeding season represents the 10<sup>th</sup> year of seabird restoration efforts on Ship Island. The project initially appeared to be a great success and supported over 500 pairs of common terns in 1988 and 1999. Since that time the colony has been plagued by a variety of predators, primarily mink. Despite extensive trapping efforts by Refuge staff and island crew, we have not been successful in trapping the mink. Although terns have established nests on the island (78 nests in 2003), no chicks have fledged from the island in several years.

A complete census of nesting birds was conducted on the adjacent Trumpet Island. We documented 626 common eider, 45 double crested cormorant, 24 herring and 41 great black backed gull nests. At this point in time, the future of the Ship Island tern restoration project remains uncertain. However, it is apparent that several hundred terns continue to try nesting within Blue Hill Bay and they have been subject to gull and mink predation on most of these islands.

**Seal Island National Wildlife Refuge**, *Carlos Zavalaga, Island Supervisor*Census

The ARTE and COTE tern census was conducted on 17-18 June by five persons and completed in 4.66 hours. The unadjusted count was 2130 tern nests. For the estimation of the Lincoln Index a sample of 232 were identified and marked with tongue depressors in a transect chosen at random. The correction factor [(marked + unmarked)/ marked] was 1.047. After applying a Lincoln Index of 1.047 to the unadjusted number of 2130, and after adding 88 nests from the productivity plots and 30 nests from the feeding plots, the adjusted total became 2349 tern nests.

The species ratio was undertaken by observations and counts of 762 incubating terns from five permanent blind locations and four enclosures. From each blind a roughly 30-meter diameter circle was established. This technique provided coverage of both varying geographic (central and peripheral) as well as physical (different microhabitats of exposed ledges, high vegetation, and rock slabs) coverage of the colony. The proportion of ARTE and COTE nests was 0.454 and 0.546, respectively. The total number of ARTE nests in 2003 was similar to that found in 2002. Nevertheless, the number of COTE nests in 2003 decreased by 19% in comparison to the 2002 (Table 1)

Table 1. Total number of tern nests on SINWR 1999 to 2003

<b>Year</b>	<b>ARTE</b>	<b>COTE</b>
1999	1082	955
2000	890	1205
2001	860	1197
2002	1057	1582
2003	1066	1283

No Laughing Gull nests were found on SINWR.

Tern Productivity

Productivity was assessed in 52 ARTE nests and 67 COTE nests distributed in four enclosures and seven feeding plots (3 for ARTE and 2 for COTE). Chicks were marked with a BBL band in the hatching date and with a metal field readable band when they were at least 10 days old. All productivity indicators for ARTE and COTE in 2003 were lower than in 2002 (Table 2 and 3), but the differences were larger in ARTE than in COTE. The lower productivity in 2003 may be associated to a delayed onset of breeding (2003 first hatchling: 19 June; 2002: 16 June) and lower provisioning rates (see below). Main causes of mortality in a sample of 44 dead chicks in the enclosures were: starvation (59%), unknown (30%) and rain (11%). About 50% of the unknown dead chicks disappeared within the enclosures, presumably eaten by gulls.

Table 2. Productivity indexes for ARTE on SINWR in the last five years.

Productivity Index	1999	2000	2001	2002	2003
Mean clutch size	1.83	1.87	1.86	1.84	1.69
Mean hatching success	1.60	1.67	1.64	1.57	1.38
Mean fledging success	0.90	0.95	0.95	1.11	1.00

Table 3. Productivity indexes for COTE on SINWR in the last five years

Productivity Index	1999	2000	2001	2002	2003
Mean clutch size	2.70	2.2	2.06	2.11	1.97
Mean hatching success	2.43	1.94	1.94	1.78	1.69
Mean fledging success	0.96	0.77	1	1.09	1.01

#### ARTE and COTE feeding studies

Between 25 June and 25 July 2003, a total of 13 ARTE and 12 COTE nests were observed in 5 feeding plots (3 for ARTE and 2 for COTE). The prey type and size were determined by direct observations of food brought by the adults to their chicks. The feeding rate was 1.54 and 1.42 prey delivered per hour for ARTE and COTE, respectively. The provisioning rate for ARTE in 2003 was lower than that recorded in 2002 (2.58). The main prey delivered to the chicks for both species are shown in Table 4. There is a remarkable difference in the diet composition of ARTE between 2002 and 2003, with amphipods (36%) and hake (20%) being the most important prey in 2002. The proportion of hake and herring in the diet of both species changed from the first half of the feeding study period to the second half. Thus, hakes were the main prey between the last week of June and the first week of July (ARTE: 44%, COTE: 43%), whereas herrings were the dominant item between the second and third week of July (ARTE: 20%, COTE: 45%).

Table 4. Principal prey items in the diet of ARTE and COTE in Seal Island, 2003

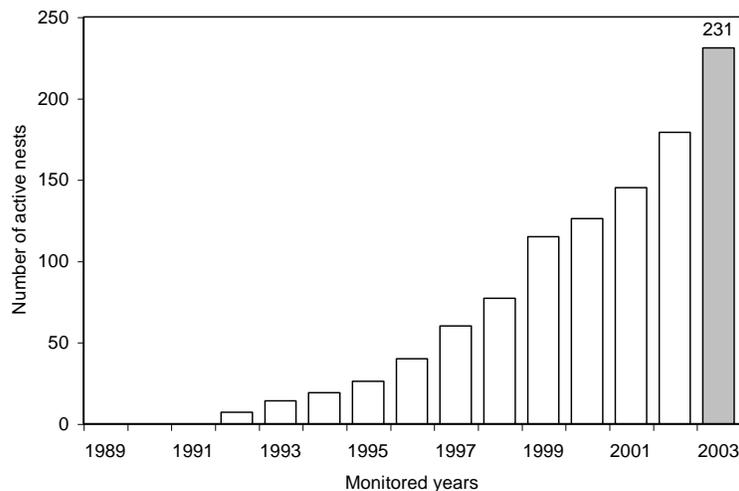
	ARTE			COTE		
	Freq.	% diet	Mean size (mm)	Freq.	% diet	Mean size (mm)
Hake (white hake and small 4-beard rockling)	275	38.46	46.24	233	38.07	51.55
Herring	103	14.41	52.57	130	21.24	61.66
Euphausiids	91	12.73	25.66	116	18.95	33.15
Unknown fish	90	12.59	-----	55	8.99	-----
Amphipods	55	7.69	13.81	23	3.76	28.80

#### Atlantic Puffins

A total of 231 active burrows were observed in 2003, which represents an increase of 28% over last year (Figure 1). Productivity was estimated for a sample of 124 burrows located in areas where the observation effort was the highest. Overall, 615 hours of observations were completed in 224 blind stints. Taking into consideration the sample

size and effort, only 73% of the nests were considered successful (chick fed at least for 21 consecutive days). This index of reproductive success in 2003 was lower than in 2002 (100%). The total number of resighting individuals was a 267, and 10 adult and 21 chicks were banded during this season.

Figure 1. Population trend of Atlantic Puffins in Seal Island,



Predator Control/ Gull Census/Predators

A total of 110 and 113 Great Black-Backed and Herring gulls nests were counted and destroyed on 26-27 May and 16 June 2003. Likewise, 4 Herring gulls were shot while preying upon tern chicks. Predation by gulls was common during the second-half of the tern breeding season. One Peregrine Falcon was a resident bird in Seal Island between the first and last week of June. Carcasses and remains (wings, head and legs) of eight adult terns were collected during this period. One of these terns was a banded Arctic tern (AM45) and another band (CG 75) was found in a falcon pellet near its roosting site. Likewise, the remains of a fledgling Arctic tern banded in Matinicus Rock this year (DH 22) was found in Seal Island by the first week of August..

Other Breeders

One Razorbill nest with an egg was found in late May, but it was unknown whether the chick fledged. A maximum of 23 razorbills and 15 Common murrelets were observed on 13 June and 10 July, respectively. Great and Double Crested Cormorants nested (26 and 20 nests, respectively) on the south-east edge of SINWR, while a minimum of 169 Common Eider nests and several hundreds of Black Guillemots were observed.

Visitors/ Rare Birds/ Student Research

A banded (BBL + yellow plastic band in the right leg) juvenile Black tern was sighted by the intern Olya Milenkaya on 29 July.

**Matinicus Rock**, *Paula Shannon, Island Supervisor, Resident Intern: Jason Wade*Census

We conducted the tern and Laughing Gull nest census on 16-17 June. The total (unadjusted) tern nest count was 1,170 (1,075 nests counted plus 95 productivity and feeding study nests). To determine species ratio, a direct count of Common Tern nests was conducted, yielding 188 COTE nests. COTE nests were subtracted from the nests counted, and the Lincoln Index was applied to ARTE nests only. The ARTE productivity and feeding study nests were then added, yielding an adjusted total of 1022 ARTE nests. Thus the species ratio was 188 COTE/1022ARTE. The total adjusted nest count was 1,210, which is similar to last year's estimate of 1,197.

We counted 597 Laughing Gull nests during the census, which is a decrease of 27 nests from last year's count of 624 nests. Population estimates for Arctic Terns, Common Terns, and Laughing Gulls from the past five years are shown in Table 1.

**Table 1.** Estimated number of breeding pairs of Arctic Terns, Common Terns, and Laughing Gulls at Matinicus Rock from 1998 to 2003.

<b>Year</b>	<b>Arctic Terns</b>	<b>Common Terns</b>	<b>Laughing Gulls</b>
1998	791	97	322
1999	968	102	367
2000	1030	176	355
2001	1014	147	417
2002	999	198	624
2003	1022	188	597

Tern Productivity

We followed 73 Arctic Tern nests and calculated productivity at 0.85 chicks/nest. This is below last year's productivity estimate of 1.31 chicks/nest. We followed 33 Common Tern nests and calculated productivity at 0.88 chicks per nest, which is below last year's estimate of 1.22 chicks/nest.

Predator Observations and Control

In late May and early June, predation on tern eggs by Herring and Great Black-backed Gulls was observed, primarily in one area of the island. A Peregrine Falcon was present on the island at this time and seemed to be the tipping factor in the predation events. The peregrine caused the terns to leave the island, providing opportunity for gulls to eat eggs. After the peregrine left the island, no more widespread egg predation was observed. Large gull control efforts this year included the destruction of 17 Herring Gull nests, two Herring Gulls with broken wings, and one Great Black-backed Gull with a broken wing. We also destroyed 127 Laughing Gull nests this year in order to create a buffer zone between nesting terns and Laughing Gulls.

Tern Feeding Studies

We observed feedings at 22 Arctic Tern nests this year, with 1,513 feedings in 912 hours of observation. We also observed feedings at 6 Common Tern nests, with 217 feedings in 210 hours of observation. The diet composition of Arctic and Common Terns is shown in Table 2.

**Table 2.** Prey items fed to Arctic Tern chicks (a), and Common Tern chicks (b) at Martinicus Rock, 2003.

**a. Arctic Terns**

Prey item	Total Items	Percent of Diet
Hake	672	44.42
Unknown fish	271	17.91
Amphipod	220	14.54
Euphasid	81	5.35
Herring	81	5.35
Other fish	77	5.09
Other inverts	59	3.90
Unknown	52	3.44

**b. Common Terns**

Prey Item	Total Items	Percent of Diet
Hake	52	23.96
Herring	49	22.58
Unknown Fish	40	18.43
Pollock	26	11.98
Butterfish	19	8.76
Other fish	16	7.37
Unknown	8	3.69
Inverts	7	3.23

Atlantic Puffins

We estimated the number of active puffin burrows on the island to be 256 burrows. We also followed 50 nests for productivity and calculated a productivity estimate of 0.88. In addition, we banded 106 puffin chicks and re-banded 5 adults.

Razorbills

We counted 211 active razorbill nests this year, which is an increase of 42 nests over last year's 169 nests. We also estimated Razorbill hatching success by following 60 nests. Fifty-four of the 60 eggs hatched, yielding a hatch rate of 90%.

Common Murres

We relocated the Common Murre decoy colony to an area where murres were observed congregating in 2002. Murres visited the decoys throughout the season, although most murres were usually observed in a group in an area adjacent to the decoys.

Leach's Storm Petrels

We estimated hatching success for Leach's Storm Petrels by following 32 burrows this year. Twenty-seven of the 32 eggs hatched, yielding a hatch rate of 84%.

Manx Shearwater

The manx was heard calling at night throughout the season, and was occasionally seen flying over the island during the day. Two Manx Shearwaters were heard calling on the island in May, and two manx were observed flying over the island in mid-June. We were unable to confirm the presence of more than one manx at any other time during the season. We checked the manx burrow for activity in mid-July by placing toothpicks

vertically in the soil in front of the burrow entrance. The toothpicks were knocked away, indicating that the burrow was being used.

**Penobscot Bay Census, John Drury, Working with a grant from Maine Department of Inland Fisheries and Wildlife**

Wooden ball:

June 22:

Location	Adults Observed	1 egg clutch	2 egg clutch	chicks
150m NE of landing	15 ARTE			
100m east of landing	12 ARTE	1 nest	3 nests	1 nest
Middle of NW shore	1 tern			
Mid NW shore	4 ARTE	1 nest	1 nest	
150 m E of old nest area	5 ARTE			2 chicks
Mid island	2 ARTE		1 nest	

Total: 9 nests found

July 18: Ten adult ARTE were observed: 8 on the shore and 2 vigorously defending the nest area where 5 nests were found on 6/22. Four additional adults were seen near the old nest area on the mid NW shore.

July 26: 16 adult terns were observed (some COTE) on the shore. No fledglings were observed but 8 adults were observed in the nest area. Four additional adults were observed in the mid island nest area.

In 2002, we recorded 7 nests on Wooden Ball, some successfully produced chicks. Two nests were observed in 2000.

Little Green:

June 16: Four ARTE observed on the northern end of the eastern beach. Four nests were observed: 2 with 1 egg, 2 with 2 eggs, and there were 3 scrapes seen as well. We observed 22 nests in 2002.

July 19: Fifteen adult ARTE observed and two fledglings seen on the shore. Adult terns were vigorously defending chicks from a great black-backed gull. The terns were very active and conspicuous. They chased a Merlin off the island, and pursued it towards Large green.

Metinic: Southern end

June 16: We observed 25 adult terns on the beach facing Hog Island. Two of the terns were COTE and the rest were ARTE. We observed 13 nests: 9 with two eggs and 4 with one egg. A second group of ten adult terns (1COTE and 9 ARTE) was found on the west side of the island, 80 meters from the southern tip. We observed four nests, 2 with one egg and 2 with two eggs. In 2002, we documented 15 tern nests found on the southern end of Metinic.

July 19: We observed 40 adult ARTE on the beach facing Hog Island, 25 were loafing on the shore. We observed three fledglings and four large chicks on the shore. Twelve adult ARTE and one fledgling were observed on the west side of the southern tip.

Hog island, (Metinic)

May 29: We observed 12 adult ARTE defending the area on beach facing Metinic Island. No nests were located. We documented 11 ARTE nests on Hog Island in 2002

June 19: No terns were observed.

Great Spoon:

June 17: We observed 80 adult COTE near the western end of the south facing beach. Twenty COTE were roosting on the shore below the nesting area. We counted: 5 nests with one egg, 44 nests with 2 eggs, 16 nests with 3 eggs. A total of 65 nests were observed.

July 21: We observe 45 adult terns vigorously defending the nesting area. The dense beach pea makes surveying difficult, but I observed one chick in it. I observed other adults landing at different locations. I suspect other nests were also successful in producing chicks. In 2002, no terns nested on Great Spoon. No terns have nested on the south east beach for 15 years, and then, they were ARTE.

Brimstone (Burntcoat Harbor)

June 17: We observed 65 adult COTE in the nesting area, and found 9 nests. We documented one nest with one egg, 27 nests with two eggs, and nine nests with three eggs. We counted a total of 45 nests.

July 21: We observed 120 adult COTE, with 35 roosting on the shore. Although we did not observe any chicks the terrain made finding them difficult. Flock size appears to have grown considerably since earlier visit. In 2002, no terns nested on Brimstone, but 60 COTE were observed roosting there on July 13 '02

Dry Money Ledge:

June 17, We observed 25 adult COTE and located 24 nests: 5 nests with one egg, 12 nests with two eggs, and seven nests with three eggs. There were 59 tern nests on the island in 2002.

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July 21, We observed 50 COTE on the shore, and an additional 30 terns near the nesting area. Although no fledglings were observed, we did see five large chicks. This is a vigorous healthy group.

Shore bird ledge, Seal bay Vinalhaven.

June 14, Although I did not locate any terns nesting on the ledge, one adult defended the ledge as I was searching. Perhaps it came from the ledge off Penobscot Island where they have been known to nest before. Interesting that it wanted to defend its old site.

**Islands at which no terns were seen from the boat:** (gulls were flushed where possible to raise the terns), Large Green, Little Two Bush, Yellow Ledge, Hewitt Island Knob, Crescent Ledge, Marblehead, Fisherman's Island, Cutters Nubble,

Jericho bay: The Black Horse, The White Horse, Little Spoon, Western Cowpen, Eastern Cowpen, Spirit Ledge, Mason Ledge, Heron Island (gulls not flushed), Green Island, (Burnt Coat Harbor) John's Island, Gooseberry (Burnt Coat Harbor), High Sheriff, Halibut Rocks, Three Bush, Saddle Back (Jericho Bay), Southern Mark, Southern Poplestone, Green Ledge, (Fog Island), and White Ledge,

Matinicus area: No Man's Land, Two Bush, Ten Pound island, Green Ledge Criehaven,

**Great Cormorants:**

This year, I documented 141 Great Cormorant nests at eight locations. In 2002, there were 191 nests, in 2001: 171 nests, and in 2000: 136 nests. There were 260 nests counted in '92. The trend has been down 8 of the last 10 years, after steady growth between 1983- 1992

Seal Island:

June 3: We observed 23 great cormorant nests and 20 Double crested cormorant nests C nests in the long used nesting area above the western breaker on the western side of the western head. One Great Cormorant nests was in SW cove.

The White Horse:

June 17: We observed 12 GRCO nests and one DCCO nest. This is the first time since 1988 that great cormorants have nested on the White Horse.

July 21: We observed 21 GRCO chicks at 12 nests, and two Double-crested cormorant nests. The chicks were a variety of ages, but most were at least  $\frac{3}{4}$  the size of adults.

Great Spoon Spit:

June 17: We counted 34 GRCO nests, and 56 adult cormorants.

July 21: We counted 54 GRCO chicks at 29 nests.

Little Spoon North west:

June 17: We counted 14 Great Cormorant nests, and 45 Double crested Cormorant nests

Little Spoon South East:

June 17: We did not observe any GRCO nests, but located 23 Double crested Cormorant nests. This is the first time since 1985 that this site has not been occupied by GRCO.

Brimstone (Burnt Coat Harbor):

June 17: We counted 21 GRCO nests: 7 with three eggs, 8 with four eggs, 2 with one egg, 1 with two eggs, 1 with five eggs, and 1 nest with 3 eggs and a recently hatched chick. One additional nest had 4 chicks, approximately 2 days old.

July 21: We observed 36 GRCO chicks at 14 nests.

John's Island:

June 17: We observed 3 DCCO nests on the southern shore. No GRCO nests were observed. We observed 36 DCCO nests on the NE corner, and 8 GRCO nests.

There were no nests in 2001 and 2002.

July 21: All the cormorant nests that were on the NE corner have been abandoned

Green Ledge:

June 17: We counted 22 GRCO and 20 DCCO nests.

July 21: Only two adult GRCO were observed standing at nests, all other nests have been abandoned.

Summary:

From a sample of 94 nests at five colonies counted June 17 (66% of total nests), we counted 111 chicks on July 21. We did not observe any chicks at John's Island where there had been 8 nests observed earlier in the season. No chicks were observed at Green Ledge where there had been 22 nests on June 17th.

At the other three colonies (The White Horse, Great Spoon Spit, and Brimstone) where we counted chicks on July 21 there was an average 1.7 large chicks per nest.

It is possible that the growing eagle population in outer Penobscot Bay may be partially responsible for the recent decline in the GRCO breeding population. Last year the Cormorants on Green ledge (Jericho Bay) persisted in the shadow of the eagle nest on Fog Island which is less than half a mile away. In 2003, the colony abandoned the island, perhaps due to predation pressures from the eagles. We have observed increasing numbers of eagles on the islands SE of Vinalhaven, often five or six eagles in late August on Little Roberts, Roberts and Otter. We observed eagles driving the young cormorants on Little Roberts and Seal Island to the edge of the water and into the water during the last weeks in August.

### **Manx. Shearwater**

In 2003 we observed an increase in Manx shearwater activity around Matinicus Rock during late May. Nine individual manx we observed flying around the island and on two evenings roosting with the laughing gulls. There were at least two individuals heard calling at night.

### **Metinic Island, Megan Brown, Island Supervisor**

#### Productivity

The 2003 season had fairly good productivity; however, it was lower than the past two seasons most likely because there was a very large increase in the amount of nesting pairs on Metinic Island and an increase in competition for resources. Figure 1 summarizes the numbers of nesting pairs on Metinic Island from 1984-2003 and Table 1 summarizes the 2003 season productivity. Notice differences in productivity after the 15 day fledge mark.

Figure 1. Tern nesting totals for the north end of Metinic Island, 1984-2003.

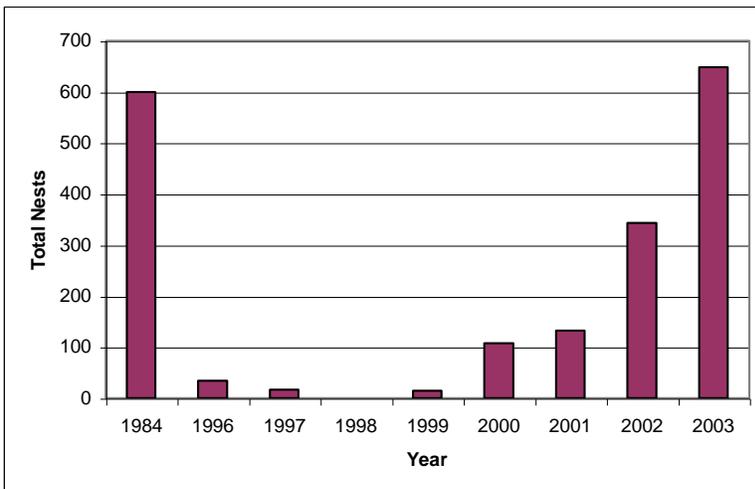


Table 1. Arctic and Common Tern productivity values, Metinic Island 2003

<b>Productivity Measure</b>	<b>Arctic Terns</b>	<b>Common Terns</b>
Average clutch size	1.95 ± 0.22	2.43 ± 0.51
Average hatching success	93.56%	92.47%
Average fledging success (hatched chicks surviving to 15 days)	73.18%	84.87%
Average fledging success (hatched chicks surviving to end of season)	73.18%	75.44%
Average reproductive success (chicks surviving to 15 days)	67.40%	77.59%
Average reproductive success (chicks surviving to end of season)	67.40%	69.47%
# Of chicks fledged/nest (chicks surviving to 15 days)	1.33 ± 0.34	1.73 ± 0.42
# Of chicks fledged/nest (chicks surviving to end of season)	1.33 ± 0.34	1.54 ± 0.50

#### Provisioning data

A total of 11 Arctic Tern nests and 8 Common Tern nests were watched regularly and followed most of the season for the feeding study. The total amount of provisioning hours for the 2003 season was 72.53 in which a total of 650 feedings were witnessed. On average Arctic Terns fed their chicks 1.43 times/hr, and Common Tern chicks fed their chicks 1.36 times/hr. The diet of Arctic Terns consisted of 51.4% Hake, 27.8% Herring, 5.8% Butterfish, 11.8% unknown, and 13.1% Invertebrate. The Common Tern diet consisted of 54.5% Hake, 18.5% Herring, 8.8% Butterfish, 2.7% Polluck, 11.5% unknown, 2.7% Invertebrate, and .77% Sculpin. One speculation concerning decreased productivity may have been caused by the Butterfish diet, which most tern chicks could not ingest.

#### Predators

Predator levels were low this 2003 season. The nesting Merlin on Metinic Island killed five tern chicks. Great Black-backed Gulls depredated three tern chicks and one tern chick was taken by a Herring Gull. An adult Herring Gull killed an adult Common Tern and attempted to eat it in the intertidal of the colony. The strangest known predator on Metinic Island would be the many garter snakes on the island; several day old chicks disappeared this season, and a garter snake was found engulfing a two-three day old chick in the hillside colony.

#### Unique Species

A total of 97 different species were seen on Metinic this season. To name just a few seen: Scarlet Tanagers, Harlequin Ducks, Atlantic Puffins, breeding Roseate Terns, a Dovekie, American Oystercatchers, Black Terns, Bald Eagles, breeding Ospreys and Merlins, and many more.

**Eastern Egg Rock, Ellen Peterson, Island Supervisor**

Introduction:

Eastern Egg Rock is a seven-acre island six miles offshore of New Harbor, Maine in the outer waters of Muscongus Bay. Eastern Egg Rock is owned by the Maine Department of Inland Fisheries and Wildlife, and managed by the National Audubon Society.

Census:

All Arctic Tern (*Sterna paradisaea*) and Roseate Tern (*S. dougallii*) nests were located and flagged by direct observation, so that species differentiation during census was unnecessary. The nest count census was conducted on the 17<sup>th</sup> and 18<sup>th</sup> of June. We censused Common Tern (*S. hirundo*), Laughing Gull (*Larus atricilla*), and Common Eider (*Somateria mollissima*) nests. Nine hundred and ninety-two COTE pairs nested on Eastern Egg Rock (Lincoln adjustment =1.022), down 11 nests from last year. There were 77 ARTE nests, also down from last season. One hundred and sixty three ROST nests were found, slightly up from last season.

**Table 1: Census Numbers, Nesting Pairs 1995-2003**

Year	COTE	ARTE	ROST	LAGU
2003	992	77	163	1466
2002	1003	81	160	1176
2001	1514	92	145	1252
2000	1443	85	165	966
1999	1110	91	149	660
1998	1293	81	144	575
1997	1389	94	138	555
1996	1261	79	126	460
1995	1159	45	86	234

Tern Productivity:

Fifty-one COTE nests, 47 ARTE nests and 49 ROST nests were monitored for productivity this year, using fenced or unfenced plots and feeding study nests. Common tern productivity was slightly higher this season at 0.97. ARTE productivity was half of what it was last season, possibly reflecting the larger sample size that included more of the island. ROST productivity was slightly down from last season but higher than previous years (1999-2001). The extremely wet weather and the uncontrolled HERG and GBBG predation probably effected productivity this summer. Christina Donehower conducted a predation study this season and will be presenting her findings today.

**Table 2: Tern Productivity 1996-2003**

Year	COTE	ARTE	ROST
2003	0.97	0.64	0.92
2002	0.9	1.2	1.1
2001	0.4	0.3	0.4
2000	1.08	0.76	1.28
1999	1.07	0.2	1.24

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1998	1.17	NA	0.84
1997	1.66	NA	1.47
1996	0.51	NA	0.82

Tern Feeding Study:

Twelve COTE nests, 6 ARTE nests and 10 ROST nests were monitored for the chick provisioning study. The prey delivery percentages for each species are summarized in Table 3. Common Tern feeding rate was the highest, 1.41 items per hour. The ARTE feeding rate was 1.36 items per hour and ROST was 1.22.

Table 3: Prey Item Percentages observed in Tern Feeding Study

Species	Hake	Herring	Invertebrate	Butterfish	Unknown Fish	Pollock
COTE	53.65	13.41	5.94	7.81	12.39	1.70
ARTE	49.07	7.44	19.53	1.16	16.98	1.16
ROST	37.08	8.51	0	0.91	45.29	3.65

Laughing Gulls:

The south end of Eastern Egg Rock was essentially gull-free this season again. We broke the eggs of 648 laughing gull nests, island wide. In zone 1, a ten-meter buffer zone was created (94 nests broken), while in zone 3 and 4 all of the LAGU nests were broken (554). We did not attempt to monitor LAGU productivity or diet this season.

Atlantic Puffins:

The puffin population increased from 52 burrows to 58 active burrows this season. ATPU productivity is 0.86. We were able to grub and band two chicks and trap 19 unbanded adults. All thirteen of the adopt-a-puffins returned to the island this season to breed, some of them 27 years old and still able to produce chicks.

Other Notes:

Common Murre and Razorbill sightings this season were common. A record high of 8 razorbills were seen circling one June morning. There were two periods when a Manx Shearwater visited the island for multiple nights. On one night there may have been two individuals calling.

**Pond Island NWR, Matthew D. Martinkovic, Island Supervisor**

Introduction

Pond Island's seventh field season began on May 20<sup>th</sup> with the installation of the social attraction equipment. Audubon wardens resided on the island from May 27<sup>th</sup> to August 7<sup>th</sup>. Research activities focused on primarily on predator management and the response of Common Terns (*Sterna hirundo*) to restoration techniques.

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### Census

Table 1: Population Numbers of COTE

Year	GOMSWG	P. GOMSWG	Total
2002	109	98	207
2003	310/ No LI	27	337

Matthew Martinkovic, Charlotte Peterson, Marc Chipault, Brian Benedict and Cricket Tupper performed the census this year on June 16<sup>th</sup>. The population increased again this season by 130 total nests. There was not large quantity though after the census time frame. During the census there were 2 Roseate Tern (*Sterna Dougallii*) nesting on the island. Table 1 indicates the changes from last season.

### Productivity

Table 2: 2003 COTE Productivity and Clutch size

Year	Avg. Clutch Size	Hatching Success	Fledging Success
2002	2.8 (.41)	2.43	1.55 (1.18)
2003	2.2 (.56)	1.67	1.1 (1.1)

This year's productivity was down from last season but not by a significant amount. In 2002 it was 1.55 fledgers per nest while this season was 1.1 fledgers per nest. The average clutch size was 2.2 eggs/nest in sample size of 40 nests. The hatching success was 1.67 chicks hatched/ nest. Both Roseate pairs fledged their 1 chick. There were a lot of factors affecting productivity this season. First the "Funk", was seen throughout the colony. 26.7 % of the chicks hatched showed signs of the "Funk". 16.6 % recovered from the symptoms and fledged. The second reason for productivity was the presence of 4 Great Horned Owls.

### Feeding

In a study sample of 19 nests the most abundant prey item delivered was Sand Launce (32.6 %). Atlantic Herring was 22.7 % of the items delivered while White Hake was 16.2%. However there were 17.3 % of Unknown items delivered. There was a total of 409 hours of nesting observations. The feeding rate was 2.09 items per hour.

Table 3: Prey Items delivered

Prey Item	Percent	Total Number
Sand Lance	32.6	274
Atlantic Herring	22.7	191
Unknown	17.3	145
White Hake	16.2	136
Other	11.2	94

### Predation

Since the beginning of the restoration effort the island has had frequent predation from Great Horned Owls. This season was the largest known amount of owls feeding on the island. Researchers once again set up leg hold traps throughout the major locations on the island. There was a total of 717.25 trapping hours during the season. This was a decrease from previous years but a more successful outcome. There were 4 owls (unbanded) trapped on the island in which 3 were shot on the island. The first one was banded and released 300 miles inland and never returned during the season. Also there was a decrease of night stint hours this season. There was only 30 hours spent on night stints.

### Common Eider

A random 40 Common Eider (*Somateria mollissima*) nests were randomly marked and followed to estimate productivity. These nests contained a total of 170 eggs for an average clutch size of 4.25 eggs/nest. Results show 54% hatched, 24 % depredated, 12% abandoned, 4 % Unknown. Throughout the season there was more predation from Common Ravens than Great Black Backed Gulls. There were only a few instances where ducklings were predated.

A supplement to the Pond Island Report: Kennebec Point Report, *Walter Gamble*

Well...It's been a relatively quiet summer here...where all the terns are good looking, and all the interns, volunteers, and supervisors are above average... but there have been a few problems with predation. Since our application to the Federal Government for a grant to deforest the region was rejected, the surrounding woods are still harboring great horned owls. Four found their way to Pond Island in search of food and have departed by one means or another. Also, another predator, 2 legged and flightless, lumbered through the colony, destroying eggs and nests, and was undeterred by shouts and waving signals from the Island staff. On shore, our freezer temporarily housed small jars containing victims of an apparent germ warfare. The agent is yet to be identified. On the positive side, much to the credit of interns, volunteers, and supervisor, the productivity of the island was terrific. We are now serenaded by large numbers of terns fishing in the bays about our home. Even a pair of endangered Roseate Terns successfully nested on the

island. There have been a number of improvements this summer. The Fog Horn is no longer stuck “turned on” and local residents are able to sleep on clear starry nights. A second small rowing boat provides transportation from a mooring to the beach, while a larger inflatable makes the run to the island. However, much more needs to be done!

Since the Federal Government is putting so much effort into Homeland Security, their aerial surveillance could be extended to cover Pond Island, and put a defense shield around it to prevent Great Horned Owls from getting there. The success in Outer Green Island suggests that if we moved Pond Island further out to sea, there would be less probability that the owls would get here. Finally, we have been reading about bird behavior, and specifically about establishment of territories. The loon, for example, uses its call to insure adequate spacing between nests. In other words, certain bird calls can act as a repellent against its own species. This is the opposite of what has been so successful in the seabird restoration projects, where the calls have been played 24 hours a day to attract more to the colony. We think that owls, like the loon, use their calls to keep competitors from their territory. In view of this, we felt that Matt, or his successor, should be provided with an audio system consisting of proper Owl calls and a decoy to keep the island “owl free.” Matt, will you please come up. We are honored to present Matt with the first complete Owl repellent system.

Matt is presented with a small stuffed owl toy that HOOTS when squeezed.

**Jenny Island**, *Matthew D. Martinkovic, Island Supervisor*

Introduction:

This is the second year Jenny Island was managed as a satellite of Pond Island NWR. Audubon Wardens visited the island 17 days including 4 overnights. During July 2<sup>nd</sup> through July 10<sup>th</sup> there was a temporary crew residing on the island. The island was officially opened on June 4<sup>th</sup> and closed on August 1<sup>st</sup>. Research activities were mainly focused on predator management, productivity and feeding observations of Common Terns (*Sterna hirundo*).

Census:

Table 1 *GOMSWG Nest Numbers, COTE*

Year	GOMSWG	Post GOMSWG	Total
2002	397		397
2003	457/468	19	487

The 2003 census was done by Matthew Martinkovic, Charlotte Peterson, Marc Chipault, Bob Houston, Randy Peterson on June 16<sup>th</sup>. The numbers were up from last year totals. This season the corrected total was up 70 pairs last year. There were also 19 late nests at the end of the season. Table 1 indicates the population the past 2 years.

Productivity:Table 2 *Productivity of COTE Population*

Year	Avg Clutch Size	Hatching Success	Fledging Success
2002	2.53 (.61)	1.44 (1.21)	0.28 (.51)
2003	2.3 (.56)	1.92	1.5 (1.04)

Productivity was up a tremendous amount from last season. Table 2 indicates the increase. The productivity was 1.5 fledgers/nest with an average clutch size of 2.3 eggs/nest. The productivity was higher than the past few years due to lack of depredation. The productivity could have been higher if more hours were spent on the island, locating chicks in the feeding study plots.

Feeding

There were 16 study nests in this years feeding study. There was a total of 279 hrs spent on observing these nests. There was a total of 233 feedings observed in this time. The feeding rate was .84 items/hour. Table 4 indicates the numbers for each study blind. White Hake was the dominant prey item once again in 2003. Hake made up 45.5 % of prey items delivered. Atlantic Herring was approximately 27.5 % of the items delivered. Table 3 indicates the percents of the different items delivered.

**Outer Green Island, Joseph J. Kocsis, Island Supervisor**

Outer Green Island is a 5.6-acre island 5 miles east of Portland. It is approximately 2 miles from the nearest islands (Jewel and Peaks).

Common Tern (*Sterna hirundo*) decoys and recordings were set up May 3<sup>rd</sup>, this year, on the island's south end. The first pair of Common Terns (*S. hirundo*) landed on the island on May 7<sup>th</sup>. The first nests were found May 25<sup>th</sup> on the southeast ledge.

Nesting activity continued through to the closing date of July 30<sup>th</sup>. The GOMSWG census resulted in 94 nests, an increase of 83 nests from the previous year. The post-GOMSWG count conducted on July 10<sup>th</sup> added another 35 nests. A third unmarked nest count was conducted on July 26<sup>th</sup> resulting in 31 new nests. The total count for the season equals 160 Common Tern nests.

Census: June 16<sup>th</sup>

Species	# Nests	# Eggs/Clutch
COTE	94	2.64

Tern Productivity - The mean hatch for the island was 2.09 chicks/nest. The number of fledgers per nest was 2.09. Fourteen nests were observed and monitored in two set locations on the island. Due to the lack of fenced enclosures, chicks tended to move

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permanently away from original nest locations, therefore unable to be further monitored. This resulted in the elimination of 3 of the 14 nests from the original study plots.

Island Productivity

Hatch Success	Fledging Success	Reproductive Success
93%	85.19%	79.3%
2.45 eggs/pair	2.09 chicks/pair	

Feeding Study - Feeding studies were initially carried out on 14 nests in 2 locations for a total of 1223 observation hours. The locations served as both the feeding and productivity plots. As in productivity, the lack of the fenced enclosures resulted in three of the nest locations spreading out of observable range. As a result of this, one of the feeding studies was ended early. Predominate food items this year were White Hake and Atlantic Herring.

Primary Prey Item Abundance

Prey Item	Total Items	Percent
White Hake	1083	42.12
Atlantic Herring	715	27.81
Pollock	296	11.51
Unknown	406	15.79

Feeding Rate / Blind

Blind	Feedings	Hours	Rate
Filmore East	1969	919	2.14
Filmore West	602	304	1.98
Total	2571	1223	2.10

Gull Control – Herring (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*) were the predominate species on the island. Double-crested Cormorants (*Phalacrocorax auritus*) and Common Eiders (*Somateria mollissima*) either abandoned or were predated shortly after arrival to the island. All gulls were discouraged from nesting with the use of pyrotechnics and human presence. There were 25 HERG and 13 GBBG nests destroyed throughout the season. Lethal gull control was unnecessary this season.

Gull Control Effort

Species	Gulls Shot	Nests Destroyed
HERG	0	25
GBBG	0	13

Other Island Notes: Roseate Terns (*Sterna dougallii*) were first seen June 20<sup>th</sup>, 2 - 3 were observed on a regular basis for the remainder of the season. Throughout the season, there were 113 different species of birds seen on or from the island. This island remains to be a major migration stop for songbirds. Also, a North American River Otter (*Lontra canadensis*) was observed in the inter-tidal zone on July 16<sup>th</sup>, disturbing the colony but leaving it unharmed.

**Western Casco Bay, Jane Arbuckle & Bob Houston**

Clapboard Island Ledge, south, Falmouth (55-330)

Survey on June 12 by boat revealed 1 pair of common terns with one of them appearing to be on a nest on the southern tip of the ledge. Total count of one nest for the ledge is down from 5 last year. No productivity estimate. Nesting common eiders present.

College Island, Long Island (55-365)

Survey on June 12 by boat, no terns seen.

The Nubbin, Yarmouth (55-223)

Survey on June 12 by boat revealed 1 pair of common terns flying about the island with no obvious nest. One nest reported for last year. No productivity estimate. Nesting common eiders present.

French Island Ledges, Freeport (55-268, 55-269, 55-270)

Survey on June 12 by boat, no terns seen. No terns on these ledges for the past 20 years. Osprey nest present.

Sister Island Ledge, Freeport (55-237)

Survey on June 12 by boat revealed 6 pairs of common terns with a probable 6 nests. One nest recorded last year and no nests in 2001. No productivity estimate.

Grassy Ledge, Harpswell (55-259)

Survey on June 12 by boat, no terns seen. No terns on this ledge since 1995.

Black Rock, Harpswell (55-252)

Survey on June 12 by boat, no terns seen. No terns on this ledge for 20+ years.

**Stratton Island, Shawn Devlin and Hilary Walter, Island Supervisors**

Censuses:

Wading Birds:

Conducted May 22, 25, 26, 27, 28

Glossy Ibis	Snowy Egret	Black-crowned Night Heron	Great Egret
110	126	36	11

Cormorants:

Conducted July 14

Bluff Island	124
Stratton Island	Unable to census

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Terns:

Conducted June 18

Species	No.
Roseate Tern	40
Common Tern	305
Artic Tern	4

Population trends from 1997-2003.

	1997	1998	1999	2000	2001	2002	2003
Common Tern	821	969	1109	1109	1881	1279	305
Roseate Tern	66	86	100	104	127	98	40

Tern Productivity:

	hatch/nest	Fledge/nest
Common Tern	0.9	0.2
Roseate Tern	0.05	0.05

Factors affecting productivity:

The presence of a mink was discovered on May 16. A nest was found in a storage shed on the edge of camp. Several kills were found in the storage shed along with what seemed to be a nest and a toilet area. Several traps were set around the shed to no avail. After several consultations with local trappers and one visit from Dave Yates, with Biodiversity Research Institute, the mink was trapped on July 6<sup>th</sup>. A variety of trapping methods were employed including leg-hold traps with scent and without scent. Live traps set blindly, containing scent, motion (a Feather was tied inside the trap to draw the mink in) and traps baited with fresh meat were all engaged. A blind set live trap placed in pathway that was obscured except for the mouth of the trap captured the mink.

Approximately 5 Roseate Tern kills and two Common Tern kills were found in the colony but the total amount of predation cannot be determined because a food cache was never found. At least one Common Tern chick was found with wounds congruent with mink predation. Several chicks from feeding study nests disappeared and assumed to have been taken by the mink. Along with direct predation of terns, the mink's presence caused severe nocturnal abandonment, which dramatically reduced productivity (especially Roseate Tern productivity). The terns continued to abandon every night for the remainder of the season long after the mink was trapped.

The next obstacle for the Stratton Island colony was the "Funk", which affected 20-30% of the colony. Chicks suffering from the "Funk" had any one or many of the following symptoms:

- Bloody/raw nasal cavity
- Bloody/raw legs that were quite thin/emaciated
- Puffy and/or crusted eyes
- Patchy feather development, skin appeared puffy

- Chicks were very lethargic, sometimes with shaking/trembling
- Yellowish feces around cloacae of chicks and adult terns defecating yellowish feces

Severity of the “funk” was not as pronounced as it was last season. Symptoms remained the same by the intensity was less acute. Several chicks did die from the “funk” and none were known to recover. Every nest was individually monitored in hopes of tracking the outbreak with better documentation. This proved to be a useful way to observe the “funk” and monitor its degree of severity.

Other points of interest included two successful American Oystercatcher nests and two successful Black Guillemot nests. Visitation decreased to only 268 visitors, compared to 533 in 2002 most likely due to bad weather.

## **Least Tern Colonies:**

**Maine Beaches**, *Jordan Perkins, University of Maine, Dept. of Wildlife Ecology*

### Crescent Surf Beach:

A minimum of 66 Least Tern pairs were documented. On June 6-9, a group of 3 crows predated all 46 nests present. The 13 nests laid from June 10 until June 20 were also predated until Rachel Carson NWR was able to successfully eradicate 2 of the 3 crows. Great Horned Owl predation occurred from July 8-10 predated 10 nests. Lastly, coyotes predated 16 nests on the night of August 5. Overall 51% of the nests were predated, 16% were successful, and 15% were lost to high tides. Crescent Surf Beach also was one of two beaches at which we color-banded chicks to document survival rates and fledgling residency time. There were approximately 50 chicks banded at Crescent Surf Beach.

### Laudholm Beach:

A minimum of 9 Least Tern pairs were documented. This colony was predated throughout the season by fox, crow, and Great Horned Owl throughout the summer. Overall, 81% of the nests were predated, 5% were successful, and 14% were lost to high tides. A White-winged Tern was also present from June 13-15.

### Higgins Beach:

A minimum of 51 pairs nested at Higgins Beach. Higgins Beach was our only beach this summer to have minimal predation and mostly successful nests. Of all nests, 71% were successful, 15% were lost to high tides, and 13% were abandoned. Higgins Beach was one of two beaches at which we color-banded chicks to document survival rates and fledgling residency time. There were 55 chicks banded and observed at Higgins Beach. Many adults are thought to have moved to Higgins Beach after the abandonment of Crescent Surf and Laudholm Beaches.

### Half Mile Beach:

This beach at Reid State Park had a substantial colony this year. There was a minimum of 40 pairs present. Although the colony was large it was eventually deserted after

extensive mink (ermine?) predation. Seagull predation was also documented on the edge of the colony. Overall, 64% of the nests were predated, 67% were lost to high tides, and 20% hatched.

Mile Beach:

This beach at Reid State Park had nesting initiated after predation on the adjacent Half Mile Beach. Seven pairs nested here with 43% hatched, 14% lost to high tides, and 43% had an unknown outcome.

Goose Rocks Beach:

This beach has not had nesting pairs since 1998, and had not produced fledglings since 1988. Nesting by a minimum of 16 pairs was initiated here after the abandonment of Crescent Surf and Laudholm Beaches. Fox predation led to the eventual abandonment of this colony. Overall, 94% of the nests were lost to predation and 6% water loss.

**New Hampshire Tern Colonies:**

**White and Seavey Islands.** Diane De Luca, Steve Fuller, Dan Hayward, Melissa Barney and Joe Derrick, Audubon Society of New Hampshire and NH Fish and Game Department

Introduction: White and Seavey Islands are a 3-hectare island complex located nine miles from the mouth of the Piscataqua River. In 1997, the New Hampshire Fish and Game Department and the Audubon Society of New Hampshire began a tern restoration project at this site using non-lethal gull control techniques.

Census: The census was conducted on June 15-16 by five NHFG and ASNH biologists. Roseate and arctic tern nests were all marked and confirmed visually either before or after the census. The numbers were up substantially with the COTE population doubling from 2002 to 2414 pairs, roseate pairs climbing from 8 in 2002 to 42 in 2003, and Arctic terns going from one pair in 2002 to 4 pairs in 2003.

Census Results:

Species	COTE	ROST	ARTE
Date	6/15/2003	6/15/2003	6/15/2003
	2317/2414	42	4
Additional Nests After Census	*	21	2
Season Total Nests	2414	63	6

Lincoln's Index	Marked Nests	121	Unmarked Nests	5

\*No B-wave census due to visual estimate of <200 new nesting pairs or re-nesters on 7/12/2003

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Year by Year Comparison

Species/Year	1998 (pairs)	1999	2000	2001	2002	2003
COTE	25	80	318	460	1273	2414
ROST	0	0	0	1	8	42
ARTE	0	0	0	0	1	4

Year by Year Comparison (Season Totals)

Species/Year	1998 (pairs)	1999	2000	2001	2002	2003
COTE	45	140	446	809	1687	2414
ROST	0	0	0	1	26	63
ARTE	0	0	0	0	1	6

Tern Productivity:

Productivity was lower for COTE this year than it was in previous years. Some of this may be attributed to the lower clutch size. The census numbers showed a high percentage of 2-egg clutches bringing the mean clutch size down to 1.96. There were no significant weather events, although many of the chicks found dead were older and appeared to be food stressed. ROST productivity was the same as in 2002 and also reflects a high number of one-egg clutches. ARTE did well with increase in both numbers and productivity. Gull predation was evident as the chicks began to fly with 27 COTE chicks confirmed taken.

COTE [Season Totals]

Year	1998	1999	2000	2001	2002	2003
Nests Monitored	45	25[140]	43	73	184	163
Mean Clutch Size	2.33	2.84	2.60	2.44	2.52	1.96
Mean Hatch	2.02	2.48	2.33	2.18	2.09	1.61
Fledglings/Nest	1.6	2.24[1.71]	1.58	1.68	1.63	1.33
Total Fledglings	72	314[240]	502	773	2075	3212

ROST [Observed Season Totals]

Total Fledges based on Census Productivity applied to Season Total Nests\*

Total Fledges based on Season Productivity applied to Season Total Nests\*\*

Year	2000	2001	2002	2003	2003
Nests Monitored	-	1	8	30[47]	
Mean Clutch Size	-	1	1.38	1.40[1.34]	
Mean Hatch	-	1	1	1.07[1.06]	
Fledglings/Nest	-	1	0.88	0.87[.89]	
Total Fledglings	-	1	7	26[42]	*55, **56

ARTE [Season Totals]

Year	2000	2001	2002	2003
Nests Monitored	-	-	1	4[6]
Mean Clutch Size	-	-	2	1.5[1.5]
Mean Hatch	-	-	2	1.5[1.5]
Fledglings/Nest	-	-	0	1[1]

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Total Fledglings	-	-	0	4[6]
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Predator Control:

Three nests were interrupted during the initial gull census. Pyrotechnics and regular sweeps of the island continued through the field season. Three HERG and one GBBG were taken as predation escalated in late July.

Species	Nests Destroyed	Eggs Destroyed	Adults Taken
GBBG	1*	0	3
HERG	4*	0	2

\*Nest Process interrupted with Rock in Nest Cup – No Eggs Destroyed

Gull Control (Apr29-Aug6)

Control Method	Ave/Day	Control Method	Ave/Day
C, W	2.39	22	0.11
R	0.33	PG	0.05
W	1.07	C, R	0.12
C, R, W	0.81	NED	0.06
S	1.26	L	0.01
C	0.90	R, W	0.01
B	0.10	P	0.54

C-Clapping/Waving Arms      22-.22Cal. rifle  
 R-Rock Thrown                      PG-Problem gull taken w/22  
 W-Walking                              NED-Nest/Egg Destruction  
 S-Screamer                              RK-Injured Gull Taken  
 P-Cap                                      B-Banger

Other Nesting Species

Species	COEI	SPSA	ABDU
# Of Nests	~20	~15	1

Other Tern Sightings, Rare Birds, and Interesting Observations:

7/27/03 – A COTE juvenile with a bright blue dye covering its neck, side of head and part of breast was observed on the exterior of the colony. Staff on Seavey Island used no dye of this type. The COTE was not banded.

Other birds of interest included: American Oystercatcher – 6/28/03, 7/13/03 ,Atlantic Puffin – 6/15/03, 6/21/03, 6/24/03, Black Tern – 5/2/03, 6/2/03, 7/13/03, 7/15/03, 7/22/03, Common Murre – 5/26/03, 6/22/03, 6/27/03, 7/28/03, Royal Tern – 7/26/03, Thick-billed Murre – 6/14/03

**Massachusetts Colonies:**

Monomoy Islands, *Monica Williams, USFWS*

North Monomoy

Census: On 15 June, one observer counted 26 COTE adults above the historic nesting area, but found no scrapes or nests. No nests were found throughout the season. A small number of COTE have nested on North Monomoy in previous years (36 pairs in 2002, 5 pairs in 2001) with nesting success. The nesting area is subject to flooding during high tides and strong westerly winds.

South Monomoy**COTE:**

Census: On 14, 15 and 16 June a total of 8616 COTE nests were counted in 30 m<sup>2</sup> grids on the north tip of South Monomoy. A Lincoln Index adjustment brought the total to 8727 nests. This is an 8.6% increase from the 8032 nests counted in 2002. A second census was not conducted, but an additional 84 nests (21% of the total 403 nests) were initiated in productivity enclosures after the census window, indicating an additional 2307 nests after 20 June.

Productivity: Productivity estimates were based on 319 A-count nests in 30 fenced productivity enclosures located throughout the colony.

Average clutch size: 2.50 eggs/nest (SD = 0.63, N = 319 nests) 2.20 in 2002

Hatching success: 1.88 eggs/nest (SD = 1.09, N = 319 nests) 1.34 in 2002

Reproductive success: 1.26 chicks/nest (SD = 1.04, N = 319 nests) 0.71 in 2002

Number of pairs and Productivity of Common Terns on South Monomoy Island; 1999-2003

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Number Pairs	5480	6886	7807	8032	8727
Productivity	1.60	1.83	1.20	0.71	1.26

Feeding stints were conducted following the same protocol used since 2001. For each hour-long stint a study area was delineated and species, size and receiver were recorded for every prey item brought to study nests. In general, sand lance was the most commonly delivered prey item (same as in previous years).

Monomoy NWR served as an unoiled reference site in a study examining the effects of terns exposed to oil from the Bouchard Spill (27 April 2003) in Buzzards Bay. However, during the nesting season, at least 30-oiled COTE were observed throughout the colony, many of which had chicks. Birds were seen with light to moderate amounts of oil on various parts of the body. It is uncertain where the birds picked up the oil since no oil was found on the refuge.

***ROST:***

Census: Three ROST nests were counted on 15 and 16 June (same nest total in 2002). Observers continued to search for ROST nests throughout the season.

Productivity: ROST nests were checked nearly every day; chicks were weighed from day 0-2.

Average clutch size: 1.33 eggs/nest (SD = 0.58, N = 3) *2.00 in 2002*  
 Hatching success: 1.33 eggs/nest (SD = 0.58, N = 3) *1.33 in 2002*  
 Reproductive success: 1.33 chicks/nest (N = 3 nests) *1.00 in 2002*

Numbers of pairs and Productivity of Roseate Terns on South Monomoy Island; 1999-2003

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
Number Pairs	27	3	6	3	3
Productivity	0.78	1.00	0.83	1.00	1.33

***LETE:***

Census: On 16 June, 62 LETE nests were counted on the south tip of the island. On 30 June, the total nest count increased to 143 nests, but later decreased to 71 nests on 4, 5 July. Nesting LETE increased from 2002, when 6 nests were counted mid-June and 50 nests were counted mid-July.

Productivity: Productivity was probably low based on the few chicks seen. Coyote tracks and gull tracks were seen frequently in the colony.

***LAGU:***

Census: On June 14, 15, and 16, 1200 active LAGU nests were counted, up from 1106 in 2002.

Productivity: Productivity information was not taken this year but was assumed to be fair to good. A number of laughing gull fledglings were observed at the end of the season.

**Minimoy:**

Minimoy is a small new nesting site off of the northwest side of South Monomoy Island. This site was discovered on 1 July and subsequently visited throughout the season.

***COTE:***

Census: On July 1, 1280 COTE nests were counted. This number is based on a high count of 1600 adult terns seen flying above the colony and on the estimate that 2/3 of the nests counted had chicks during the time of census. Nests on the east side of the island were subject to flooding at high tide.

Productivity: Productivity was not monitored.

**ROST:**

Census: On July 1 and 5, 10 ROST nests were discovered. On July 16, 5 additional nests were found. Hatch date and chick age were used to determine if nests belonged in the A or B window.

Productivity: Productivity was estimated for the 10 A-count nests.

Average clutch size: 1.90 eggs/nest (SD = 0.57, N = 10)

Hatching success: 1.70 eggs/nest (SD = 0.48, N = 10)

Reproductive success: 1.70 chicks/nest (SD = 0.48, N = 10)

**BLSK**

Census: Monomoy NWR was the only nesting site in Massachusetts for BLSK. Three BLSK nests were counted on July 1. Four more nests were located during a second count on July 16. Hatch dates and chick age were used to determine whether nests belonged in the A or B window.

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

Average clutch size: 3.50 eggs/nest (SD = 1.0, N = 4)

Hatching success: 3.25 eggs/nest (SD = 0.96, N = 4)

Reproductive success: 2.00 chicks/nest (SD = 0.82, N = 4)

**LETE**

Census: On July 8, 6 LETE nests were counted however, the nests were not success due to overwash.

**LAGU**

Census: During a census on July 1, no LAGU nests were found. Observers continued to survey the area for LAGU throughout the season.

**PREDATORS**

***GBBG AND HERG:*** Gull harassment in area A was initiated 28 March. Two harassments were conducted in April, 31 in May, 11 in June, and 5 in July. A census was conducted on 15 May; 111 nests were counted in Area B (169 in 2002) and 1 nest was found in Area A (3 in 2002). Nearly two-thirds of the nests belonged to GBBG. Eggs in Area B were punctured to suppress productivity. GBBG and HERG nesting in areas A and B were censused for a second time on 17 June. There were no gulls nesting in area A. In area B, 13 new GBBG nests and 36 new HERG nests were counted. All the eggs were punctured. In general, gulls were present in the colony more this season than in past years. The majority of the gulls came into the colony late June through early August. HERG were seen in the colony a minimum of 3 times and GBBG were seen in the colony at least 61 times. At least 28 COTE chicks were taken. One GBBG was removed from the colony this season.

**NORTHERN HARRIER:** At least one pair of Northern Harrier nested on South Monomoy Island. The nest was not found but the adults exhibited nesting behavior. NOHA were seen in the tern colony a minimum of 24 times during the season. At least 5 adult terns found dead in the colony were likely killed by NOHA. There were no recorded observations of chicks taken.

**GREAT HORNED OWL:** A Great Horned Owl was present in an area of the colony near the field camp during the nights of 17-20 July, causing nocturnal abandonment from 17-25 July. Six COTE adults, 1 COTE fledgling, 4 COTE chicks, and 1 LAGU adult were killed during GHOW visits. Triangular signs were used around the colony to prevent perching.

**COYOTE:** A total of six adult coyotes were removed this season: 2 in April, 2 in May, 1 in June, and 1 in July. Coyotes, sometimes in pairs, were seen in the colony on six nights and once during the day. Evidence of coyote (tracks or scat) was found in or around the colony a minimum of 23 times throughout the season. There was some evidence of depredation.

**BCNH:** Black-crowned Night-heron were first seen in the colony 28 May, and were present during most nights in June and July. BCNH were seen taking eggs and chicks. A total of 4 BCNH (3 adults and 1 juvenile) were removed from the colony.

**LAGU:** Kleptoparasitism continued this year with increased numbers of nesting LAGU. Results from the 61 hour-long stints conducted this season were consistent with observations from 2002, though rate of kleptoparasitic attempts increased from 10.2 attempts per hour-long stint in 2002 to 13.7 attempts per stint in 2003. More than 836 kleptoparasitic attempts were observed and recorded this season. LAGU were successful in 44% of the attempts, COTE were successful 29% of the time, the victor was unclear or undetermined 14% of the time and a dropped fish resulted in about 12% of the attempts.

#### VEGETATION PLOTS

Two experimental vegetation control plots were established in 2001 in an attempt to create a larger area of suitable nesting habitat for terns and to control the area used by nesting LAGU. In 2002, vegetation control continued with the addition of 4 plots. This season data was collected from all previously established plots. The treatments and corresponding numbers of nesting COTE and LAGU (during the A-census window) are listed below:

<u>Plots-Treatment, Season Established, Size</u>	<u># COTE</u>	<u># LAGU</u>
Control (no treatment) 30 x 30 meter plot	0	19
Hand-pulled (spring 2001) 15 x 30 meter area	14	1
Landscape cloth (spring 2001) 15 x 30 meter area	4	28
Spray (fall 2001) and Rake (spring 2002) 30 x 30 meter area	13	65
Spray (fall 2001) and Burn (spring 2002) 30 x 30 meter area	33	7

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Burn only (spring 2002) 30 x 30 meter area	11	6
Rake only (spring 2002) 30 x 30 meter area	0	48

Productivity in these vegetation plots was low due primarily to BCNH predation.

## **Part 2: New Business**

### **Oil Spill Clean-up and Tern Management on Islands in Buzzards Bay, 2003**

Carolyn S. Mostello, Massachusetts Division of Fisheries and Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581, (508) 792-7270 x. 312, [carolyn.mostello@state.ma.us](mailto:carolyn.mostello@state.ma.us)

On 27 April 2003, Bouchard Barge No. 120 spilled an estimated 98,000 gal of no. 6 fuel oil into Buzzards Bay, MA. Three important Roseate and Common Tern nesting islands were oiled to different degrees: Bird I. (light); Penikese I. (light to moderate); and Ram I. (heavy). At 1-acre Ram I., over 20 birds (including shorebirds, seabirds, and waterfowl) were found dead immediately after the island was oiled, and many other individuals, including terns, were oiled to varying extents. To limit further oiling of terns and their eggs on Ram I., terns were hazed using a variety of techniques from 3 to 30 May during the emergency response phase of clean-up. At the same time, habitat was modified on Penikese and Bird Is. through the addition of nestboxes and plywood boards, which served both to enhance Roseate habitat and exclude Common Terns from prime Roseate habitat. A social attraction system for terns was also operated on Penikese I. Clean-up on Ram I. included removal of oiled wrack and dead oiled marsh grass; scraping and removal of oiled substrate; and scrubbing and power-washing rocks. Some marsh was restored. On Ram I., terns began nesting about 10 d later than in 2002. As compared to 2002, Common and Roseate Tern numbers increased on Bird and Penikese Is. and decreased on Ram I.; numbers for both species were up for the three islands combined (+17% for Roseates, +10% for Commons). Notably, Roseates nested in substantial numbers (251 pairs) at Penikese, where they had not nested since 1997. Known-age Roseates (n=194) nesting on Penikese were originally banded primarily at Bird I. (64%), Ram I. (20%), and Great Gull I. (NY) (11%); mean age of these individuals was 6.7 yr (range, 2-20 yr). An oil spill damage assessment study for terns was initiated in 2003; this study focused on interisland comparisons of hatching success (both species), early chick growth (Roseates), and adult survival (Roseates).

#### **Looking for observations of banded Oystercatchers:**

Biologist Brad Winn from the Georgia Department of Natural Resources is looking for information on color banded oystercatchers. Brad can be reached at 912-262-3336

## **Waterbird Conservation for the Americas**

Mid-Atlantic/New England/Maritimes Regional Working Group, Scott Johnston,  
USFWS

**What is Waterbird Conservation for the Americas?** Waterbird Conservation for the Americas is an international initiative that seeks to ensure that the distribution, diversity, and abundance of populations and habitats of breeding, migratory, and non-breeding waterbirds are sustained throughout the terrestrial, wetland and marine ecosystems where they occur in North America, Central America, and the Caribbean. Species include the loons, grebes, albatrosses, shearwaters, petrels, storm-petrels, tropicbirds, boobies, pelicans, cormorants, frigatebirds, herons, egrets, bitterns, ibises, storks, rails, cranes, gulls, terns, skuas, jaegers, auks, murre, puffins, murrelets and guillemots. The initiative is a partnership of national and local governments, non-governmental conservation organizations, scientists, wildlife managers and private businesses and individuals working toward waterbird and habitat conservation.

**What is the Mid-Atlantic/New England/Maritimes Regional Working Group?** The MANEM Working Group is a regional partnership of organizations and individuals working to facilitate waterbird conservation in 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). Together these biologically-based spatial units make up the MANEM region.

**How does the MANEM Working Group facilitate waterbird conservation?** The working group hopes to help local resource managers within the region protect waterbirds and their habitats by facilitating the development and distribution of information on the status and conservation needs of waterbirds and habitats, and by building partnerships between wildlife managers, scientists, conservationists and supporters.

### **What are some of the specific goals of the MANEM Working Group?**

1. To facilitate the identification and assessment of regional waterbird and habitat resources.
2. To link waterbird conservation efforts throughout the region to assist information sharing.
3. To link regional efforts with the larger-scale conservation projects of the Waterbird Conservation for the Americas initiative.
4. To secure support for conservation projects within the region.
5. To develop and/or distribute technical information on management practices that promote waterbird sustainability, such as disturbance and predator management at colony-sites, monitoring protocols, and restoration techniques.
6. To facilitate the integration of waterbird conservation with other management objectives of local wildlife professionals, for example, meeting the goals of all-bird conservation within the region.

Some of the products of the working group will be:

1. An active network of wildlife managers, scientists, conservationists, policy makers and supporters that together will achieve a vision of waterbird and habitat conservation for the Mid-Atlantic/New England/Maritimes region.
2. A plan that identifies regional waterbird and habitat resources, assesses their status and conservation needs, and provides recommendations for achieving conservation goals.
3. A website to facilitate the work of the network and the sharing of information (<http://birds.fws.gov/regionalplanninginternal/MANEM/>).

**How can I participate and benefit from the MANEM Working Group?** The effort is currently being led by Scott Johnston at USFWS ([Scott.Johnston@fws.gov](mailto:Scott.Johnston@fws.gov)) and Kathy Parsons at Manomet Center for Conservation Sciences ([parsonsk@manomet.org](mailto:parsonsk@manomet.org)).

### **Part 3: Research Review Presentations**

**CHICK SURVIVAL AND FLEDGLING RESIDENCY FOR LEAST TERNS IN MAINE** - *Jordan Perkins and Dr. Frederick Servello, University of Maine, Dept. of Wildlife Ecology, 5755 Nutting Hall, Orono, ME 04469 phone:207-581-2939 (jordan\_perkins@umit.maine.edu)*

Least Terns are state listed as endangered in Maine and there is a need for additional information on breeding success and behavior. We documented chick survival and fledgling residency at Maine's largest Least Tern colonies in 2002 and 2003. We banded 103 chicks in 2002, and >110 chicks were banded in 2003 with unique combinations of 13 band colors. We searched beaches for banded chicks with spotting scopes every 1-3 days until all had dispersed. We assumed that chicks 21 days old had fledged. In 2002, we observed 71 banded fledglings at least once; therefore, the minimum survival from hatch to fledging was 69%. Of the fledged individuals, 28% were resighted at least three weeks post-fledging. The mean interval between fledging and departure from the colony was 16 days  $\pm$  8.9 (SE). Chicks that fledged by mid-late July remained in the colony up to 25-30 days, whereas those fledging  $\geq$  late July remained for approximately 15 days. In 2003, we have banded 115 chicks; data collection for survival and fledgling departure rates are in progress. In conclusion, chick survival was high and departure rates exhibited temporal patterns in the first year of the study. This information will help to understand breeding success patterns in Maine, and to design productivity surveys for Least Terns.

**PREDATION RATE AND PREDATORY BEHAVIOR OF LARGE GULLS ON EASTERN EGG ROCK, ME**- *Christina Donehower, McGill University, Dept. Natural Resource Sciences, Macdonald Campus, 21,111 Lakeshore RD, Ste-Anne-de-Bellevue, QC H9X 3V9 Canada (cdoneh@po-box.mcgill.ca)*

The impact of predation by Herring (*Larus argentatus*) and Great Black-backed (*L. marinus*) Gulls on the reproductive success of terns (*Sterna* spp.) nesting on Eastern Egg Rock, Maine was quantified between June 15 and August 2. During daily watches, I recorded depredation of tern eggs, chicks, and adults. In 160 hours of observation, I witnessed 97 successful predation events, 188 unsuccessful attempts, and 467 gull-initiated disturbances to the colony. These correspond to hourly rates of 0.606, 1.17, and 2.92, respectively. Despite the absence of predator control, tern productivity remained comparable to previous years.

The predatory behavior of gulls specializing on terns was also monitored. I identified a total of 11 'tern specialists' and recognized these individuals daily using unique color-marks and/or plumage characteristics. Age- and species- specific differences in hunting strategy were evident. With one exception, only adults preyed upon terns. Black-backs generally loafed on rocky ledges high above the intertidal zone and maintained feeding territories within the colony below. Herring Gulls were more opportunistic, however, often loafing and hunting in several localities. Herring Gulls were subordinate to black-backs of all ages and frequently lost kills to piracy. Several 'tern specialists' were also seen scavenging bait behind nearshore lobster boats.

**Comparing the breeding and feeding biology of sympatric nesting terns on Machias Seal Island, NB and Country Island, NS.** *Mathieu Charette and Dr. Tony Diamond, Atlantic Cooperative Wildlife Ecology Research Network, University of New-Brunswick*

Breeding sympatrically Common and Arctic Terns face the same weather conditions, habitats and predator pressures, suggesting that the factors responsible for differences in productivity are related to adult body condition and diet of the adults and the chicks. We are comparing diet between the two species on Machias Seal Island, NB, and Country Island, NS to get a better understanding of the factors influencing breeding success. There seems to be a trend that productivity is better for Common than Arctic Terns and better on Country Island than on Machias Seal Island. A combination of long-term tern provisioning data from 1995-2003, nutrient analysis of prey and use of stable isotopes taken from blood, eggs and feathers obtained in 2003 will be used to compare diets of chicks and adults. These will be compared to growth rates, adult body condition and breeding parameters such as clutch size, hatching success, lay date and productivity. Stable Isotopes will provide a better understanding of differences in adult diet, which is not obtained from traditional observation methods of prey deliveries to chicks.

**Birds Crossing Borders: Arctic Tern Population Update,** *Kate Devlin, Atlantic Cooperative Wildlife Ecology Research Network, University of New Brunswick*

Since 1999 we (ACWERN, Project Puffin, and the U.S. Fish and Wildlife Service) have been working together to closely examine the dynamics of the Arctic Terns nesting in the Gulf of Maine and the Bay of Fundy. Our efforts have been primarily focused on Machias Seal Island, Petit Manan Island, Matinicus Rock, and Seal Island NWR. For those of you on the islands this has meant trying to trap and band terns as well as reading tiny band numbers. While this project will continue to provide valuable information, especially as we have more birds of known ages in the population, all of our hard work is

starting to pay off. We now have the first estimates of survival and return rate for Arctic Terns in North America. We are also beginning to see how much movement there is by the terns among the different islands. I will be giving you a brief update on the data that has been collected so far and handing out this year's award for island band reading.

#### Overview of Wading Bird Research on Stratton Island: Hilary Walter

A wading bird study was initiated in 2002 on Stratton Island, Maine's most diverse avian sanctuary, located three miles from the Northeast's largest saltwater marsh. The primary objectives of this project is to establish a baseline of productivity for the Stratton Island wading bird colony, to investigate the influence of environmental factors, such as weather and tide, on the provisioning behavior of Glossy Ibis parents, to observe nestling interactions during feedings and while unattended by parents, and to determine changes in flight patterns due to weather and environmental factors. The 2003 field season found the study coming together and ending successfully. Over 200 hours of observations were conducted and after a successful field season it appears that the objectives will be easily met.