

Gulf of Maine Seabird Working Group (GOMSWG)
August 7, 2000
Hog Island, Bremen, Maine

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Welcome – Steve Kress National Audubon Society

Tern populations have increased in most years since 1984 (when regional counts began), but the 2000 tern nesting season in the Gulf of Maine (GOM) saw stable populations of Common and Roseate Terns and a decline of Arctic Terns. Common Terns, remained stable at 17,876 in 2000, comparable to the 17,823 pairs in 1999. Likewise, GOM Roseate Terns remained remarkably constant with an increase of just 1 pair- from 376 pairs in 1999 to 377 pairs in 2000. Arctic Terns declined by 14% to 4,524 pairs in 2000 from 5,244 pairs. In contrast, Least Terns increased by 18% in 2000 to 1,294 pairs from 1,096 pairs in 1999. The most dramatic change this year is the number of nesting Laughing Gulls. In the last two years, Laughing Gulls have pioneered two new colonies among large tern colonies- Jenny Island (ME) and Machias Seal Island (NB). In just one year, Laughing Gulls increased by 28% from 2,494 to 3,196 pairs. Much of this increase occurred at Eastern Egg Rock (ME) which experienced a 47% increase since 1999 to 966 pairs.

Although the GOM Common Tern population was stable, there were some dramatic shifts within the region. By far the largest increase occurred at South Monomoy Island (MA)- the largest colony in the GOM where Common Terns increased by 25% to 6,886 pairs. The colony now supports 39% of the Common Terns in the GOM. The restoration project on Seavy Island also showed a dramatic increase of 298% from 80 pairs in 1999 to 318 pairs this summer. Mysteriously, all of the 558 pairs of Common Terns which nested on Ship Island (ME) Maine in 1999 abandoned in 2000. Roseate Terns increased at North Brother (NS) to 89 pairs, offsetting continued declines at Petit Manan (ME), while Roseate Terns at Eastern Egg Rock (ME) and Stratton Island (ME) continued slow growth as the first and second largest colonies in the GOM.

Note: As a result of discussions during the August 1999 Gulf of Maine Seabird Working Group (GOMSWG) meeting, the format of the summer meeting has been changed to allow time for presentations on research and discussion of issues affecting seabirds in the Gulf of Maine. A large flip chart listing pertinent census numbers for each presenter was prepared ahead of time to allow the audience to see rather than hear census numbers. Using this format, all island reports were presented before the lunch break leaving the afternoon session for discussion of research and management issues.

All presenters were asked to provide a written report for inclusion in the official minutes which would include numbers and details that are better read in print. These unedited reports follow.

We extend thanks to Bob Houston of the USFWS Gulf of Maine Project for preparing a map of Gulf of Maine seabird nesting islands. The map stretched enabled each presenter to point to the island under discussion. We also thank Dale Tyson of the National Audubon Society for preparing the flip chart.

Part 1 - CENSUS REPORTS

Canada – Andrew Boyne, Canadian Wildlife Service

OUTSIDE THE GULF OF MAINE

Country Island

It was estimated that there were 90 pairs of Herring and 20 pairs of Great Black-backed Gulls nesting on Country Island before restoration. Since that time there hasn't been a single successful gull nest on the island. We destroyed 23 gull nests in Year 1 (1998), 9 nests in Year 2 (1999), and 3 nests in Year 3 (2000). The maximum number of gulls observed on the island at one time decreased in the three years of the project from about 140 in 1998, and about 20 in both 1999 and 2000.

Table 1: Numbers of nesting terns on Country Island, NS

Year	Arctic	Common	Roseate	Total
1996	330	130	45	505
1997	170	50	1	221
1998	217	120	3	340
1999	376	167	16	549
2000	569	335	53	957

GULF OF MAINE ISLANDS

The Brothers - Summary reports from Ted D'Eon's web page

<http://fox.nstn.ca/~deonted/tern00.html>

June 10, 2000 - The primary tern nest count on N. Brother was conducted with the help of the Nova Scotia Bird Society's president, Gisèle d'Entremont, my son, Nigel, and Jerome D'Eon's children, Rachel and Benjamin. The total number of nests was greater than I expected at 491. This included 89 nests with single egg, 246 containing 2 eggs, 100 containing 3 eggs, PLUS 56 Roseate Tern nests.

Normally at this time of the year, less than 2/3 of the Roseates have laid. A Roseate Tern nest count about two weeks later usually almost doubles the number of nests! About 3 or 4 adult terns had been eaten by some predator; only wings and feathers remaining. Two more dead adults may have died of more natural causes. Some of the Arctic Tern nests seen on May 30, on the northern beach rocks, were not there anymore.

There were a small number of terns on S. Brother. I will check these out at a later date.

We counted 11 Arctic Tern nests on Flat Island; one containing 1 egg, 5 containing 2 eggs and 5 nests containing 3 eggs. There was a pair of Green-wing Teals at Flat I., one Puffin at Mud I., and about 40 Puffins at Noddy I. I am concerned with the lack of Eider ducklings in the Lobster Bay area of Southwest Nova Scotia. With the estimated 300 or so Common Eider nests on the Mud Island group of islands, we saw only two broods of ducklings; there were 2 or 3 ducklings in one and 4 or 5 in the other! Are the gulls cleaning them up? I know the nests have not all hatched yet, but we should have seen hundreds of ducklings on this visit.

Table: The numbers of nesting pairs of terns on N and S Brother Island, Lobster Bay, NS 1990-2000.

Date	N. Brother	S. Brother	ROST census date	Roseate	Total
June 7, 1990	302	28	June 1990	?	330
June 11, 1991	441	13	June 23, 1991	20	474
June 11, 1992	413	0	June 18, 1992	23	436
June 9, 1993	367	0	June 20, 1993	30	397
June 8, 1994	380	0	July 12, 1994	34	414
June 14, 1995	457	0	June 22, 1995	33	490
June 16, 1996	554	12	June 28, 1996	48	614
June 12, 1997	630	120	June 25, 1997	54	804
June 11, 1998	452	151	July 3, 1998	59	662
June 7, 1999	372	0	July 9, 1999	61	433
June 10, 2000	491	0	June 24, 2000	86	577

Machias Seal Island - Kate Devlin, Chantal Gagnon, and Dedreic Grecian, ACWERN, Department of Biology, University of New Brunswick.

This year the field crew arrived on the island on May 11. The birds arrived and began nesting no later than usual this year. The peak for puffin egg laying was between 7-13 May (calculated by back dating from hatching dates). The peak for Razorbill egg laying was between 17-24 May. The first tern nest was found on May 29, peak Arctic Tern laying was June 5 and peak Common Tern laying was June 8. Average productivity for each species is summarized in Table 1.

The ACWERN research crew, 4 CWS employees and 2 lighthouse keepers conducted an island wide tern nest count on 13-14 June. The corrected total was 2662 nests. The species ratio was determined by the identification of 1352 nests which yielded 31% Common Terns, 69% Arctic Terns. Nesting Common Terns have been gradually increasing on the island and the numbers of nesting Arctic Terns have been decreasing over the last six years (Table 2).

Control of Herring and Great Black-backed Gulls was limited this year. Because of legalities, the CWS warden was not issued a gun this year. Therefore, there was more of a presence of larger gulls on the island than in years past. On 8 June a few Herring and Great Black-backed Gulls destroyed many tern nests on the northern end of the island. Researchers and the warden scared off the gulls, however, the damage was done before we could reach that end of the island. Gulls continued to patrol the island throughout the season. After the official tern nest count there were re-nesting attempts by terns. A second count, conducted on 6 July, of a sample area of the north end of the island revealed 187 nests where only 22 had been counted during the official count window. Our estimation of tern productivity includes 10 late Arctic tern nests, which appeared in a study plot that had been completely decimated (16 nests destroyed).

The presence of the gulls (as well as a pair of ravens and a Gyrfalcon which visited the island early in the season) also had an impact on the alcids nesting on the island. Several puffin and Razorbill eggs were found cracked open and grubbed from burrows (presumably the work of either gulls or ravens). On 5 July one Herring Gull nest with 2 eggs was destroyed. The warden also used noisemakers to scare off the gulls during the season.

Productivity for all species monitored was low this year (Table 1). The causes for the low productivity may be a result of the presence of predators and the prey items that were fed the young (Table 3). Both Arctic Terns and Puffins fed on euphausiid shrimp more this year than has been observed in the past (Bernard *et al.* 1999. *MSI Season Report*). This is generally not considered as high a quality of food item as a fish such as herring. The Razorbills were observed feeding on more herring than the other species. A number of tern chicks and puffin chicks were found dead near nest sites. There was evidence of starvation. The size and weights of fledgling Arctic Terns and Puffins is lower this year than other

years and is also an indication of poor food quality (this will be discussed further in the season report). The numbers of Puffin fledglings coming to the lighthouse has been low as of 6 August, however, it is our impression that the fledglings have been delayed and will be fledgling at a later age than usual.

On another note, on June 24 we discovered a single Laughing Gull nest on the island with 2 eggs. The chicks hatched on July 19 (it's possible that the chicks hatched 1-2 days prior to discovery). As of 6 August at least 1 chick was still alive and the adults were still attending the nest. This marks the northern (and eastern) most pair of breeding Laughing Gulls that we are currently aware of.

Table 1: Seabird productivity for Machias Seal Island in 2000.

	ARTE	COTE	ATPU	RAZO
# nests	87	34	75	66
mean Clutch (SD)	1.6 (0.52)	1.7 (0.62)	1	1
mean Hatchlings/Nest (SD)	0.9 (0.87)	1.2 (0.92)	0.8 (0.41)	0.7 (0.44)
mean Fledglings/Nest (SD)	0.4 (0.52)	0.6 (0.50)	0.5 (0.50)	0.6 (0.49)

Table 2: Tern census counts and species ratio for Machias Seal Island 1994, 1996, 1998, 2000 (data from Newell 1994, Newell 1996, Newell and Mackinnon 1998, Boyne et al. 2000).

Year	Corrected Total	Species Ratio	
		% Common Terns	% Arctic Terns
1994	2787	*13.2 % (368)	*86.8 % (2429)
1996	2245	27.1 % (608)	72.9 % (1637)
1998	3272	30 % (982)	70 % (2290)
2000	2662	31 % (825)	69 % (1827)

* Ratio has been corrected after examination of the points where the species ratios were examined (Diamond 1999).

Table 3: Observed prey items delivered to nests on Machias Seal Island in 2000.

	ARTE	COTE	ATPU	RAZO
Hours of Observation	127	81	78.9	42
Approximate Nest Hours	351	330	*710	*378
Identified items / Total	241 / 266	179 / 184	1736 / 1957	535 / 543
Herring	47.7 %	82.7 %	46.4 %	81.3 %
Hake / Rockling	12 %	8.9 %	27.3 %	10.8 %
Euphausid	35.7 %	1.1 %	15.4 %	0 %
Butterfish	1.7 %	0.6 %	0.2 %	0 %
Sandlance	1.7 %	0.6 %	9.9 %	7.7 %
Pollock	0.4 %	4.5 %	0.6 %	0.2 %
Other	0.8 %	1.7 %	0.1 %	0 %

*assumes 9 burrows per observation site

Please note: A more extensive season report will be available on the internet, contact K. Devlin (i65v9@unb.ca) or Laurel Bernard (bernardl@unb.ca) for more information.

Petit Manan Island – Rachel Page, Petit Manan NWR, USFWS

Census

The census was conducted on June 20 and 21, 2000. The total count for tern nests was 1342, with a Lincoln Index corrected value of 1436. This is 52 fewer nests than the 1999 count, a decrease of 3.5%.

The species ratio of Arctic (ARTE) to Common (COTE) Terns was estimated by identifying 318 nests to species from two vantage points, the lighthouse tower and the second story windows of the boathouse. We identified 105 ARTE and 213 COTE nests, resulting in a species ratio of 33% ARTE and 67% COTE. This ratio of ARTE to COTE is similar to the ratio in 1999: 39% ARTE, 67% COTE; and up from the ratio in 1998, 23% ARTE, 67% COTE.

In addition, Common Eiders (COEI) and Laughing Gulls (LAGU) were censused. Corrected totals were 127 COEI nests (a 7.8% increase from 1999) and 794 LAGU nests (a 20% increase from 1999, and a 33% increase from 1998).

We identified 16 Roseate Tern (ROST) nests by direct count, 15 of which were present at the time of census. This is a 43% decrease from 28 nests in 1999, and a 16% decrease from 19 nests in 1998.

Tern Timetable

Species	1 st EGG	1 st CHICK
COTE	May 27	June 18
ARTE	May 27	June 17
ROST	June 1	June 21

Tern Productivity

Values for COTE and ARTE were determined from fenced productivity plots and from nests we followed for provisioning studies. All ROST nests were followed for breeding success.

	COTE (n=29)	ARTE (n=60)	ROST (n=16)
mean clutch size	2.24 ± 0.58	1.85 ± 0.36	1.63 ± 0.5
mean hatch/nest	0.86 ± 0.30	0.62 ± 0.46	0.75 ± 0.37
mean fledge/nest	1.17 ± 0.76	0.62 ± 0.64	1.00 ± 0.63
reproductive success	55.7%	30.8%	65.6%

Mean fledge/nest rates were slightly up from last year's values for all three species of tern. Average reproductive success was similar to percentages from 1999 (COTE 55.6%, ARTE 29.5%, and ROST 71.4%). Mean hatch/nest and mean clutch size were also similar to 1999 values.

Four ROST chicks died after the 5 day fledge date. Including these chicks in our totals results in an adjusted reproductive success of 53.1% and an adjusted mean fledge/nest value of 0.75 ± 0.45.

Breeding success for ARTE differed significantly per productivity plot. ARTE had much higher reproductive success rates in plots that were well established with a high density of COTE and ARTE nesting together. Nests in newly settled areas and nests in close proximity to LAGU nests did poorly.

Highlights from Feeding Study

	COTE		ARTE	
	% of total	mean length	% of total	mean length
herring	57.8%	1.62 ± 0.41	43.0%	1.45 ± 0.51
hake	23.9%	1.54 ± 0.57	39.5%	1.36 ± 0.52
Pollack	12.1%	2.11 ± 0.38	3.5%	1.56 ± 0.31
invertebrate	3.5%	0.33 ± 0.12	7.0%	0.28 ± 0.90
stickleback	2.4%	0.96 ± 0.17	4.4%	0.85 ± 0.14
butterfish	0.3%	1.50 ± 0.00	2.6%	1.42 ± 0.14

ARTE Banding

As a part of the ARTE Metapopulation study, we placed field readable bands 123 adult ARTE terns and 64 ARTE chicks.

Vegetation Control and Nesting Distribution

As a result of a controlled burn and herbicide applications, the amount of available nesting area increased significantly this year. The intent was to open new nesting grounds for terns. However, we instead observed expanded LAGU nesting. The terns were pushed to the extreme edges of the island and were highly concentrated along the eastern berm-vegetation edge. Terns that did nest in the newly opened areas had extremely low productivity; their nests suffered almost total gull depredation.

LAGU Predation

We observed LAGU take four tern chicks and one tern egg. Because the terns usually did not respond to LAGU predation with coordinated mobbing behavior, we suspect much higher LAGU predation than we observed.

We conducted daily 2-hour observations of LAGU-tern interactions from July 10 to the end of the season. We observed attempts at kleptoparasitism on every day of observation but two.

Great Black-backed Gull (GBBG) and Herring Gull (HERG) Predation

We shot one HERG (June 15), and destroyed one HERG nest on PMI (May 31). Numbers of gulls loafing in the intertidal area, especially on the southwest point of the island, decreased as the season progressed. This may be due to our increased presence in the colony as the season progressed.

Gull predation was heaviest in the northwest end of the island (a burn area). We repeatedly observed gulls preying upon nests in this area, and counted approximately 130 depredated nests, the majority of which were ARTE.

Alcids

High counts for the season are as follows: Atlantic Puffin (ATPU): 140 (June 25); Black Guillemot (BLGU): 450 (May 28); and Razorbill Auk (RAZO): 37 (June 8).

We banded 66 BLGU chicks, 6 BLGU adults, and counted 76 active burrows. We banded 4 ATPU chicks, 3 ATPU adults, and counted 17 active burrows. No RAZO nested on PMI, although we observed both courtship and copulation.

Common Eiders

The first Common Eider (COEI) crèches were observed at PMI on June 10. Daily we documented the number and composition of crèches, as well as nasal marked hens and their role in each crèche. High count for the season was on July 8: 239 ducklings in 38 crèches. COEI ducklings were frequently preyed upon by GBBG and Bald Eagles. We observed one HERG depredation of ducklings.

Peregrine Falcon Predation

The peregrine falcon (PEFA) visited almost daily throughout June and early July. We observed the PEFA take 1 adult ATPU, 6 adult terns, and 1 adult LAGU. This degree of predation is slightly higher, but similar, to predation seen in previous years.

Ship Island – Dale Dixon, USFWS, Petit Manan NWR

During the 1999 season, Ship Island supported a colony of 558 pairs of Common Terns. However, the 2000 season would not turn out to be a successful year for Ship Island. The research crew established camp on May 19th, and they observed terns in the vicinity of Ship Island. Terns continued to visit the island daily, with a high count of 180 individuals observed on June 2nd. The first nest was also observed on June 2nd. Although a total of 35 nests were identified during the season, adults were only observed incubating on two occasions. All other eggs appeared to be abandoned shortly after laying. During the first several weeks of the season, terns continued to visit the island, but never stayed beyond mid-afternoon. By the 11th of June, tern activity had dropped to nearly zero, with 5-15 terns being observed in the vicinity of the island on a daily basis. No additional nesting behavior was recorded throughout the season.

We were not able to establish the reason for the abandonment of the Ship Island colony. It is not believed that predation was a factor, given the only observed predation was a single peregrine falcon visit (6/9/00). The 35 abandoned nests with eggs remained intact until June 30th, when crows were observed preying on several nests.

Although terns did not nest on Ship Island this year, it appears they did return to this portion of the Maine coast. GOMSWG surveys conducted in the vicinity of Blue Hill Bay by John Drury and PMNWR indicate approximately 500 pairs of common terns nested on four different islands in the Bay. In addition, 250 Common Terns were observed staging on Ship Island on August 4th.

Eastern Penobscot Bay – Brad Allen, Maine Dept of Inland Fisheries & Wildlife

On June 13, Andy Weik, John Kenney and I censused ten islands in East Penobscot Bay and found evidence of nesting on four islands. In 2000, no terns nested on East and West Grass Ledges, Colthead Island, Pond Island, Dagger Island, and Thrumcap Island. Nest counts were conducted on Hardhead Island where 43 COTE nests were recorded and Eaton Island Ledge where 32 COTE nests were censused. In addition, one pair of terns was recorded on both Buck and Spectacle Islands. On July 11, Lindsay Tudor, Brian Benedict and I observed (from the boat) the presence of fledglings on both Hardhead and Eaton Island Ledge. Also observed on and around Hardhead Island two immature Bald Eagles apparently hunting young gulls. We observed one successful predation event.

*Metinic Island to Frenchboro Long Island, South of North Haven and Stonington -
John Drury*

These observations were supported by a grant from the Maine Department of Inland Fisheries and Wildlife.

Great Spoon:

June 5 11:10 15 Adult Common Tern over the nesting area on the spit,
June 18 09:20, 2 arctic terns appear at the SE beach, but sail off to the east as if unattached. There used to be a few pairs of Arctic terns that bred on this beach.
0 terns at the spit the small group that was here June 5th has moved.
2 Oystercatchers flush off the spit calling; they sail off to the east.

Little Green:

June 15 10:20, 6 ad Arctic terns west of the landing, four nests with two eggs found, and one broken egg.
Eastern beach, ~40 adult terns total.
In large rocks just N of the beach, 4 nests with two eggs found.
Along the N end of the beach, 3 nests with one egg, 14 nests with two eggs, one nest with three eggs.
Southern part of the beach, 9 nests with one egg, 18 nests with two eggs, 7 nests with three eggs,
~3 out of 4 Arctic terns on the east beach.

Total: 60 nests estimate ~ 45 arctic and 15 Common

July 19, 09:10, 2 fledgers seen from the boat at the North end of the eastern beach. Two adult 0 fledglings seen west of the landing. 12 adult and 3 fledglings, N end of the beach from the shore. A total of 11 fledglings seen and 1 large chick, as well as feedings at sites in the vegetation where the chick was not visible at the northern end of the beach. 30 adult over the site of the largest concentration of nests at the southern end of the beach. 5 fledglings seen as well as a few feedings in the deep veg. Total: ~45 adult attending the island, 16 fledglings seen in ½ hour visit, as well as a few large chicks and feedings at sites in the veg. The terns did quite well on little Green this year.

Hog Island (Metinic):

June 15 13:00, 35-40 adult on the Metinic-facing beach, We found, 4 nests with one egg, 19 nests with 2 eggs, 12 nests with 3 eggs, one poked egg, one broken egg and a nest with 2 eggs broken, and two eggs dumped. East side: 2 nests each with two eggs. **Total 37 nests: ~55% Common and 45 % Arctic.**

July 19, 11:00, 12 adult Arctic, on the western shore, no sign of fledglings. The colony here has apparently failed to fledge any young this year at least on their first attempt there may be nests with viable second clutches.

Metinic (Southern end):

June 15, Western shore just North of the narrows, 12 adult Arctic terns, 2 nests with one egg, 3 nests with two eggs, 1 nest with three eggs, no adult common seen in this group. West of the houses, 6 adult arctic attending, 1 nest with one egg, and 4 nests with 2 eggs 70 meters along the shore: 12 adults, (mostly arctic) 10 nests with 2 eggs, 2 nests with 3 eggs. SW corner one nest with three eggs arctic terns attending, along the SW shoreline, ~25 adult terns (mixed arctic and common) First group: 2 nests with 2 eggs, 3 nests with 3 eggs. Second group: 3 nests with 1 egg, 9 nests with two eggs, 2 nests with 3 eggs. East side of the southern tip: 12 adults (mixed arctic and common), 2 nests with 2 eggs, and 3 nests with three eggs. No terns over the Hog Island facing beach, from there I saw a black-back in the colony on Hog Island--apparently foraging and being fiercely attacked by the terns. **Total: 48 tern nests found on the southern end of Metinic. Estimate: ~30 arctic and ~18 common.**

The total number of Terns nesting on the southern Metinic and Hog Island was 85 down from 108 in 1999. The loss apparently coming mostly from the Arctics ~70 in 1999 and ~50 in 2000, though these species ratios are based on estimates made by identifying adults overhead during one or two visits.

July 19: 12 adult mostly common terns, 3 seen settling apparently on eggs. I passed through the area and found one broken egg and two nests each with two eggs. 0 terns SW shore near the tip, the last two nesting clumps on the SW shore. 6 adult terns seen on the Southwestern shore from the boat. The ~50 pairs of terns that nested on the southern end of Metinic have done very poorly this year, I may have overlooked a couple of fledglings but there were very few adults attending any of the former nesting areas.

Eastern Cow Pen:

June 18, 10:14 15 terns roosting on the shore, ~55 terns fly off the island, ~40 up out of the nest area. We found: 8 nests with one egg, 12 nests with two eggs, 25 nests with 3 eggs, and 1 nest with four eggs. There were no gull nests on the island.

Total: 46 nests (COTE).

July 6, 11:24 ~60 common Terns come out of the nest area.

July 21, 10:00 75 adult roosting on the shoreline, ~220 adult common terns total bringing in fish. 19 large chicks seen from shore, 5 seen flying a few of these were from the top of the island in the drift wood and cobble crown. 2 large chicks were seen out on the open beach well away from any cover.

Herring, Pollack? Hake, butter fish. Several adults apparently on eggs.

The terns here are doing quite well.

Three Bush Island:

June 5, 13:14 ~140 adult Common Terns. I checked the nesting area and found 5 nests with one egg and 5 nests with 2 eggs. There were few nests with eggs, many scrapes.

June 18, 14:30 400-450 Common terns.

Nest count eastern shore to the southern tip: 19 nests with one egg, 40 nests with two eggs, 24 nests with three eggs, 3 nests with 4 eggs. Total: 86 nests.

Nest count from the southern tip around the western shore: 25 nests with one egg, 76 nests with two eggs, 52 nests with three eggs. Total 153.

Total: 239 nests (COTE).

There was one herring gull nest with two eggs in the vegetation near the southern tip, and a second on the North in a gap in the tern nests. These gull territories probably caused the gaps in the tern colony.

There was a pile of tern feathers where an adult had been butchered near the southern tip and a fresh Great Horned Owl feather was found on the western shore.

I believe that the colony is still growing judging from the proportion of estimated adults to nests found.

July 6, 1:55 ~300 terns. The colony is still present and vigorous.

July 21, 11:30 ~60 adults roosting on the shore, ~150 adult seen as we go ashore. We made a search of the shoreline, not intending to find every nest but just to determine what was going on. We found: 14 nests with one egg, 37 nests with two eggs, 11 nests with three eggs, 1 nest with a chick just hatching and an egg, 3 nests with one dead tiny chick and 3 nests with two dead tiny chicks.

There was a very hard rain the night of the 18th maybe that helped kill the tiny chicks. It did not kill the large chicks at the eastern cow pen.

The first batch of tern nests here clearly was a total loss. The eggs found were probably laid near the time of the nest count on June 18, or afterward (if the incubation was not extended by periodic abandonment.)

August 22, 1 tern flies over. No sign of late success.

Dry Money Ledge:

June 18 ~130 adult Common Terns: 7 nests with one egg, 34 nests with two eggs, 31 nests with three eggs. The small area of beach pea was saturated with nests; there were two clutches on the beach beyond the cover without any nest at all.

Total: 72 nests (COTE).

July 6, 12:33 ~200 terns very dense in the nest area and 90 adults roosting on the shore

July 21, 13:35 ~200 adult common terns, 5 large young seen from the dory. Good cover of beach pea makes it hard to see chicks, fish coming in. This is a vigorous flock. Good success.

Wooden Ball:

June 19, 5 adult Arctic Terns (2 above the old nest area in the middle of the NW shore, three South west of the beach). We found no nests in the old nest area though there were adults attending with fish. We found two nests each with two eggs above the SW end of the beach in the middle of the NW shore.

Total: 2 nests (ARTE)

July 20, 6 adult arctic Terns around no sign of chicks, Drifted in the cove for 10 minutes.

August 1, 12:30 3 adult Arctic terns on the shoreline below the beach near where the terns where nesting. No sign of fledglings.

Shore Bird Ledge (Seal Bay, Vinalhaven, near Burnt Island):

June 20, One common tern nest with three eggs. Adult did not flush until I was up on the island near the vegetation, this result shakes our confidence in some of the other Zeros.

Total: 1 nest (COTE)

July 23, Feeding seen in tall grass, small chick and just hatching egg found there. The first clutch must have failed. Observers: Gid Loring, Terry Goodhue, and Wooly Hildreth.

Islands at which no terns were seen:

Zeros were collected by approaching the island and scaring gulls into alarm--counting on the gulls to raise any terns. There were no gulls on some of the ledges checked and the gulls were not always very alarmed. There were no gulls on Shorebird Ledge in Seal Bay, Vinalhaven. The tern did not flush until I was ashore. This shook our confidence in some of the other zeros, and so I qualify these by saying that at these islands no terns were seen. Lone pairs could be overlooked easily.

June 15, 09:50 Large Green, Little Two Bush

June 18 Little Spoon, Black Horse or White Horse, Western Cow pen, Spirit Ledge, Mason Ledge, Heron Island, Western Shore, Brimstone, Gooseberry, Green Island, Harbor Island Knob (Burnt coat), John's Island, Ram Island (east side of Swan's), Crow Island (mackerel cove swans), Ledge west of crow island, Egg Rock (Jericho bay) Halibut Rocks, Saddleback, Southern Mark, Southern Poplestone, Green Ledge (Fog Island)

June 19 Ledge inside Brig Ledge Criehaven, Green Ledge, Camp Cove Ledge, Shag ledge, Pudding Is., Ten Pound Is., Two Bush, No Man's Land, Deadman's Ledge, Jamus and Willies Ledge.

June 20 Little Hurricane, Ledges N and East of Little Hurricane (good looking tern island with a bit of vegetation on top), Black ledge (off big garden), Medric Rock, Green Ledge, Green Island, Dogfish Island Knob, Sugarloaves, Dumplings. No terns seen up in Mill River, Goose Rocks Island, Knob at the southern end of Calderwood, The Babbage Island Ledges, ledges N of Penobscot Island (Seal Bay), Smith island, Duck Islands (near Smith), Green Island (east side VH), Green Ledge (east side VH).

July 6 Moore's Harbor Knob (2 terns in the harbor, but none on the Knob)

July 22 Norton Island Knob (between Pell and Nathan, N of Isle au Haut) . Not terns seen, but gulls ashore.

Great Cormorants:

Survey of Great Cormorant nesting sites in Jericho and Penobscot Bays

June 5, 10:35 Black Horse, 0 Great Cormorant (GC) nests
10:40 White horse, 5 Double-crested Cormorants (DC) nests west side.
2 ad, 1 imm. GC. 0 GC nests
10:48 Little Spoon SE: 35 adult GC, 22 GC nests, 35 DC nests.
Little Spoon NW: 32 DC nests, 19 GC nests, 1 ad displaying. 39 adult
GC, 1 Immature.
11:10 Great Spoon Spit, north end from the east: 16 GC nests, 27 adult, 1 imm
Highest part of the spit from the east: 18 GC nests plus 3 adults
displaying. 38 ad. GC, imm and 1 DC.
12:00 Mason: 2 crows, 35-40 DC nests, 0 GC nests.
12:08 Brimstone: 14 GC nests, 29 ad GC.
John's Island: 35 DC nests, 1 GC nest., 6 imm, 2 ad. GC.
south side: 10 imm GC, 2 ad GC east side. 0 nests on the NE Corner. 4
GC imm with 5 DC ad. North shore.
14:50 Saddleback: 4 adt and 7 imm GC roosting on the southern Knob. 0 GC
nests.
15:05 Southern Mark, NE shore: 100 DC nests, 1 or 2 GC nests, one obscured
by a rock. 57 DC nests on the middle eastern shore, 0 GC, 85 DC ad.
15:24 Green Ledge: 23 GC nests and one adult displaying, 39 adult GC, 6 DC
nests and 12 adult DC.

May 15 Little Roberts: 10 GC nests and 4 ad GC displaying without nests

Late May Seal Island NWR reported by Andre Breton: 12 GC nests.

July 20 Little Duck Island: no GC nests seen. There had been one in 1999. Due
to the late date of the visit I can only conclude that there was no
successful nest on Little Duck this year.

Total: 136 Great Cormorant nests found in the mid coast area. This total is slightly down from 149 in 1999. This continues the slow downward trend of the population. There were 265 GC nests in the same area in 1995.

Black Guillemots and mink on the islands SE of Vinalhaven: Otter, Roberts, Carvers, Hay

This work was supported by the Petit Manan National Wildlife Refuge. In past years, the Maine Department of Inland Fisheries and Wildlife and the Vinalhaven Land Trust have also supported work.

Mink were living on these islands in 1995 and an effort was made to trap them for the sake of the seabirds. Mink were trapped off the islands and the number of guillemot nest sites that successfully hatched chicks on the four islands went from 12 in 1996 to 123 in 1999, the second mink-free season.

Otter Island was checked for mink signs in mid-May 2000. There was no sign of mink found for the third year.

On May 15, 2000 adult guillemots were counted around the four islands between 07:30 and 09:00. There were 143 around Carver's, 65 around Roberts, 120 around Little Roberts, 44 around Hay, and 227 around Otter.

The results of the search for Guillemot burrows: (We described a site as having hatched a chick if we found chick guano)

- 31 sites on Otter Island that had hatched chicks, down from 56 in 1999,
- 3 sites on Hay that had hatched chicks down from 11 in 1999,
- 13 sites on Roberts that had hatched chicks, down from 18 in 1999,
- 8 sites on Carvers that had hatched chicks down from 41 in 1999.

There was fresh mink scat found on Carvers, and what looked like a mink run on Otter. At least one Mink found its way to the islands during this nesting season. The total number of sites found where there was sign of guillemot breeding effort in 2000 was similar to that in 1999. There was some guillemot breeding success despite the mink—especially at Roberts and Otter. The variation in success between islands was probably due to the timing of the arrival of the mink, or the amount of time spent on each island, and perhaps on what part of the island the mink concentrated its foraging effort. There were a high proportion of the sites found on Carvers that had unhatched eggs suggesting that the mink got there earlier and caused most of the adults to abandon their eggs.

Seal Island – Andre Breton, SRP, National Audubon Society

Tern Management

1. GOMSWG Census Results and Species Ratio:

Census Dates: 15 June through 16 June
 Census Hours: 9 hours

Census Results:

Year	Unadjusted Total	Adjusted Total	Correction Factor
2000	1963	2095	1.067
1999*	1913	1951	1.02
1998	1848	1973	1.068

*Originally reported incorrectly as 1993 (unadjusted) and 2037 (adjusted). The numbers presented above are the corrected census totals for 1999.

Species Ratio:

Year	% COTE	Number Pairs	% ARTE	Number Pairs	Nests Identified to Species
2000	57.5	1205	42.5	890	683
1999	47	936	53	1060	546
1998	47	972	53	1045	353

2. ARTE Productivity

- # Nests: 60
- # Eggs: 114
- # Eggs hatched: 101
- # Chicks fledged: 55
- Mean Clutch:** 1.90 (1999: 1.83, 1998: 1.85) - SD: 0.35
- Mean Hatch:** 1.68 (1999: 1.6, 1998: 1.51)
- Mean Fledge:** .92 (1999: .90, 1998: .90) - SD: 0.38

3. COTE Productivity

Nests: 35
 # Eggs: 77
 # Eggs hatched: 68
 # Chicks fledged: 27
Mean Clutch: 2.20 (1999: 2.70, 1998: 2.0) – SD: 0.58
Mean Hatch: 1.94 (1999: 2.43, 1998: 1.81)
Mean Fledge: .77 (1999: .96, 1998: .87) – SD: 0.43

4. ARTE Feeding Study

Summary of Effort and Feeding Rate:

Year	Observation Hours	Total Feedings	Feeding Rate
2000	896.35	1643	1.83
1999	878.0	2277	2.59
1998	902.75	2089	2.31

Summary of Major Prey Items (sample includes all nests in Feeding Study):

Year	Prey Item Description	Total Feedings	Percent of Diet
2000	Amphipod	502	30.55
1999	Amphipod	1069	47.0
1998	Amphipod	307	17
2000	Herring	256	15.58
1999	Herring	75	3.29
1998	Herring	188	10
2000	Hake	497	30.25
1999	Hake	756	33.2
1998	Hake	1208	66

Summary of Major Prey Items for Fish Specialist Nests (fed <30% Amphipods to their chicks):

Year	Prey Item Description	Total Feedings	Percent of Diet
2000	Hake	434	39.82
1999	Hake	506	56
2000	Herring	217	19.91
1999	Herring	52	6

5. ARTE Metapopulation Study:

Chick's Banded: 230
 Adult's Banded: 101
 Birds Resighted wearing ARTE Special Bands: 71 (all banded on SINWR in 1999)

Gull Census:

Census Dates: 23-May through 25-May
 Census Hours: 10.5

Summary of Nests Encountered by Species during the Gull Census:

Species	2000	1999	1998
<i>HERG</i>	127	130	90
<i>GBBG</i>	149	162	129

Atlantic Puffin Management:

First Observed Feeding: 6/19/00 (1999 June 19th, 1998 June 17th)

Breeding Pairs: Currently at 123 pairs. Status: Late season team will be continuing observation to determine pairs of Puffins nesting on the island until August 18th.

Pairs in 1999: 115

Matinicus Rock NWR – Chris Maranto and Susan Schubel, SRP, National Audubon Society

Census:

We conducted the GOMSWG nest count on 18, 19 June. The Arctic Tern Nest Count was 935 with a Lincoln Index of 1.101 yielding an adjusted total of 1030 Arctic Tern nests (968 adjusted in 1999). This year we did a direct count of Common Terns in the main Common Tern nesting area yielding 176 nests (compared to 102 in 1999). The combined nest count for Arctic and Common Terns is 1206 nests (compared to 1070 in 1999).

Table 1. GOMSWG census numbers 1990-2000.

Year	ARTE	COTE	Total Terns	LAGU
2000	1030	176	1206	355
1999	968	102	1070	367
1998	791	97	888	343
1997	934	90	1024	322
1996	865	148	1013	358
1995	990	247	1237	285
1994	1049	218	1267	290
1993	1000	95	1095	271
1992	991	146	1137	231
1991	1161	200	1361	181
1990	1252	25	1277	203

Tern Productivity:

We monitored 83 Arctic Tern nests from laying to fledging for our productivity figure in 2000. For the 2000 field season, Arctic Tern productivity is 0.904 Chicks Fledged/Nest, a slight increase from 1999's value of 0.869 Chicks Fledged/Nest (0.43 Chicks Fledged/Nest and 1.06 Chicks Fledged/Nest in 1998 and 1997, respectively).

Table 2 . Hatching Success, Fledging Success, and Productivity, 1996-2000.

	1996	1997	1998	1999	2000
Hatching Success	0.73	0.88	0.64	0.82	0.88
Fledging Success	0.44	0.67	0.38	0.56	0.53
Productivity	0.59	1.06	0.43	0.87	0.90

Tern Feeding Study:

During the 2000 field season, we observed fifty-four Arctic Tern nests to identify prey items provisioned to chicks. Sixty-six percent of the chick diet consisted of fish, 45% of which was White Hake and 12% Atlantic Herring. Atlantic Herring increased by 6.6% in the chick diet compared to the 1999 field season while the percentage of White Hake in the diet was similar to 1999 values (5.4% in 1999). Sand Lance, which was seen in the early hatching of 1999 was rarely seen this year, comprising only 0.2% of the chick diet (3% in 1999).

Thirty-four percent of the chick diet consisted of invertebrates, 30% of which were amphipods, *Gammarus sp.* This percentage is approximately 5% less than the 1999 field season (39.1% in 1999).

Atlantic Puffins:

Native Chick Return Rates:

Banded puffin chicks are resighted during each field season in order to estimate juvenile survival rates for cohorts. The survival rate for juveniles is strikingly high in some years. For the 1993 cohort of banded chicks, 89% of the juveniles survived. Similarly, 1995, 1996, and 1997 have high survival rates of 82%, 88%, and 69%, respectively.

Table 3. # Banded Chicks, #Resighted Chicks by 2000, and % Recovery for 1988-1999

Year	# Banded Chicks	# Resighted by 2000	% Recovery
1988	14	11	79%
1989	10	2	20%
1990	26	4	15%
1991	26	14	54%
1992	28	16	57%
1993	37	33	89%
1994	50	34	68%
1995	51	42	82%
1996	34	30	88%
1997	54	37	69%
1998	77	43	56%
1999	68	1	1%
2000	69		

Island Wide Puffin Census:

We began the first year of the island wide puffin census, an effort that will allow us to determine the number of breeding puffins on the island with some confidence in the next few years. We expanded into previously unobserved areas of the island to locate and permanently mark active puffin burrows in addition to checking the status of previously marked burrows. We found several new burrows which will facilitate the puffin census in ensuing years. This year we found 203 active puffin burrows by the presence of a chick, egg, or a feeding (176 active burrows in 1999).

Razorbills:

This year we visited the Razorbill nesting area at the end of May to ascertain the number of breeding pairs on Matinicus Rock. To minimize disturbance we made two nest sweeps in the main Razorbill nesting area. In early May we found 136 active Razorbill nests by the presence of an egg or chick. This figure can not be compared to previous years because this is the first year of a thorough nest count in May.

Common Murre:

This is the ninth season of the Common Murre attraction program on Matinicus Rock. This year we had record high numbers of Common Murres on the island. During the week of 10 June to 17 June it was not unusual to find at the minimum 50 COMU on the island at one time. We consistently saw 20-30 Common Murres on Murre Ledge (the location of the decoys and sound recordings) during 5 June to 17 June. This is a significant increase in Common Murre sightings from 1999. During the 1999 field season we had a high count of 7 murres on 26 May in contrast to a high count of 50 on 15 June during the 2000 field season.

Manx Shearwater:

The Manx was seen and heard calling consistently throughout the summer from 17 May to 5 August. It often arrived on the island between the hours of 2100-2300 during the month of July. The Manx burrow was checked on 1 August to determine burrow activity. The burrow had fresh nesting material, grasses and a piece of fresh ragweed but was otherwise empty. The burrow is 79 cm in length.

Metinic Island (North end): - Peter Waryzbok, Petit Manan NWR, USFWS

Tern Attraction:

This was the third season that active tern attraction techniques were employed on Metinic Island. A large area on the northeast end of the island was enclosed with electric fence, to prevent sheep from grazing within the restoration area. COTE and ARTE decoys were placed within the fenced area and a recording of an active tern colony was played continuously throughout the season. Eight nests were built within the attraction area this season. No terns had utilized the area in previous years.

Productivity: 1st egg discovered on May 28th.
1st chick hatched June 20th.
1st chick to fledge on July 10th.

- At the time of the GOMSWG census on June 15th, there were 41 COTE and 33 ARTE nests on the north end of the island. This represents a tremendous increase from just 3 nests (2 ARTE & 1COTE) at the same time last season. A total of 108 nests were found during the season. This increase is likely due to ongoing gull control and tern attraction practices. The mean clutch size for the colony was 2.1 eggs / nest. COTE had a mean clutch size of 2.27 (n = 55) and ARTE had a mean clutch size of 1.98 (n = 41).

- Hatching success for the season was only 31.65%, due primarily to a high degree of predation. We attributed nest losses at 66 of the 108 nests to predation, and an additional seven nests were abandoned.

- We banded 70 chicks (35 COTE & 35 ARTE) during the season.

- Productivity plots were not established, so fledgling success could not be precisely determined. Thirteen chicks are known to have reached at least 15 days, which coincides with the number of fledglings observed flying at the end of the season.

Predation:

There was a high rate of nest loss (61%) on the north end of Metinic by an undiscovered nocturnal predator. Repeated attempts were made to discover the culprit (including the use of night vision goggles), but we were not able to identify the predator. The most reasonable explanation at this time is the presence of 1 or 2 specialist gulls that fed at night. A female merlin was also observed on a semi-regular basis on the island, but was never observed near the tern colony.

Provisioning Study:

Observations began June 22nd and continued until July 19th. We observed 466 feedings at 12 nests. Hake (39.5%), herring (29%), and amphipods (15.2%) were the predominant species in the diet of the chicks. Pollock, sandlance, butterflyfish, stickleback, and insects were also present in small amounts. At three ARTE nests, amphipods made up greater than 20% of the diet. This represents the majority of overall amphipod observations.

Gull Control:

Gull control efforts were initiated on April 25th and continued throughout the season. We used non-lethal techniques (bangers, screamers, and human presence) to discourage gulls from nesting and loafing on the north end of the island. We removed four injured gulls (1 GBBG & 3 HEGU) from the island. We limited gull productivity by puncturing eggs and / or destroying nests. A total of 266 HEGU and GBBG nests with 733 eggs were destroyed.

Common Eider:

We located 47 eider nests on the north end of the island. When checked later in the season, 4 (8.5%) had been predated and 34 nests (72%) contained egg membranes, indicating that some of the eggs had hatched. The fate of the other nine nests could not be determined from nest contents. A total of 107 eider creches were observed between June 1st and July 25th. The number of ducklings per creche ranged from 1 to 75, with a mean of 16 ducklings. Both the number of creches observed and the number of ducklings per creche generally decreased as the season progressed. We observed four GBBG predation attempts on the creches, three were successful.

Black Guillemots:

We located 32 black guillemot burrows on the north end of Metinic. We banded 23 chicks at 16 nest sites. There were an additional six chicks that we did not band (too small or could not reach), and four burrows that had been predated on by gulls. Two adults BLGU that had been killed by gulls were also found outside of their burrows.

Other:

We observed 110 species on, or around, Metinic Island during the tern nesting season. We confirmed breeding by 19 of these species.

Metinic Island to Eastern Egg Rock (Muscongus Bay) – Brian Benedict, Petit Manan NWR, USFWS

June 13, 2000 – No terns nesting on the following islands:

**Little Egg Rock, Shark Island, Franklin Island, Old Hump Ledge
Hart Island, Gunning Rocks**

The Brothers (Port Clyde) - this is a loss of 1999's six nesting pairs

Hay Ledge – no nesting but 70 Common Terns were observed loafing on the rocks in the intertidal zone.

Eastern Egg Rock – Sarah Carr, SRP, National Audubon Society

Census:

Eastern Egg Rock was filled to bursting during the 27th season of research. The census was completed between the 19th and 20th of June. The Common Terns increased by 238 pairs over the 1999 season total. With a Lincoln Index of 1.036 the adjusted nest count was 1443 nests. This was the highest number of pairs ever to nest at Egg Rock, and this reversed the slight downturn in 1999 nesting pairs. Roseate terns also increased by 15 pairs to an all time high of 165 pairs. Roseate numbers have been increasing every year since 1987. Arctic Terns decreased by 6 pairs from last year ending with a total of 85 nests. The decrease was due to predation by Herring and Great Black-backed Gulls early in the season. Laughing Gull numbers increased 306 pairs continuing the explosion of Egg Rock's Laughing Gull population to the astounding number of 966 pairs. The population has been continuously increasing since the 1995 count of 234 pairs. This year's Common Eider count was 110 nests, a number that would surely increase if nests were counted within the island's thick raspberry stands.

Feeding Studies:

Common terns fed 60% herring, an increase of 47% over 1999. The proportion of hake decreased to 33% of the total of Common Tern diet and pollack made up 2.2%. The feedings per hour increased from 1.15 in 1999 to 1.6 which is consistent with the feedings per hour rates in 1997 and 1998. Roseate Terns fed 254 Herring meals out of a total of 408 feedings. This is an increase of 56% and comprises 63% of the Roseate diet.

Productivity:

The productivity of Arctic Terns increased from .2 fledglings per nest to .76 per nest. Fifty percent of the chicks that hatched survived to fledgling age. The Roseate Terns fledged 1.2 chicks per nest, almost identical to the 1999 rate—an increase of 98 chicks. Common tern productivity was almost equal to 1999's number—a downslide from the previous two years.

Puffins:

Atlantic puffin numbers increased this year by two burrows to an all-time high of 35 pairs. The number has been steadily increasing since 1994.

Gull Management:

During the 2000 season, five Great Black-backed (GBBG) and nine Herring Gull (HERG) nests were destroyed. This is a decrease from the 26 Herring Gull nests destroyed in 1999. The same number of black-backed nests were destroyed this year as last. In addition, six herring and one great black-backed gull were shot with a .22 rifle. This is more than the single gull shot in the 1998 and 1999 seasons. The large gulls heavily predated the Arctic Terns and also the Common Tern productivity plots in June and July.

Manx Shearwater:

A Manx Shearwater was seen regularly throughout the season, starting on May 21. In the beginning of July, the manx sat on the island for a half hour—the first ever recording of a manx on Egg Rock. The bird was seen every day of the last month. For the last 10 days of July, the bird would vocalize and land on the island as darkness fell.

National Audubon Society, SRP Education Program – Pete Salmansohn

With the able help of intern Jason Magoon, we spoke to approximately 3,700 paying passengers this summer aboard the *Hardy Boat* (based in New Harbor) and the *Pink Lady* (Boothbay Harbor). This number is slightly below last year's total, due to numerous days of rain and high seas.

We took 6 school groups out to see the restored puffin and tern colony in May before the tourist season began. We also hosted a puffin cruise for more than 20 adult members of the Penobscot Bay Stewards.

During our Spring school outreach program, we visited 29 classes in 12 different schools, working with 580 students. Most of these classes received multiple visits, allowing us to build depth into our presentations.

Pemaquid Point to Outer White Island (including Boothbay and Sheepscot Bay) – Brian Benedict, Petit Manan NWR, USFWS.

June 14, 2000 – No terns nesting on the following islands:

**N and S Sugarloaf Island, Seguin, The Black Rocks, Damariscove Island
Pumpkin Island, Outer White, Inner White, Fisherman, The Hypocrites
The Cuckolds, Lower Mark, Cat Ledges, Whaleback Rock**

Pond Island – Lauryn Benedict, SRP, National Audubon Society

General information:

May 5th through August 5 marked the fifth field season of Common Tern restoration on Pond Island NWR at the mouth of the Kennebec River. Management activities on Pond I. began in 1995 and the colony, which is still in its initial phases, has grown significantly over the past few years. The first common tern eggs were laid on Pond in 1996, and in 1999 the first native chicks hatched and fledged. The 2000 season saw record high numbers of individual birds, nests, and eggs. Social attraction equipment consisting of Common Tern decoys and sound recordings were installed for the course of the summer to promote further colony growth. Because of its abundant habitat and location near a rich fishery, Pond Island possesses huge potential as a seabird island.

COTE Time Table:

May 23 - first 1-egg nest
June 22 - first chicks hatched
July 17 – first flying fledglings observed
August 2 – COTE high count of the season: 232

Census:

The GOMSWG census, conducted on June 18th by Keri Parker, Lauryn Benedict and Dacey Mercer, revealed 33 Common Tern nests. Scattered around the island, researchers found 3 1-egg nests, 10 2-egg nests, 19 3-egg nests, and 1 4-egg nest. This marked a significant increase from the 1999 census, which tallied only 10 Common Tern nests. After the designated census period 21 additional nests were laid for a total of 54 nesting attempts on Pond Island during the summer of 2000.

Productivity:

Productivity estimates were generated both from Common tern nests marked during the GOMSWG census and from later nesting attempts. Direct observation of all nests on the island indicated that 50 chicks hatched, and 13 survived to fledging. Nests present on June 18th had a fledging rate of 0.394 chicks per nest (SD - 0.9). Nests laid after the census date had a productivity of 0.0. Only two

chicks hatched in a late nest, and none survived to fledging. Fledging success was lower this year than in 1999, when 16 of 20 chicks survived. The decrease was due to predation problems, rather than lack of food or exposure. Of the 33 GOMSWG nests, 16 were entirely lost to predators. In the remaining nests all young tended to survive equally well with no bias towards first-hatched chicks.

Feeding studies:

Chick provisioning studies were performed on five Common Tern nests that were followed to at least fifteen days. Seven other nests were followed until the chicks died or disappeared, and data from all 12 sites are included in provisioning calculations. A total of 584 food items were fed to chicks during 154.5 hours of observation, for a rate of 3.78 items per hour. The average food size was 1.60 times the culmen length of the provider. Sand lance was the primary food item, making up 70.2% of all deliveries (average size: 1.64). 9.6% of food deliveries were hake (average size: 1.4) and 7.0% were Herring (average size: 1.65). 12% of provisioning items were unidentified.

Predator control:

Predation problems continued during the 2000 field season and a number of predator control measures were employed. All gull nests were destroyed to prevent nesting anywhere on the island. No gulls were seen in the colony, but predation of eggs and chicks is suspected. Twenty-eight of 50 chicks that hatched on the island disappeared, often very soon after hatching. All attempts to locate the predator failed, but many chicks were lost at night. To compound this problem, most adults were abandoning the colony around 2130 and returning at 0430. Great Horned Owls visited the island several times, killing at least 14 common tern adults. Five padded leg hold traps and two Swedish goshawk traps were active for a combined total of 6,483 trap hours, during which, no owls were captured. Researchers also monitored the colony for 69.5 hours at night, but saw no predators.

Eider census:

On May 28th, at the start of the season, 40 Common Eider nests were censused and marked. In mid-June they were rechecked to determine hatching success. 79.0% of eggs hatched, as determined by eggshells remaining in the nests. After hatching, the high count of ducklings on the island was 24, but this is a very conservative estimate of the number present. The highest count of adult Eiders was 254 on July 4th.

Pond Island NWR – Anne and Walter Gamble, Georgetown, Maine

see attachment

Jenny Island – Mandy Lightcap, SRP, National Audubon Society

The 2000 season on Jenny Island was a typical due to major predator problems. To varying degrees, a mink, Black-crowned Night Heron and Great-Horned Owl all caused problems in the tern colony. Consequently, productivity was extremely low and feeding studies were limited.

Jenny Island's census was conducted on June 15th. That day 983 nests were counted and with a Lincoln Index adjustment factor of 1.074, the total count was adjusted to 1050 Common tern nests. Compared to the 1999 season, numbers were down by 79 nests. This decrease may be due to mink disturbances early in the season.

In 1999, eight Roseate tern pairs nested on Jenny, however, this year no Roseate nests were found. The Roseates may have abandoned the island early in the season due to mink disturbances.

Due to predation events, Common Tern productivity was next to nothing this season. Out of 68 sample nests, only one chick fledged successfully, making a productivity of .015 chicks per nest.

Feeding studies were scarce this year because of a lack of chicks. In 133.5 hours, 188 feedings were seen, 169 of which were identified. Out of 188 feedings, herring was by far the most prominent fish, making up 53 percent of the total. Hake made up 19.7 percent of feedings, while pollock and sand lance each made up 5.3 percent. The remaining 16.7 percent included small amounts of unknown fish, cunner, alewife, lumpfish, amphipods, stickleback, bluefish and one dragonfly.

Jenny Island had a rough season right from the beginning. When we arrived on June 4th, we began finding dead Common Terns, presumably killed by a mink. Some were found in small caches (up to four birds together), and all were bitten on the back of the neck. The mink was seen twice during the season and fresh tracks were found almost daily in June. We continued to find dead terns and see large disturbances in the colony until mid-June. The mink apparently left for 2 ½ to three weeks during mid-season, but returned in July. By the end of the season, we had found 45 adult Common terns and 9 fledglings killed by the mink. Also, on the Elm Islands (approx. 1 mile SW of Jenny) we found a dead Herring gull who had been bitten on the back of the neck and left on it's nest. This finding suggests that either, there is more than one mink in the bay, or the mink on Jenny visited other islands.

Phil Bozenhard, a trapper from the Maine Department of Inland Fisheries and Wildlife, came to Jenny Island on June 19th to set lethal conibear traps. He set five lethal traps and one "Hav-a-Hart" trap around the island, but the mink was never caught. Also, blind stints were done with the rifle to try and shoot the mink, but it was never seen while in the blinds.

On the 22nd of June, we noticed very young chicks missing from the productivity plots, and on the 24th of June, a Black-crowned Night Heron landed on the island. The heron was seen and heard periodically throughout the rest of the season. By mid-July most chicks from the productivity plots were missing out of 68 nests only one chick fledged. As soon as the heron was seen, we began doing all-night stints with a night-vision scope mounted on a rifle. Night stints continued for 3 ½ weeks, but the heron was rarely seen while in the blinds. Two shots were fired at the heron, but both missed. By the middle of July, the only chicks left on the island were in thick vegetation and the heron seemed to stop visiting.

On July 11th, a male Great-Horned Owl was trapped with a padded leg-hold trap. No owl kills were found that day or any other day this season. We banded and then relocated the owl approximately 80 miles inland at Mt. Blue near Weld, Maine.

Many hours were put into trying to shoot or trap predators this season. Unfortunately, most attempts failed. Most adult terns abandoned the island at night, which may have added to the low productivity. Luckily, we were able to trap an owl, but the heron and the mink will most likely come back next year.

Casco Bay Islands – Bob Houston Gulf of Maine Program and Jane Arbuckle Maine Coast Heritage Trust.

Date: June 18, 2000
 Weather: Clear, warm
 Staff: Jane Arbuckle, Bob Houston
 Boat: USFWS, Bob Houston driving

Visited historic nesting sites in west Casco Bay.

Site	# Terns Nesting	# Terns Observed	Other Obs.
College Rock	0	0	10-12 creches Of eiders
Outer Green	0	0	2 puffins fly 12 guillemots

Junk of Pork	0	0	Eiders, m&f BB & HEGU Cormorants
Inner Green	0		100+eiders in water
Grassy Ledge	0	30+ COTE	1 predated COEI nest
Black Rock	0	0	0
Brant Ledges		100+ COTE	feeding and roosting
Sister Island Ledge	1	2	first since Pre-1984
French Is Ledge	0	75 COTE	Roosting, Feeding 1 osprey nest 2 grt blue
Little Whaleboat Ledge	0	150-200+ COTE	Feeding, Roosting
Nubbin	0	0	a few eiders
Clapboard Island Ledge	0	0	6+ COTE Feeding

Summary: one nesting pair of COTE observed in west Casco Bay. 350-400 COTE observed feeding and roosting. This has not been observed in the past.

Stratton Island – Hilary Cerny, SRP, National Audubon Society

The Stratton Island field season opened on May 18th and was closed on August 5th, 2000. The first Common Tern egg was found May 20th and the first chick was found on June 12th and on July 7th the first Common Tern fledgling was seen. The first Roseate chick was found on June 16th and the first fledgling was seen on July 14th.

Census:

The annual heron census was conducted on May 26th and 27th. The number of Glossy Ibis nests decreased from 154 nests in 1999 to 86 in 2000. The Snowy Egret/ Little Blue Heron numbers also decreased from 163 to 125. The number of Black-crowned Night-Heron nests increased from 19 to 24 nests. Four immature and two adult Tri-colored Herons were seen at the end of the season suggesting that one pair may have nested.

Heron Species	# of Nests
Glossy Ibis	86
Snowy Egret/ Little Blue	125
Black-crowned Night-Heron	24
Great Egret	1

The five-year gull and eider census took place between the 21st and 27th of May, and covered Stratton, Bluff and Little Stratton Islands. Eight Great Black-backed Gull nests were destroyed and 31 Herring Gull nests. One juvenile Herring Gull with a broken wing was killed.

Species	Number of nests	
	1995	2000
Great Black-backed Gulls	342	214
Herring Gulls	238	254
Common Eider	188	1,158

The Double-crested Cormorant census took place on June 28th. Stratton and Bluff Island had 168 nests, which was a decrease from 209 in 1999.

The Common Tern census conducted on June 13th and 14th. The census found 1,057 nests, which was adjusted to 1,109 nests using the Lincoln Index. The Roseate Tern nests were located during the GOMSWG census period and 104 active nests were found. Nine Arctic Tern nests were found during the census period, as well. All census totals were very similar to 1999.

Productivity:

Common Tern productivity suffered this season due to a heavy rain storm on July 16. Twenty-two chicks were found dead within the productivity plots and feeding studies. Fledge success was estimated to be 1.6 per nest before the heavy rain.

Roseate Tern productivity decreased from 1.7 fledge per nest in 1999, to 1.4 per nest this season. However, if the eggs did hatch the chicks had a 94% chance of survival.

Arctic Tern productivity was low this year, as usual. Three nests were taken by the high tides in July, and of the chicks that hatched only three chicks survived to 15 days.

Species	Mean Clutch	
	Size	# Fledge/nest
Common Terns	2.3	1.1
Roseate Terns	1.9	1.4
Arctic Terns	2	0.3

Provisioning Study:

Feeding studies were conducted at 15 Common Tern nests and 11 Roseate Tern nests. The average feeding rate for Common Terns was 1.5 feedings per hour, and the feeding rate for Roseate Terns was 1.6 feedings/hour. Sand lance was by far the dominant prey for both species of terns, comprising 48% of the Common Tern diet and 96% of the Roseate Tern diet.

American Oystercatcher:

Three American Oystercatcher eggs were found on May 18th. In early June, two eggs were missing and one dead egg was present in the nest site. On June 25th, three additional eggs were found near the original site, but were missing soon after. The fate of the nest could not be determined.

Human Visitation and Education:

This season 443 people visited Stratton Island, 110 of those came on organized Maine or Prout's Neck Audubon trips. The majority of visitors were fascinated by our tern work, with the exception of one jet skier.

South Coast Beaches (Least Terns) – Susan Hitchcox, Maine Audubon Society

Maine Audubon, in conjunction with the Maine Department of Inland Fisheries and Wildlife, conducted a nocturnal monitoring project for the Least Tern colony at Laudholm Beach in order to decrease the incidence of nocturnal predation. The project was begun in early June when, in cooperation with the Wells Estuarine Reserve, two interns working for Maine Audubon set up an observation platform and tent and began nocturnal observations. The two interns alternated nights and watched the colony from 8 p.m. until 6 a.m. every night from early June through early August. They used binoculars and a spotting scope to identify disturbances. They successfully deterred predators by yelling, chasing, and using a high power spotlight. Interns recorded and reacted to disturbances on 44 of the 65 nights of observation. On half of these nights, there was only one recorded disturbance over the 10-hour period.

There were a total of 72 disturbances recorded during the season, which is slightly more than recorded at the same site in 1999. However, the 2000 season was several weeks longer. As in 1999, deer were the most common disturbance in the colony and accounted for 27 of the 72 disturbances (38%). Twenty-two (30%) of the disturbances could not be identified, while there were 15 disturbances (21%) by foxes. This is an increase compared to last year when there were only three disturbances by fox. Human disturbance was not as much of a problem this year compared to previous years (11 disturbances last year, only 2 in 2000), though that was likely due to the intervention of interns before any disturbance was documented. People, and especially dogs, continue to be a major source of concern at this site as far as colony survival. Missing from this year's observations were rabbits, skunks, minks, coyotes, and Common Terns, which were all recorded, though infrequently, in 1999.

There were a total of 103 eggs in 54 nests over the course of the season at Laudholm Beach. Unfortunately, the vast majority of nests were lost to high tides in July and August. However, it is unlikely this many eggs would have hatched without the presence of all-night monitors to deter infrequent but potentially high-impact predators.

White and Seavey Islands, Isles of Shoals – Diane DeLuca, New Hampshire Audubon Society
Field Biologists: Dan Hayward and Mathieu Charette

Background:

In 1997, the Audubon Society of New Hampshire (ASNH), the New Hampshire Fish and Game Department Nongame Program (NHF&G), the Office of State Planning Coastal Program (NHCP), the Department of Resources and Economic Development - Parks Division, USDA - Animal Damage Control, Shoals Marine Laboratory, Isles of Shoals Steamship Company, Gulf of Maine Seabird Working Group and the US Fish and Wildlife Service worked cooperatively to successfully complete the first year of this project by using nonlethal means of gull control along with decoys and tern colony sounds to attract breeding terns back to the Isles of Shoals. A small colony of six pairs of common terns raised and fledged six young at this site. This was the first documented breeding by terns at the Isles of Shoals since the early 1950s. The 1998 and 1999 field seasons saw significant growth as the number of breeding common terns climbed to 45 and 141 pairs, respectively.