

**Gulf of Maine Seabird Working Group
12 August 2002
Hog Island, Bremen, Maine, USA**

Compiled by Brenda Lord, Edited by Brad Allen
Maine Department of Inland Fisheries & Wildlife

Welcome & Overview - *Steve Kress, National Audubon Society*

Steve Kress welcomed the group to the 19th annual meeting of the Gulf of Maine Seabird Working Group (GOMSWG). After introductions were made, Steve explained that this group was initially organized to attempt to help the Maine coast tern population recover from about 50 years of decline. It started in 1984 with a small group, which has grown in participation, to the entire Gulf of Maine (the area from the tip of Cape Cod, Massachusetts to the tip of Cape Sable, Nova Scotia).

Progress Report

Common Terns - In 1984, we had about 2,500 pairs nesting in the Gulf of Maine. As of last summer, there were about 6,800 pairs, which is about 167% increase. Roseate Terns - in 1984, there were about 76 pairs in Maine. Last summer, there were 289 pairs, which is a 280% increase. These are all Maine coast numbers, including Machias Seal Island. Arctic Terns have also increased from 3,170 pairs to about 4,600 pairs last year - up 45%. While the Laughing Gull was not intended to be a recovery project, it has been. There were 314 pairs in 1984 and last summer, there were over 2,600 pairs, which is an increase of 738%.

Steve didn't have comparative numbers for Least Terns for that time period, but he did have some data for the Gulf of Maine for the last three years (since GOMSWG has been summarizing this entire region). In that three-year period, we did not see the dramatic increase that these other numbers would suggest. Things seem to be leveling off. The Common Tern population trend has basically been flat for the last three years, with about a 5% increase to almost 19,000 in this GOM region. Arctic Terns have actually declined about 10% in the last three years, as have Roseate Terns by 3%. Least Terns, for the last several years, have been on the increase by about 70%. This last increase is not just in Maine, but it's region-wide, with a 58% increase over the last three years in this GOM.

Part 1 – ISLAND SYNOPSIS

Ram Island, Buzzards Bay, Massachusetts – *Brendan Courtot, Site Manager; Brad Milne, Site Assistant; Katie Maguire, Intern; Carolyn Mostello, Project Leader*

Massachusetts Division of Fisheries and Wildlife staff, with funding from the New Bedford Harbor Damaged Resource Restoration Trust Fund, monitored Common Terns (*Sterna hirundo*) and Roseate Terns (*Sterna dougallii*) at Ram Island in Buzzards Bay, Massachusetts in 2002. Ram Island was cleared of nesting gulls in 1990-1991. The island, which is < 3 acres in size, has a cobble/gravel shoreline, tidal salt marshes, a mudflat lagoon, and a heavily vegetated interior of herbs and shrubs. Terns nest over the entire upland portion of the island.

Weather:

Weather in the 2002 breeding season was mild and unseasonably cool. There were no significant egg, chick, or adult mortalities attributed to weather or high tides.

Management Activities:

At Ram Island, thick vegetation and “woody” stems of herbaceous vegetation remaining from the previous season can impede access by terns to nesting sites. Prior to the terns laying eggs, we mowed and cut stems remaining from 2001 and manually removed some stands of *Rosa rugosa* to create more habitat for nesting terns. We also sprayed the herbicide Round Up® to reduce areas of dense vegetation (3ft. wide lanes every 3ft. in Common Tern habitat, and a 1ft. lane every 4ft. in Roseate Tern habitat). Nest boxes were distributed in Roseate nesting areas prior to the start of the egg laying period. Chick shelters were distributed near Common Tern nests that had little shade. Washed up lobster traps and other debris were removed from the island to minimize avian entrapment.

Census:

Common Tern - On 10 June, three observers counted Common Tern nests by systematically searching each 10 m² grid square on the island. In all, 2307 Common Tern nests were counted. This is a 22% increase over the number of nesting pairs in 2001 (1890) (Table 1).

Roseate Tern - On 16 June, five observers systematically searched each 10 m² grid square of appropriate habitat on the island and counted active Roseate Tern nests. Based on past counts, it was estimated that approximately 10% of nests were missed in the census, so an additional 10% was added to the count. In dense beach pea, flush counts were performed, and the number of adults counted was multiplied by a correction factor of 0.8 to convert the value to pairs. We estimate that 952 pairs of Roseates nested on Ram Island. This is a 52% increase over the number of nesting pairs in 2001 (626) (Table 1).

Increases in numbers of Common and Roseate Terns were most likely due to considerable decreases in numbers of both species at Bird Island, also in upper Buzzards Bay.

Reproductive parameters:

Common Tern - In all, 180 study nests were followed until hatching or failure, and 66 of those were fenced in to gather data on fledging success. Chicks were weighed at hatching, and again on day 4 or 5 and every other day until fledging, death, or our departure. Average clutch size (2.2 eggs/nest) and hatching success (89.7% of eggs hatched) for 2002 were consistent with earlier years. Fledging success (22.8% of hatched chicks fledged) and productivity (0.39 chicks fledged/nest) were much lower than usual (49.6% and 1.0 chicks fledged/nest, respectively, in 2001). The high chick mortality was attributed to starvation.

Roseate Tern - In all, 138 nests were followed until hatching. Chicks from 76 nests were weighed on days 0-3 to estimate fledging success. The average clutch size of 1.7 chicks/nest for 2002 was consistent with earlier years. Hatching success was 81.1%. Fledging success (67.0%) and productivity (0.96 chicks fledged/nest) were slightly lower than in 2001 (78.1% and 1.05, respectively). Most chick mortality this season can be attributed to the usual starvation of B-chicks.

Predation and Mortality:

There was very little predation recorded on Ram Island. this field season. Predation on Common Tern eggs (n=3 nests) was attributed to Ruddy Turnstones. Some gull predation on fledglings was evident. There were no signs of predation on adult terns.

Table 1. Numbers of pairs Common and Roseate Terns nesting on Ram Island, Buzzards Bay, Massachusetts, 98-2002.

Species	2002	2001	2000	1999	1998
Common Tern	2307	1890	2030	1887	1307
Roseate Tern	952	626	988	630	543

Penikese Island, Buzzards Bay, Massachusetts – Heather Ziel, Site Manager; Jenna Garvey, Site Assistant; Katie Maguire, Intern; Carolyn Mostello, Project Leader

Massachusetts Division of Fisheries and Wildlife (MDFW) staff, with funding from the New Bedford Harbor Damaged Resource Restoration Trust Fund, monitored Common Terns (*Sterna hirundo*) and Arctic Terns (*Sterna paradisaea*) at Penikese Island in Buzzards Bay, Massachusetts in 2002. After a pilot project in 1995, MDFW began non-lethal management of gulls in 1998 to restore tern populations to Penikese Island. One of the primary goals of the restoration project is to restore Roseate Terns (*Sterna dougallii*) to the island. Penikese is an 80-acre island dominated by grasses and large stands of shrubs. Terns nest only on the cobble shoreline. Most (75%) of the island is a Herring (*Larus argentatus*) and Great Black-backed (*Larus marinus*) Gull colony (688 and 133 pairs, respectively, in 2002).

Weather:

Weather in the 2002 breeding season was mild and unseasonably cool. There were no significant egg, chick, or adult mortalities attributed to weather or high tides.

Management Activities:

A field camp was set up within a 20-acre “project area” in which gulls were harassed and gull nests were broken up to discourage nesting. Fourteen Herring and 2 Great Black-backed gull nests were destroyed in 2002. One Great Black-backed Gull that was preying on tern chicks was shot. Nest boxes and other nesting structures were placed in appropriate Roseate Tern habitat to encourage nesting. Chick shelters were distributed near Common Tern nests that had little shade.

Census:

Common Tern - Nearly all Common Tern nests on Penikese Island were followed daily. An estimated 279 pairs nested on Penikese in 2002. This is nearly identical to the 2001 value of 278 pairs.

Arctic Tern - As in 2001, 2 pairs of Arctic Terns nested on Penikese in 2002.

Roseate Tern – No Roseates nested on Penikese Island in 2002, although they were frequently present near the nesting area.

Reproductive parameters:

Common Tern - In all, 407 nests were followed until hatching or failure, and 25 of those were fenced in to gather data on fledging success. Chicks were weighed at hatching, and again on day 4 or 5 and every other day until fledging or death. Average clutch size (2.4 eggs/nest; n=155) was consistent with

past years. Low hatching success (64% of eggs hatched vs. 88% in 2001) was due to predation on eggs. Poor fledging success (22% of hatched chicks fledged vs. 81% in 2000) and productivity (0.5 chicks fledged/ nest vs. 1.7 in 2000) were due primarily to predation on chicks, and secondarily to starvation of chicks. Data that support the assumption that food availability was low this year are: (1) feeding rates (0.61 prey items/h/chick) were lower than in past years (0.92 in 2000, 1.84 in 1999), and (2) kleptoparasitism was also noted for the first time on Penikese this year.

Arctic Tern – Only 2 Arctic Tern nests were present in 2002. Four eggs were laid. One egg hatched and one chick fledged.

Predation and Mortality:

Predation on Common Tern eggs was attributed to Ruddy Turnstones, Great Black-backed Gulls, and possibly Black-crowned Night-herons. A Great Black-backed Gull preyed on chicks. There were no signs of predation on adults.

Table 1. Numbers of pairs and productivity of Common and Arctic terns nesting on Penikese Island, Buzzards Bay, Massachusetts, 1998-2002.

Species		2002	2001	2000	1999	1998
Common Tern	No. pairs	279	278	126	101	137
	Productivity (chicks/nest)	0.5	n/a	1.7	1.2	n/a
Arctic Tern	No. pairs	2	2	2	6	6
	Productivity (chicks/nest)	0.3	n/a	0	0.5	0

Monomoy Islands, Massachusetts - Sharon Fish Marino

North Monomoy:

Census and Productivity: 36 nesting COTE pairs were counted on 22 June up from 5 nests in 2001. The nesting area on North Monomoy is subject to flooding during high tides and strong westerly winds. Birds continued to lay eggs in this area (and be washed out) through July. No chicks were seen all season. Productivity was not quantitatively measured but is assumed to be zero.

South Monomoy:

COTE:

Phenology - 1st terns seen around the island - 25 April

1st eggs - 22 May

1st hatch - 18 June

Census - A total of 7922 COTE nests were counted on South Monomoy Island on June 16, 17 and 18. The Lincoln-Index boosted the total to 8032 total nests, an increase from 7807 in 2001. No B-count was conducted, but an additional 158 nests (31% of the total 512 nests) were initiated in productivity enclosures after the census window, indicating an additional 3585 nests after 20 June.

Productivity - Determined using 354 (A-count only) nests in 27 fenced productivity enclosures and 1 unfenced enclosure.

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Average clutch size: 2.20 eggs/nest (SD = 0.70, N = 354 nests)	2.57 in 2001
Hatching success: 1.34 eggs/nest (SD = 1.13, N = 354 nests)	1.99 in 2001
Reproductive success: 0.71 chicks/nest (SD = 0.87, N=354 nests)	1.20 in 2001

Feeding stints were conducted following the same protocol used in 2001. For each hour long stint a study area was delineated and species, size and receiver were recorded for every prey item brought in. In general, sand lance has been the most commonly delivered prey item, followed by herring.

In total, over 1000 COTE chicks were banded, and 53 banded adults were resighted (trapped or found dead).

LETE:

Phenology - 1st terns seen around the island - 10 May
1st eggs - 29 May
1st hatch - 11 July

Census - LETE showed reproductive behavior on three areas of South Monomoy Island in 2002. They nested on the northeast tip, the Powder Hole area and on the south tip. In 2001 they nested only on the northeast tip. On 18 June, 6 active nests were counted on the south tip and on 18 July, 50 active nests were counted on the south tip. The birds were not successful on the northeast tip or Powder Hole area, but some chicks did make it on the south tip this season. The numbers slightly increased from last season which had only 16 nesting pairs.

Productivity - Productivity was probably low based on the few chicks seen. The high count was seven chicks. Coyote tracks and gull tracks were seen frequently in the colony.

ROST:

Phenology - 1st terns seen around the island - 16 May
1st eggs- 4 June
1st hatch - 24 June

Census - 3 pairs of ROST (3 nests) nested during the A-count window. Observers began looking for ROST nests in early May, and searched most days in June and July, weather depending. In total, close to 200 hours were spent looking for ROST nests.

Productivity - ROST nests were checked nearly every day; chicks were weighed from day 0-3.

Average clutch size: 2.00 eggs/nest (N = 3 nests of known completed clutch)

Hatching success: 1.33 eggs/nest (SD= 0.58, N = 3 nests)

Reproductive success: 1.0 chicks/nest (N = 3 nests)

* All nests hatched at least one egg. 3 chicks were followed past day 15, and 1 chick was not seen again after its hatch day.

BLSK:

Phenology - 1st seen around the island - 30 May

Individuals and small groups of BLSK were observed sporadically throughout the summer but did not nest.

LAGU:

Phenology - 1st seen around the island - 25 April

1st eggs - 31 May

1st hatch - 23 June

Census - On June 16, 17, and 18, 1094 active LAGU nests were counted, up from 805 in 2001 and 376 in 2000.

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

PREDATORS

GBBG AND HERG: Gull harassment was conducted in area A twice a day in May, and about twice a week in June and July. A census was conducted on 22 May; 169 nests were in Area B (145 in 2001) and 3 nests were in Area A (3 in 2001). Over half 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 12 June. There were no gulls nesting in area A. In area B, 6 new GBBG nests and 27 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 32 times and GBBG were seen in the colony 74 times. A total of 7 GBBG and 1 HERG were 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 and visits into the colony picked up around the estimated NOHA hatching window. NOHA were seen in the COTE colony 76 times on 31 different days from 20 May - 28 July. At least 2 adult terns found dead in the colony were likely killed by NOHA and at least 21 tern chicks were taken.

GREAT HORNED OWL: There was no sign of Great Horned Owl in the colony this season. Great Horned Owl were using the closed area signs in the colony as perches last season. We used triangular signs in 2002 to prevent perching.

COYOTE: A den of 10 pups were lethally removed from South Monomoy Island. At least 2 additional coyotes were in the COTE colony during the last week of June, and during the last two weeks of July. There was some evidence of depredation. In addition, coyote tracks were seen on a regular basis in the intertidal zone and berm area surrounding the COTE colony.

BCNH: Black-crowned Night-heron were first seen/heard in the COTE colony on June 1st. BCNH were seen and heard in the colony during June and July and were present most nights. BCNH caused most of the loss in the colony this year. A total of 7 adults and 3 juveniles were removed from the colony.

PEFA: A peregrine falcon was seen in the colony 17 June and was present again the first two weeks of August. There was evidence of COTE fledger and adult depredation.

LAGU: Kleptoparasitism continued this year with increased numbers of nesting LAGU. Kleptoparasitism was recorded during 1 hour long stints. Over 79 stints were conducted this season, with more than 803 kleptoparasitic attempts observed and recorded. LAGU were successful in 46% of

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the attempts, COTE were successful 29% of the time, the victor was unclear or undetermined 22% of the time and a dropped fish resulted in about 3% 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 control the area used by nesting LAGU. In 2002, vegetation control continued with the addition of 4 plots. The treatments and corresponding numbers of nesting COTE and LAGU (during the A-census window) are listed below:

Plots-Treatment, Season Established, Size	# COTE	# LAGU
Control (no treatment) 30 x 30 meter plot	0	67
Hand-pulled (spring 2001) 15 x 30 meter area	1	1
Landscape cloth (spring 2001) 15 x 30 meter area	20	10
Spray (fall 2001) and Rake (spring 2002) 30 x 30 meter area	16	28
Spray (fall 2001) and Burn (spring 2002) 30 x 30 meter area	325	6
Burn only (spring 2002) 30 x 30 meter area	128	9
Rake only (spring 2002) 30 x 30 meter area	1	61

** Productivity in these areas was low due primarily to BCNH predation.*

White and Seavey Islands, NH - Audubon Society of New Hampshire, Project Coordinator - Diane De Luca, Field Biologists - Dan Hayward, Kirsten Bixler, and Susan Elliott

Census:

Species	COTE	ROST	ARTE
Date	6/20/2002	6/20/2002	6/20/2002
A Wave	1273	8	1
Date	7/15/02	7/15/02	7/15/02
B Wave	414	17	-
Total Nests	1687	25	1

Lincoln's Index	Marked Nests Counted	271	Unmarked Nests Counted	0
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Population Information (A Wave):

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

Productivity (A Wave):

COTE

Year	1998	1999	2000	2001	2002
Nests Monitored	45	25	43	73	184
Mean Clutch Size	2.56	2.84	2.60	2.44	2.52
Mean Hatch	1.88	2.48	2.33	2.18	2.09
Fledglings/Nest	1.6	2.24	1.58	1.68	1.63
Total Fledglings	72	314	502	773	2075

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A storm on June 15-16 created 16 foot waves but did not appear to impact the colony as it occurred just before hatch. There were no other significant weather related problems. Predation was not observed up through July 8. A practicing chick was taken on July 8 and during the period from July 20 through July 27 approximately 35 chicks were taken including 1 confirmed arctic chick.

Feeding Study: Through July 30, 2002

COTE

# Of Nests	Observer Hours	Feeding Rate
39	727.05	0.96

Species	Hake	Unknown Fish	Blue Fish	Mackerel
% of Diet	54.71%	10.86%	6.00%	5.57%

With the exception of 2001, hake has always constituted the largest part of the diet on Seavey Island. This continued in 2002, with herring at 2.52% of food items. Mackerel continued to climb in the last part of July and early August.

ROST

# Of Nests	Observer Hours	Feeding Rate
8	54.05	1.31

Species	Hake	Mackerel	Sand Lance
% of Diet	43.66%	23.94%	15.49%

Feeding observations of Roseates were done from July 15 –August 2 and reflected the influx of mackerel into the area.

Predator Control:

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

All adults taken during the period of July 20-30 in an attempt to control the predation as large numbers of chicks began to fly.

Gull Control (Apr21-Jul31):

Control Method	Ave/Day	Control Method	Ave/Day
C, W	4.51	22	0.11
R	1.40	PG	0.04
W	1.27	C, R	0.03
C, R, W	0.77	NED	0.02
S	0.39	RK	0.02
C	0.22	R, W	0.01
B	0.13		

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

Other Nesting Species:

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

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Rare Bird and Other Tern Sightings - (total species seen thru July 31st=141)

American Oystercatcher-May 2, Jun 2, (2)18	Forster's Tern-Jul 31
Atlantic Puffin-Jun12,16	Least Tern-Jun19
Black Tern-May 12,25,30, Jun1, (2)10	Manx Shearwater- (2) Jun16
Caspian Tern- Jul16,31	Razorbill-Jun 1, 16, 22, (2) Jul 13
Clay-colored Sparrow- May 17	Summer Tanager-May 17

New Hampshire Mainland Colonies:

<u>Nest Site</u>	<u>#of pairs</u>	<u>Productivity Estimates</u>
Hampton Saltmarsh	~15	undetermined
Backchannel Islands	0	
Hen Island	12	min. 12 chicks
Nanny Island	0	
Little Footman	0	

Maine's Beaches – Least Terns - Jordan Perkins, University of Maine, Wildlife Ecology

Crescent Surf Beach:

A minimum of 103 Least Tern pairs were documented, making this the largest colony in Maine. One half of the early nests were lost to a storm in mid-June. A few eggs may have been taken by a chipmunk. Ninety-five chicks were banded to determine chick survival and fledgling departure rates. Of the banded fledglings, 75% were resighted after fledging. A total of approximately 100 fledglings have been sighted throughout the season.

Laudholm Beach:

A minimum of 12 Least Tern pairs were documented. Fox predation occurred repeatedly, and the highest predation rate was recorded at this colony. A number of nests also were lost to high tides and storms. Five chicks were banded to determine chick survival and fledgling departure rates. Laudholm Beach fledgling sightings were combined with Crescent Surf Beach because of the close proximity of the colonies.

Higgins Beach:

A minimum of 14 Least Tern pairs were documented. No losses to high water or predation were observed. Based on nest success rates, Higgins Beach was the most successful colony this season. Eight fledglings were seen during surveys.

Reid State Park:

The following two beaches have not produced fledglings since 1995 and breeding pairs have not been present since 1998.

Half Mile Beach:

About 25 Least Tern breeding pairs were recorded. Although almost half of the nests were successful, many chicks are suspected to have been predated by fox. Only two fledgling were seen during surveys. All Least Terns vacated the site by early August.

Mile Beach:

Only three Least Tern pairs were recorded nesting on this beach, which has high recreational activity. All nests were washed over by a mid-June storm, and there was no nesting recorded thereafter.

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2002 Least Tern Nest Outcome					
	Laudholm	Crescent Surf	Higgins	Half Mile	Mile
Total Nests	29	165	16	22	3
Successful	0.27	0.61	0.81	0.45	0
Predation	0.38	0.01	0	0.09	0
Water	0.28	0.30	0	0.05	1.00
Abandoned	0	0.05	0.13	0.05	0
Infertile (?)	0	0.01	0	0.00	0
Unknown	0.07	0.02	0.06	0.36	0

Tern Census and Season Summary

Census Date	Beach Name	LETE # *	Island Census Method	Productivity			Clutch Size	
				FL/Nest	N	Method	x Size	N
May-Aug. 2002	Crescent Surf	206	N	[100]	165	3	1.84	165
May-Aug. 2002	Laudholm	24	N	incl. in above #	29	3	1.89	29
May-Aug. 2002	Higgins	28	N	[8]	16	3	1.94	16
May-Aug. 2002	Reid State Park-Half Mile	50	N	[2]	22	3	2.17	22
May-Aug. 2002	Reid State Park-Mile	6	N	0	3	3	2.33	3

* Total adult birds

Stratton Island - Hilary Walter, National Audubon Society

Wading Birds: Conducted May 19

Glossy Ibis	Snowy Egret	Black-crowned Night Heron	Great Egret
126	148	27	5

Cormorants: Conducted July 11

Bluff Island	139
Stratton Island	73

Terns: Conducted June 13 & 16

Species	No.
Roseate Tern	98
Common Tern	1279
Artic Tern	8

Population trends from 1997-2002:

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

Tern Productivity:

	hatch/nest	Fledge/nest
Common Tern	0.4	0.1
Roseate Tern	0.9	0.6

Factors affecting productivity - The presence of a nocturnal predator was discovered on June 18. Poor weather prohibited earlier trips into the colony and consequently an earlier detection of the predator. The first night stint was conducted that same night. On June 19, a Black-crowned Night Heron was seen in the colony. The heron took 30 out of 60 eggs in study nests in one night. The heron was shot on June 25, but not before taking an estimated 500 nests, excluding nests failed due to nocturnal abandonment.

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

The first chicks to hatch on Stratton Island were affected by the “Funk”. Chicks tended to die within 24-48 hours. We had one Roseate chick recover from its symptoms and go on to fledge (5-day). All three tern species were affected. Six dead chicks were sent to the National Wildlife Disease Center for analysis on July 9. Preliminary results indicated that the chicks suffered paleness in the kidneys, as well as an enlargement of the kidneys. There was a build up of fine precipitated urates and an abundance of urates in the cloacae and uraters. Some chicks also had an excess of fluid in the lungs. Toxins or an infectious agent could cause these symptoms.

The third problem this season was the presence of a Great Horned Owl, which was spotted on July 9. Possible owl kills were found in mid-June, but these were overshadowed by the immediate heron problem. Four tern chick kills were found in mid to late July. Attempts were made to trap and hunt the owl, although they proved to be unsuccessful. Other points of interest included a week long visit from a Snowy Owl in mid-May and 533 visitors, with one day totaling 92 visitors!

Western Casco Bay - Jane Arbuckle, Maine Coast Heritage Trust and Bob Houston, USFWS

Clapboard Island Ledge, south (55-330):

Nest survey by ground on June 14; we found the population to have increased 500% from last year to a grand total of 5 common tern nests! Eight eider nests were also counted. A brief revisit on July 30 by BH revealed 6 adults flying around and 2 dead tern chicks (dead a long time, looked whole, no evidence of predation) at 2 different nest sites. No young were observed but it might have been too late in the season for observations. Uncertain of productivity for island. Egg counts in nests were 3, 3, 2, 2 and 1.

The Nubbin (55-223):

Survey on June 14 by boat revealed 1 pair of common terns with one of them appearing to be on a nest. No nests recorded for this ledge in the last 20 years. A brief revisit by boat on July 30 by BH revealed about 18 adult common terns on and around the island. Uncertain of productivity for island.

French Island Ledge (55-268, 55-269, 55-270):

Surveyed June 14 by boat, no terns seen. No terns on these ledges for the past 18 years.

Sister Island Ledge (55-237):

Survey on June 14 by boat revealed 1 pair of common terns with one of them appearing to be on a nest. No terns were observed nesting here last year but there was one nest in 2000. A brief revisit by boat on July 30 by BH revealed about 14 adult common terns on and around the island. Another brief visit by boat on August 4 revealed 20 adult common terns and 3 fledged common terns standing on a rock with one adult attempting feeding. Uncertain whether these 3 were from the nest on this ledge. Uncertain of productivity for island.

Grassy Ledge, Harpswell (55-259):

Nest survey by ground on June 14 revealed 2 eider nests, no terns. No terns on this ledge since 1995.

Black Rock (55-252):

Surveyed June 14 by boat, no terns seen. No terns on this ledge for 20+ years.

Outer Green Island - Matthew D. Martinkovic, Island Supervisor

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

Common Tern (*Sterna hirundo*) decoys and recordings were set up on the south end May 2nd. The first pair of Common Terns (*S. hirundo*) landed on the island on May 12th. The first egg was found June 9th near base camp. This was the first nesting pair on the island in 88 years.

Census: June 18th

<u>Species</u>	<u># Nests</u>	<u>#eggs/ clutch</u>
COTE	1	3
COTE	11	2.3

Most activity occurred after the GOMSWG census window. The late birds nested from June 26th through July 18th. Ten more nests were found during this time span. The average clutch size was 2.3 eggs per nest.

Tern Productivity - The mean hatch for the island was 1.0 chicks/nest. The number of fledgers per nest was .45. The number could be lower because of the time of departure. There were still eggs that did not hatch yet. On the day of closing there were two eggs ready to hatch. Also there were 6 chicks that were close to the 15 day fledger date.

Feeding Study - Due to the location of the nests on the island the feeding study protocol was changed.

The nests were observed from a farther distance and only the prey item size and type was observed. During the 6 hours of observations there was a wide variety of prey items. The prey items include White Hake, Herring, Pollock and Lumpfish.

Gull Control – Herring (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*) were the predominate species on the island in the beginning of the season. Double-crested Cormorants (*Phalacrocorax auritus*) and Common Eiders (*Somateria mollissima*) were predated shortly after arrival to the island. All gulls were discouraged from nesting with the use of pyrotechnics and lethal techniques. There was 164 HERG and 79 GBBG nests destroyed through out the season. Also there were 6 HERG and 5 GBBG shot this season.

<u>Species</u>	<u>Gulls Shot</u>	<u>Nests Destroyed</u>
HERG	6	164
GBBG	5	79

Other Island Notes: Through the season there was 117 different species of birds seen on or from the island. This island turned out to be a major migration stop for song birds. The highlight of the migration was a Yellow Throated Warbler (*Dendroica dominica*) seen in the month of May.

Jenny Island – Jaap and Heather Eijzenga, Supervisors, National Audubon Society

In 2002 Jenny Island was managed as a satellite of Pond Island NWR. A permanent camp was not established this year as a result of heavy predation events in 1999 and 2000. Audubon wardens visited the island 23 days including 5 overnight stays, for a total of 113.25 hours. The island was opened on June 4th and closed on August 6th. Research activities were mainly focused on predator management and the response of Common Terns (*Sterna Hirundo*) to predation.

Census:

The annual GOMSWG census was completed on June 18th revealing a total of 397 Common Tern nests. The Lincoln Index was calculated to be 1.0, so no adjustment was necessary. This is an unexpected increase from last year’s census total of 59.

Table 1: GOMSWG census results 1998-2002

Year	Adjusted count
1998	1167
1999	1129
2000	1050
2001	59
2002	397

Productivity:

A total of 36 nests were followed in productivity and feeding study plots to estimate overall productivity. These nests had an average clutch size of 2.53 eggs/clutch (SD= 0.61), and had an average hatching success of 1.44 eggs/nest (SD= 1.21). A total of only 10 chicks survived to fledging age, resulting in an average fledging success of 0.28 chicks/nest (SD= 0.51). Low productivity was once again the result of heavy predation throughout the season. Table 2 shows a comparison of productivity over the past 5 years.

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Table 2: Productivity 1998-2002 (Standard deviation in parentheses)

Year	Ave Clutch Size	Hatching Success	Fledging success
1998	--	--	1.57
1999	--	--	1.35
2000	--	--	0.015
2001	2.47(0.59)	--	0.07(0.26)
2002	2.53(0.61)	1.44(1.21)	0.28(0.51)

Predation:

Predators were anticipated in the 2002 season, so it was no surprise to discover mammal tracks and depredated eggs upon the crew's first visit to the island June 6th. Leghold traps were set on June 8th and a skunk was trapped and removed from the island June 10th. However, a visit on June 24th revealed widespread abandonment and depredated/missing eggs and chicks. It was not until June 20th that mink caches were discovered. Again, leghold traps were set and a mink was caught and removed on June 26th.

Pond Island National Wildlife Refuge – Jaap and Heather Eijzenga, Supervisors, NAS

Introduction:

Pond Island National Wildlife Refuge's seventh field season began on May 12th with the installation of social attraction equipment. Audubon wardens resided on the island from May 23rd to August 10th. Research activities focused primarily on predator management and the response of Common Terns (*Sterna hirundo*) to restoration techniques.

Census:

On June 19th Jaap and Heather Eijzenga, Sarah Case and Walter Gamble completed the annual GOMSWG census. A total of 109 nests were recorded, which is a slight decrease from last year (Table 1). However, there was a high prevalence of late nesting terns and an unofficial census of this effort on July 17th revealed 98 additional nests.

Table 1: Nesting Effort 1999-2002

Year	GOMSWG nests	Post-GOMSWG nests	Total
1999	11	11	22
2000	33	21	54
2001	135	20	155
2002	109	98	207

COTE productivity - It is exciting to note that 2002 holds the highest productivity record on Pond. A total of 40 nests containing 112 eggs were followed to estimate colony success. Of these eggs 97 hatched for a rate of 2.43 egg/nest and 62 chicks fledged for a rate of 1.55 chicks/pair. Table 2 compares these results from the years 1999-2001.

Table 2: COTE Productivity 1999-2002 (Standard deviation in parenthesis)

Year	Ave Clutch Size	Hatching Success	Fledging success
1999	2.18(0.67)	0.91	0.73(0.86)
2000	2.40(0.81)	0.91(1.22)	0.24(0.72)
2001	2.8(0.63)	1.74(1.24)	0.44(0.91)
2002	2.8(0.41)	2.43(0.85)	1.55(1.18)

Feeding Studies:

Feeding studies were carried out on 23 nests in three locations for a total of 143 observation hours. As in the past, Sand Launce was the predominate food this year followed by Atlantic Herring (Table 3).

Table 3: Prey Item Abundance for 2002

Prey Species	Number	Average Size	% Total Deliveries	% Known Deliveries
Sand Launce	1410	1.5	62.0	68.9
Herring	405	1.6	17.8	19.8
Hake	102	1.4	4.5	5.0
Sand Shrimp	57	1.0	2.5	2.8
Other	73	1.1	3.2	3.6
Unknown	229	--	10.1	--

Predation:

Predatory Great Horned Owls (*Bubo virginianus*) have threatened colony success since initiation of the project in 1996. This was again the case in 2002. On June 25th an owl was confirmed to be hunting on the island by the presence of three tern feather spreads. That night it was observed on the island and shot. A second owl was confirmed to be hunting on the North end of the island on July 17th. Its location did not permit shooting, so trapping was intensified. Leghold traps, mistnets, and a pole laden with nooses were all used for a total of 4,428.5 trapping hours, without success. It is estimated that the first owl killed five adult terns and the second killed 15 tern chicks.

Common Eider - A random sample of 40 Common Eider (*Somateria mollissima*) nests was marked and followed to estimate productivity. These nests contained a total of 174 eggs for an average clutch size of 4.35 eggs/nest (standard deviation 1.29). Results show 71% hatched, 5.2% were depredated, 4% were abandoned, and 19.5% held unknown outcomes. During peak eider hatch, gull numbers increased and a group of Common Ravens (*Corvus corax*) frequented the island to depredate eggs and ducklings.

Other island notes - The largest factor hindering tern productivity this season was the occurrence of what is thought to be a disease. As a result, 24% of chicks died accounting for 66% of total chick death. Both eggs and chicks were collected for testing.

On May 28th a Scissor-tailed flycatcher (*Tyrannus forficatus*) was observed on the island.

Eastern Egg Rock - Ellen Peterson, Island Supervisor, Puffin Project

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:

Before the GOMSWG census we located and flagged all of the Arctic Tern (*Sterna paradisaea*) and Roseate Tern (*Sterna dougallii*) nests on the island by observing nesting pairs, so that species differentiation during census was unnecessary. The nest count census was conducted from the 16th thru the 19th of June. We censused Common Tern (*Sterna hirundo*), Laughing Gull (*Larus atricilla*), and Common Eider (*Somateria mollissima*) nests. COTE numbered 1003 after the

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Lincoln adjustment (1.039), down by a third from last year. There were 81 ARTE nests, down by 11 nests from last year. The ROST nests are 160, up from last year's decline.

Table 1: Census Numbers, Nesting Pairs 1995-2002

Year	COTE	ARTE	ROST	LAGU
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-two COTE nests, 26 ARTE nests and 26 ROST nests were monitored for productivity this year. The productivity for all species was higher this year than last year, even though we had some early storms and gull predation throughout the season. In particular The ARTE productivity of 1.2 is the highest it's ever been. A persistent and strong storm on the 12th and another on the 15th of June, right before hatch, washed out hundreds of COTE and ARTE nests on the East side. Although HERG and GBBG were not observed predated much this season, the gull disturbance to the colony climaxed at the beginning of July the gulls were flying low and landing in the colony every half hour throughout the day and there was one nocturnal gull predator.

Table 2: Tern Productivity 1996-2002

Year	COTE	ARTE	ROST
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
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 6 ROST nests were monitored for the chick provisioning study. These nests represented the productivity and survival rates of their species well. The prey delivery percentages for each species are summarized in Table 3.

Table 3: Prey Item Percentages observed in Tern Feeding Study

Species	Hake	Herring	Invertebrate	Other	Unknown Fish	Unknown
COTE	34.13	9.61	15.43	7.72	29.16	3.95
ARTE	38.95	2.25	14.23	6.17	32.96	5.24
ROST	33.62	13.36	0.43	7.33	41.81	3.45

Laughing Gulls - The south end of Eastern Egg Rock was essentially gull-free this season. We poked the eggs of 443 laughing gull nests creating a buffer zone around most of the tern-nesting habitat of the south end and a section on the western edge. Most of the LAGUs did not re-nest because the eggs were close to hatch. An enclosed productivity plot was set up for LAGU monitoring, however no LAGU pairs set up nests inside.

Atlantic Puffins - Last year's record high of 37 breeding pairs on EER was shattered this year by the discovery of 12 new burrows. We had a total of 53 breeding pairs. ATPU productivity was 0.92 for the burrows that could be watched for a full 21 days of feedings. We were able to grub and band one chick and trap 10 adults.

Other Notes – There were 35 Razorbill sightings this year on Eastern Egg Rock. Often the Razorbills were seen in pairs wheeling over the island. We added two RAZO decoys to the southwestern boulder berm. A RAZO was seen landing on the island at least twice this season. Seventeen sightings of Common Murres were recorded. COMUs landed in the inter-tidal zone twice. We saw the Manx Shearwater only 5 times.

Matinicus Rock - Paula Shannon, Island Supervisor and Jen Nagy, Resident Intern, National Audubon Society

Census:

We conducted the tern and Laughing Gull nest census on 18-20 June. The total (unadjusted) tern nest count was 1,184 (1,088 nests counted plus 96 Arctic Tern productivity and feeding study nests). To determine species ratio, a direct count of Common Tern nests was conducted, yielding 198 COTE nests. COTE nests were subtracted from the 1,088 nests counted, leaving 890 ARTE nests. The Lincoln Index was applied to ARTE nests only, then the 96 ARTE productivity and feeding study nests were added, yielding an adjusted total of 999 ARTE nests. Thus the species ratio was 198 COTE/999ARTE. The total adjusted nest count was 1,197, which is similar to last year's estimate of 1,161.

We counted 624 Laughing Gull nests during the census, which is a 49.6% increase over last year's count of 417 nests. Population estimates for Arctic Terns, Common Terns, and Laughing Gulls since 1997 are shown in Table 1.

Table 1. Estimated number of breeding pairs of Arctic Terns, Common Terns, and Laughing Gulls at Matinicus Rock from 1997 to 2002.

Year	Arctic Terns	Common Terns	Laughing Gulls
1997	934	90	322
1998	791	97	343
1999	968	102	367
2000	1030	176	355
2001	1014	147	417
2002	999	198	624

Tern Productivity - We followed 72 Arctic Tern nests and calculated productivity at 1.31 chicks/nest. This is higher than the productivity in the past five years, which ranged from 0.43 to 1.06 chicks/nest. This was the first year we calculated productivity of Common Terns on the island. We followed 27 nests and calculated productivity at 1.22 chicks/nest. One bad storm occurred on 15 June, but it seemed to have no effect on the nesting terns. The high productivity for both tern species is probably related to an abundance of food, low predation, good weather, and lack of disease.

Predator Observations and Control - There was no widespread tern egg or chick depredation this year. Large gull control efforts this year included the destruction of 12 Herring Gull nests, three Herring Gulls (two with broken wings and one that seemed sick and did not fly) and one Great Black-backed

Gull with a broken wing. Despite the increase in nesting Laughing Gulls this year, we did not observe an increase in LAGU predation on tern chicks.

Tern Feeding Studies - We observed feedings at 30 Arctic Tern nests this year, with 240 hours of observation (observing six nests at a time). The diet composition of Arctic Terns is shown in Table 2.

Table 2. Prey items fed to Arctic Tern chicks, at Matinicus Rock, 2002.

Prey item	Total items	Percent of diet
Hake (white hake and small 4-bearded rockling)	908	46.45
Unknown fish	332	16.98
Euphasid	257	13.15
Herring	165	8.44
Amphipod	118	6.04
Unknown	112	5.73
Other fish	50	2.56
Other invert	13	0.66

Atlantic Puffins - We estimated puffin productivity this year by following the first 30 nests at which we saw feedings. Twenty-five of the 30 nests we monitored were successful (with the chick being fed for at least 21 days), yielding a productivity estimate of 0.83. We also banded 82 puffin chicks and re-banded 4 adults.

Razorbills - We conducted a Razorbill nest survey on 27-29 May, and we found 168 nests with viable eggs and seven with dead or rolled eggs. We also found three new burrows with dead eggs later in the season. Two of these were in areas of the island where Razorbills have not been known to nest previously. We also estimated Razorbill hatching success by following 30 nests. Twenty-four of 30 eggs hatched, yielding a hatch rate of 80%.

Common Murres - We continued the Common Murre attraction program this year, and experimented by added a second decoy colony and moving the sound recordings to the new area. Despite the lack of sound, murres still visited the traditional colony more often than the new colony. However, this year more murres were observed away from the decoys than with them. Murres (up to 55) were observed daily loafing with Razorbills from mid-June through mid-July.

Leach's Storm Petrels - We estimated hatching success for Leach's Storm Petrels by following 18 burrows this year. Seventeen of the 18 eggs hatched, yielding a hatch rate of 94%.

Manx Shearwater - The Manx Shearwater was present again this year. The manx was observed flying around the south end of the island during the day through the first week of June, and then it was heard calling at night throughout the rest of the season. On 27 July we confirmed the presence of two Manx Shearwaters calling at night. The call of the second manx was lower pitched and slightly different than that of the first, leading us to believe that a male and a female were present.

We checked the manx burrow for activity in early and late July by placing toothpicks vertically in the soil in front of the burrow entrance. The toothpicks were knocked away each time, and when checking the toothpicks on 31 July, the manx was heard vocalizing from inside the burrow.

Seal Island National Wildlife Refuge - Christine Caurant, Supervisor and Shawn Devlin, Assistant Supervisor.

Census:

Our tern census was conducted on June 17th and 18th this year. Our unadjusted count was 2400 tern nests. After applying a Lincoln Index of 1.067 (n=96) to the sum of 2400 tern nests and 81 productivity nests, our adjusted total became 2642 tern nests. This is the highest total recorded ever at SINWR.

Table 1. Tern Population Census on SINWR 1998 to 2001

	2002	2001	2000	1999	1998
Total	2400	1933	1963	1931	1848
Correction Factor	1.067	1.027	1.067	1.02	1.07
Corrected Total (w/ productivity plots)	2642	2058	2095	1951	1973

The species ratio of 60% Common Terns and 40% Arctic Terns was determined by identifying 678 nests to species within a 30 m radius of six blinds, yielding an adjusted count of 1582 COTE and 1057 ARTE nests. The percentage of the colony represented by COTE increased by 2% from last year. No Laughing Gull nests were found on SINWR.

Table 2. Population Estimates by Species and Species Ratio SINWR

Species	2002	2001	2000	1999	1998
ARTE	1057 (40%)	860 (42%)	890 (42.5%)	1082 (53%)	979 (53%)
COTE	1582 (60%)	1197 (58%)	1205 (57.5%)	955 (47%)	868 (47%)

Tern Productivity - ARTE clutch size (1.84) and hatching success (1.57) were similar to years past, however fledging success (1.11) was over 1.00 for the first time since 1997.

Table 3. Mean clutch, hatch and fledge success for ARTE on SINWR

ARTE	2002	2001	2000	1999	1998
Mean clutch	1.84	1.86	1.87	1.83	1.83
Mean hatch	1.57	1.64	1.67	1.60	1.6
Mean fledge	1.11	0.95	0.95	0.9	0.9

COTE clutch size (2.11) was just below average for the past five years and hatching success (1.78) was the lowest in five years. Fledging success (1.09) was greater than 1.00 for the first time in the five years.

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Table 4. Mean clutch, hatch, and fledging success for COTE on SINWR

COTE	2002	2001	2000	1999	1998
Mean clutch	2.11	2.06	2.2	2.70	2.0
Mean hatch	1.78	1.94	1.94	2.43	1.8
Mean fledge	1.09	1	0.77	0.96	0.87

The increase in fledging success for both ARTE and COTE may be attributed to high prey availability and moderate temperatures during and post peak hatch (very few days reached over 80 degrees F).

ARTE feeding studies - We watched 20 nests at four study sites. Amphipods made up the majority of prey species due to the presence of at least one amphipod specialist in three out of four study sights.

Table 5. Principal prey items of ARTE feeding study

Prey Species	# of Feedings	% of Diet
Amphipod	596	36.17
Hake	324	19.66
Euphausid Shrimp	296	17.96
Unknown Fish	83	10.80

Atlantic Puffins - This season we had 181 active burrows, of which 38 were new. Our total for active burrows represents a 25% increase over last season and is the highest number since the commencement of social attraction work on SINWR in 1985. Productivity for the first 40 burrows was 100%, up 2% from last year. A total of 736.12 hours were spent on observations of puffins (either band resighting or feeding stints).

Table 6. Number of active ATPU burrows, SINWR, 1998-2001

	2002	2001	2000	1999	1998
Active ATPU Burrows	181	145	126	115	77

Predator Control/Gull Census - Great Black-backed Gulls and Herring Gulls (actual numbers unknown) made forays several times a day into the colony beginning about one week after peak hatch until just after peak fledge. Predation attempts continued less frequently until early August. Three GBBG (1 immature, 2 adult) and one HERG were shot upon viewing predations or attempts. Laughing Gulls, Merlin, and Peregrine Falcons were also observed removing tern chicks or eggs from the colony. Seventy-four HERG eggs and 155 GBBG eggs were destroyed during our gull census in late May. An additional 9 GBBG and 3 HERG nests were destroyed in late June.

Other Breeders - One Razorbill nest fledged one chick, and several RAZO were seen daily loafing and prospecting at the main puffin colony. Great and Double Crested Cormorants nested (18 and 15 nests respectively) on the western edge of SINWR, while Common Eider and Black Guillemots nested over large portions of the island.

Visitors/Rare Birds/Student Research - Three groups of visitors frequented SINWR during the last two weeks of July. Other rare birds included a Summer Tanager, a Sharp-Shinned Hawk, and a female Northern Harrier. Two student research projects were conducted, in part, on SINWR. Margaret Harper collected abandoned COTE eggs for contaminant examination and Shawn Devlin collected Periwinkles for analysis of shell size variation on islands and on shore in the Gulf of Maine.

Metinic Island - Megan Brown, Supervisor, USFWS

Census - During the 2002 season a total of 244 Common and Arctic Terns nested on Metinic Island during the GOMSWG census window, this survey was completed on June 20th. With a Lincoln index correction factor applied to the densest portion of the colony, the population size became a total of 251 nesting pairs of terns. The species ratio was: 104/230 Arctic Terns and 126/230 Common Terns to give a ratio of 45% nesting Arctic Terns and 55% nesting Common Terns. To generate this known sample size, all nests were identified by species during blind stints and marked with a color-coded flag to represent the species; all but 14 nests were identified to species. The population size of 244 nesting terns on Metinic Island greatly improved as compared to the 2001 population size of 109 nesting terns during the GOMSWG census window.

Table 1. Tern nesting totals for the north end of Metinic Island, 1984-2002

Season	Total Nests	Before GOMSWG	After GOMSWG
1984	600	N/A	N/A
1996	34	33	1
1997	17	4	13
1998	0	0	0
1999	14	3	11
2000	108	74	34
2001	132	111	21
2002	343	244	99

Productivity - Tern productivity was high during the 2002 season on Metinic Island. Terns experienced record productivity as compared to past seasons, perhaps because of plentiful food resources available, a relatively stable climate, and a healthier population size. As compared to the 2001 season, productivity slightly decreased for Arctic Terns from 1.53 chicks fledged per pair (in GOMSWG census window) to 1.37, and increased for Common Terns from 1.18 chicks fledged per pair to 2.29 during the 2002 season.

Table 2. Arctic and Common Tern productivity values, Metinic Island 2002

<u>Productivity Measure</u>	<u>Arctic Terns</u>	<u>Common Terns</u>
average clutch size	1.89 +/- .315	2.73 +/- .594
average hatch/nest success	94.44%	92.68%
average fledging success (hatched chicks surviving to 15 days)	76.47%	89.47%
average fledging success (hatched chicks surviving to end of season)	76.47%	81.58%
average reproductive success (chicks surviving to 15 days)	72.22%	82.93%
average reproductive success (chicks surviving to end of season)	72.22%	75.61%
# of chicks fledged/nest (chicks surviving to 15 days)	1.37 +/- .684	2.29 +/- .468
# of chicks fledged/nest (chicks surviving to end of season)	1.37 +/- .684	2.07 +/- .62

Provisioning - There was a total of 21 nests observed for provisioning during the 2002 season on Metinic Island. A total of 118.25 hours were spent in provisioning stints and a total of 962 feedings were witnessed. There was on average 1.409 +/- 1.19 feedings per hour during these provisioning stints.

Table 3. Percentage and mean length of food items delivered to Arctic, Common Tern chicks in units of adult bill length

<u>Prey Item</u>	<u>% of Total</u>	<u>Mean Length</u>
Hake	58.90%	1.49 +/- .33
Herring	10.90%	1.95 +/- .46
Invert	13.40%	.25 +/- 0.00
Polluck	0.52%	1.25 +/- .50
Butterfish	0.52%	1.85 +/- .14
Sandlance	0.42%	1.38 +/- .65
Sculpin	0.21%	2.25 +/- .35
Unknown	15.10%	*no measurments taken

Predator Activities - In the 2002 field season gull control entailed culling a total of four gulls: three adult Herring Gulls and one Great Black-backed Gull. Two (one Herring and one Great Black-backed) gulls were culled because of broken wing injuries and two adult Herring Gulls because of being problem predatory gulls. A total of six Herring Gull nests were destroyed in the five acre “gull free” zone, and a total of 167 Herring Gull nests and three Great Black-backed Gull nests were poked on the northern peninsula to dissuade gull nesting. There were 13 incidents of Herring Gulls depredating tern chicks from the three main colonies, and zero by Great Black-backed Gulls. A female adult Merlin frequented the northern peninsula of Metinic Island and on five successful attempts depredated tern fledglings; however, it is speculated that the Merlin was more successful then seen because tern chick remains were often found in the colony. The Merlin is believed to have a nest in the forested section of the island and visited the tern colony several times daily from the end of June until the end of the season. In all instances of predatory behavior from gulls and the Merlin, as well as an occasional fly over by a Bald Eagle the terns reacted with mobbing behavior.

Other Monitoring Activities - With the cooperation of the Maine Department of Inland fisheries and Wildlife, a total of 108 nesting female Eiders were banded on Metinic in 2002. In future seasons, Eiders will be banded and recaptured to estimate population and productivity success. This year marked the first research practices for this project. A total of 96 Eider crèches were counted through out the season with an average of 10.44 +/- 7.38 ducklings per crèche. An Eider duckling census was also completed at the end of the season around the perimeter of USFWS land and a total of 147 ducklings were counted; 36 class one ducklings, 34 class two ducklings, and 77 class three ducklings.

A total of 22 active Black Guillemot burrows were located and 12 Black Guillemot chicks were banded with federal bands in the 2002 season.

Island Notes - On June 10th a Roseate Tern was spotted loafing near the intertidal zone with a group of Common Terns. Metinic was also home to many other unique birds including nesting Ospreys, Leach’s Storm Petrels, Merlins, and Ring-necked Pheasants. Island visitors included photographers from the USFWS refuge centennial, and the Friends of Petit Manan group.

Penobscot and Jericho Bay - John Drury - Working with a grant from the Maine Department of Inland Fisheries and Wildlife.

Wooden Ball:

7 Arctic Tern nests found June 17, widely scattered, 6 with 2 eggs and 1 with 1 egg. There were still adults present mid-July, suggesting some success, no fledglings were seen.

Little Green:

June 18, 4 adult Arctic Terns west of the landing, 3 nests with 2 eggs found. There were no terns at this site July 16. 19 nests found on the east beach, 30 adult Arctic Terns no common seen, 2 nests with 1 egg, 15 nests with two eggs, 2 nests with 3 eggs and 1 nest with 4 eggs. Common terns had nested last year apparently some of those birds showed up here early and decided to go elsewhere. Total 22 nests. 3 fledglings were seen and there were 30 adults seen on July 16.

Hog Island:

June 18, 10 nests on the west side 20 adult Arctic Terns attending. 1 nest with one egg, 8 nests with two eggs and 1 nest with three eggs. One nest with 2 eggs found on the east side. Total 11.

Metinic, South end:

Hog island facing beach one nest with two eggs one adult arctic tern. SE tip 20 adult 12 nests found, 20 adult Terns Some common, @2-3 pairs. 1 nest with one egg, 7 nests with two eggs and 4 nests with three eggs. SW tip 3 adult Arctic Terns 1 nest with one egg, and 1 nest with two eggs. Total 15.

Little Two Bush:

June 18, 20 adult Terns, mostly Common a couple of Arctic. 8 nests found, 6 nests with one egg, 1 nest with two eggs, and 1 nest with three eggs, 5 scrapes seen they were still setting up here. July 16, 7 Common Tern present but no sign of activity in the nesting area, no sign of chicks.

Western Cowpen:

June 19, 20 adult Common Terns, 10 nests found. 2 nests with one egg, 2 nests with two eggs and 6 nests with three eggs. The birds seemed half spooked there were cold clutches. July 13, no terns present.

Eastern Cowpen:

June 19, 100 adult common Terns, Total. 67 nests found, 8 nests with one egg, 31 nests with 2 eggs and 28 nests with three eggs. July 13 there were no Terns present.

Dry Money Ledge:

90 common Terns. 59 nests found. 14 nests with one egg, 30 nests with 2 eggs, 15 nests with three eggs. 25 nests empty but used. 3 broken eggs. There is trouble here, a pair of Black backs came in hunting, and they seemed to be familiar to the Terns who attacked them. There were no Terns present July 13.

Southern Popplestone Ledge:

0 terns June 19. A pair of Common Terns defending territory July 13.

Islands where no Terns were seen:

Spirit ledge, Great Spoon, Little Spoon, Saddleback, Three bush, Gooseberry, Mason ledge, Brimstone*, John's Island, Western Green Island, Eastern Green Island, Harbor Island Knob, Green Island Knob, Green Island. High Sheriff, Halibut Rocks, Three Bush, Southern Mark. Green ledge (Fog Island), Green Ledge (east of Vinalhaven), Large Green, No man's land, Two Bush (Matinicus), White horse, Black Horse,

*None during census but there were 60 Common terns roosting July 13.

Great Cormorants - There were a total of 192 Great Cormorant nests counted this summer in Penobscot and Jericho bays: 21 at Little Roberts, 32 on the SE shore of Little Spoon, 12 on the NW corner of Little Spoon, 33 on Great Spoon Spit, 23 on Brimstone, 44 on Green ledge and 27 on Seal Island.

There were 171 Great Cormorant nests found in 2001 and 136 in 2000. After 7 years of decline, there has been a considerable gain in the number of Great Cormorant nests found during the last two years.

Guillemots on the Islands SE of Vinalhaven - A brief inspection of some of the nesting areas on Carvers and Otter islands August 16 indicated continued good success amongst the Guillemots there. Mink did not kill most of them this year.

A brief discussion of some issues - We should not frame our discussion as an overview of seabird restoration, as that puts the emphasis on what people are doing. We should begin with an overview of recent changes in seabird populations, what the birds are doing.

In June, I received word that the annual Seal Island field trip for the Vinalhaven eighth grade was prohibited by the Petit Manan refuge because of concerns of the dangers of unexploded bombs on the island. I think that this not a tenable decision. The trip has been a simple means of connecting local youth with the island and the wildlife there. Prohibiting the trip to please lawyers is silly.

People have been living ashore on Seal Island every summer for almost twenty years. The threat of unexploded bombs is not particularly credible. Driving down Route 1 is far more dangerous than walking around Seal Island is ever going to be. The same refuge gave permission for American captains to land loads of people on a Canadian island, Machias Seal, after the Canadians wanted to close the island because of fear of liability.

A load of contributors to the Puffin project were landed on the island in July, so apparently wealthy folk from away are welcome where local youth are not. How much does the Vinalhaven eighth grade have to give the Puffin project before they can visit the island that is part of the town of Vinalhaven?

We have discussed a year of observing an island targeted for gull removal before gull harassment began. This did not happen at Outer Green Island. By clearing the gulls off, a commitment is being made for a long occupation spending a year studying what is going on before gull unrestoration is necessary for us to better document what effect the gull destruction has. Until such time as recourses are found to pay researchers on Seal Island and Matinicus Rock a living wage, it is premature to start other long-term commitments on other islands.

It is inappropriate for the Audubon Society to apply for a building permit on outer Green Island after families who have owned islands for generations and have seen Terns come and go are denied the right to add on to a camp because of records of terns breeding on the island. Who is going to disturb the

birds more than Seabird scientists? Nobody - unless they are actively harvesting the birds. Much effort has been made in the conservation community in Maine to keep houses off barren islands. A good tent will suffice.

An article came in the Egg Rock update annual report of the Puffin Project, in which it was stated that there were no puffins breeding below the Canadian border in 1973. This goes to people who have contributed time or money to the project many of whom don't know that there were, in fact, thousands of puffins nesting in the Gulf of Maine and that the success of the project was due, in no small part, to the efforts of these birds. Good information is more valuable than good press. We're trying to accurately document and report what's going on out there.

There are times when leaving the birds alone is the best course of action. The arrival of a single Manx shearwater interested in nesting 800 miles from the closest known breeding ground is certainly such a case. There has been persistent unnecessary disturbance of the pioneer Manx Shearwater on Matinicus Rock. Putting tooth picks at the mouth of the burrow will teach us nothing that is worth risking scaring this bird off, but exposes the site to trampling by people. A mate may have been scared off already, who knows? "burrows may collapse and incubating shearwaters may desert after inspection of shafts by researchers. More frequent nest inspections result in greater likelihood of abandonment" (Thompson '87 "Ecology of Manx Shearwaters on Rhum Island West Scotland") and this at Rhum Island, where thousands of Manx have nested for thousands of years, there is no culture or history tying this bird to this island. More could be learned from a regular program of remote observation than from toothpicks. Risking scaring this bird off is a sin, he may be out there for decades a magnet for youthful wandering Manx.

East Penobscot Bay - Brad Allen, Maine Inland Fish and Wildlife

On 21 June 2002, we checked 8 islands that historically had some level of Common Tern nesting in the recent past in East Pen Bay. No terns were recorded on Dagger Island, Thrumcap Island, Spectacle Island, and Grass Ledge (west). We recorded nest estimates from the boat for Common Terns on Eaton Island Ledge (2 pairs) and Colthead Island (3 pairs) but did not do ashore because of the presence of nesting Great Black-backed Gulls. We conducted nest counts on the following two island, with nest counts recorded in parentheses: Buck Island (41 COTE) and Hardhead Island (20 COTE). The presence of "fledgers" was also noted on both of these islands.

Petit Manan Island – Sarah Jamieson, Atlantic Cooperative Wildlife Ecology Research Network

During the summer of 2002 there were between 2757 and 2885 pairs of seabirds nesting on Petit Manan Island (990 Common Terns *Sterna hirundo*, 838-966 Laughing Gulls *Larus atricilla*, 671 Arctic Terns *Sterna paradisaea*, 113 Common Eiders *Somateria mollissima*, 98 Black Guillemots *Cephus grylle*, 27 Roseate Terns *Sterna dougallii* and 20 Atlantic Puffins *Fratercula artica*). One hundred and one bird species were seen on or near Petit Manan Island or Green Islands.

Terns had high reproductive success this summer. Arctic Terns fledged 1.41 chicks per nest (n=27, SD= 0.36), Common Terns fledged 1.57 chicks per nest (n=7, SD 0.79) and Roseate Terns 0.72 chicks per nest (n=25, SD= 0.61). Each species fledgling rates were higher than they had last season. Herring made up 50% of the prey species fed to tern chicks.

Six hundred and fifty six chicks were banded this summer (331 Common Terns, 229 Arctic Terns, 68 Black Guillemots, eighteen Roseate Terns, and ten Atlantic Puffins). In addition to this 58 adults were banded as well (47 Arctic Terns, five Common Terns, four Black Guillemots, and two Atlantic Puffins). The number of bands read during the summer of 2002 was 240 (118 Arctic Terns, 82 Atlantic Puffins, 31 Common Terns and 9 Roseate Terns).

Machias Seal Island - *Kate Devlin, ACWERN, University of New Brunswick*

Two Canadian Wildlife Service employees (Andrew MacFarlane, and Andrew Kennedy) joined the ACWERN research crew (Kate Devlin, Amie Black and Sarah Dauncey), the CWS island observer (Chris Novak) and 2 lighthouse keepers (Russell Ross and Ralph Eldridge) for the biannual island wide tern nest count on 13-14 June. Results of the census are being written up by Andrew MacFarlane and Andrew Kennedy and were unavailable at the time of this report. The ACWERN crew and CWS island observer determined the species ratio by the identification of 2253 nests (38% Common and 62% Arctic Terns). The number of nesting Common Terns has continued to increase on the island (Table 1).

Tern Productivity - The first tern egg was found on 26 May. Peak egg laying for Arctic Terns was 2 June and for Common Terns was 6 June. The first tern chick was found on 18 June. Peak hatching of these nests was 25 June for Arctic Terns and 29 June for Common Terns. The peak of egg laying and hatching was about a week earlier than observed in 2000 and 2001. Productivity of the first wave of nesting was average when compared to the last 5 years (Table 2). There was a second wave of nesting (by both Arctic and Common Terns) after 13 June and we followed a sample of these nests for productivity (Table 3). Productivity of the late nests was low and many of these eggs were abandoned before hatching. The relatively low overall fledging success observed this year may be attributable to a diet of primarily euphasid shrimp in the early part of the season. Several nests were destroyed by Herring and Great Black Backed Gulls at the northern end of the colony. We had no firearm on the island as in 2000 and 2001 (due to legalities) and a noise maker/cap gun was used to scare gulls away from the colony on a regular basis. No Herring or Great Black Backed Gull nests were observed on MSI this year.

Atlantic Puffins - Peak egg laying for Atlantic Puffins was 16 May and was 2 days earlier than last year. The first puffin carrying fish was observed on 11 June and the first fledgling puffin chick was collected at the light- house on 19 July. The puffins fed predominantly on euphasid shrimp in the early part of the season; however most switched to herring after the second week of July. The fledglings captured so far are a mix of small light puffin chicks (240-270g - similar in size to the ones captured in 2000 when the diet was predominantly euphasid shrimp) and large heavy puffin chicks (300-340 g) that appear to have had a better diet.

Razorbills - Peak egg laying for Razorbills was 19 May and was 4 days earlier than 2001, but close to the peak of egg laying observed in 1998, 1999, and 2000. The first Razorbill carrying fish was observed on 16 June. The first Razorbill chick to fledge was recorded on 24 June; however, the peak of Razorbill chick fledging was 7 July. Razorbill productivity was higher than has been observed in the last 5 years (Table 2) and may be due to the dominance of herring in the diet of the chicks this year.

Feeding observations:

Euphasid shrimp was the dominant food item observed for Arctic and Common Terns and Puffins. However, Razorbills brought in a higher proportion of herring than any other prey items. See Table 4.

Other items of note - One laughing gull nest was located on 9 July and one chick hatched on 1 August. Up to 10 laughing gulls were observed on the island at any one time, however, there were usually only 2-4 on the island on a regular basis. There was another increase in Common Murre activity on the island. Common Murres were observed investigating rock crevices and boulders in several locations. Common Murres carrying fish were observed on six occasions; however, upon closer investigation, no eggs or chicks were found. It seems that the birds were acting as if they were in a pair and may have had an egg or a chick, but then their excitement turned out to be over a small rock or crack in the rocks. The Common Murres also appeared to be attracted to Razorbills incubating and some razorbill chicks (which were defended by adult Razorbills). Two Black Terns observed regularly on the island throughout the season, occasionally the Black Terns were observed carrying insects. No nest was located, however in July what appeared to be a Black Tern Fledgling was observed on three occasions. Lastly a white puffin was observed in the waters around the island in June and July. It appeared to have a normally coloured bill and legs. According to the boat captains who were able to closely approach the bird there was a small grey spot under one of the wings. The white puffin was never observed on land but was seen frequently on the water with other normally coloured puffins. Fishermen also reported seeing a white puffin in the waters around Campobello island on a few occasions. We last saw the white puffin in early July.

Table 1. 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)
2002	**	38 %	62 %

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

** Data will be supplied as soon as it is available.

Table 2. A summary of breeding success of Common and Arctic Terns, Puffins and Razorbills nesting on Machias Seal Island between 1995 and 2002. Mean (SD) clutch size, number of hatchlings and fledgling per nest are listed.

Species	Year	n	Clutch Size	Hatching Success	Chicks/nest	Chicks/nest	Fledglings/nest*
					Alive at Day 15	Alive at Day 20	
Common Tern	1998	28	1.77 (0.617)	1.42 (0.848)	0.61 (0.685)	0.43 (0.573)	0.39 (0.497)
	1999	26	2.46 (0.582)	2.12 (0.816)	1.31 (0.618)	1.23 (0.652)	1.23 (0.652)
	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	57	1.95 (0.479)	1.36 (0.819)	0.77 (0.614)	0.70 (0.638)	0.70 (0.638)

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Arctic Tern	1998	41	1.80 (0.401)	1.34 (0.728)	0.68 (0.521)	0.41 (0.499)	0.41 (0.499)
	1999	32	1.81 (0.397)	1.28 (0.851)	0.78 (0.706)	0.63 (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	130	1.61 (0.460)	0.99 (0.812)	0.55 (0.565)	0.51 (0.573)	0.51 (0.573)
Atlantic Puffin	1998	59	1	0.8 (0.37)	-	-	0.65 (0.482)
	1999	84	1	0.7 (0.46)	-	-	0.60 (0.494)
	2000	75	1	0.8 (0.42)	-	-	0.48 (0.503)
	2001	78	1	0.8 (0.40)	-	-	0.71 (0.458)
	2002	80	1	0.9 (0.30)	-	-	0.66 (0.479)
Razorbill	1998	49	1	0.9 (0.36)	-	-	0.50 (0.505)
	1999	60	1	0.8 (0.40)	-	-	0.60 (0.493)
	2000	71	1	0.7 (0.44)	-	-	0.62 (0.490)
	2001	62	1	0.8 (0.39)	-	-	0.65 (0.482)
	2002	57	1	0.9 (0.32)	-	-	0.83 (0.377)

* Fledglings/nest - Those tern chicks found dead after day 20 were subtracted from the number of chicks fledged.

Table 3. Productivity for late nesting Common and Arctic Terns in 2002.

Species	Year	n	Clutch Size	Hatching Success	Chicks/nest Alive at Day 15	Chicks/nest Alive at Day 20	Fledglings/nest*
Common Tern	2002	34	1.71 (0.68)	0.81 (0.85)	0.30 (0.47)	0.13 (0.34)	0.13 (0.34)
Arctic Tern	2002	42	1.33 (0.48)	0.83 (0.74)	0.62 (0.70)	0.48 (0.68)	0.48 (0.68)

Table 4. Observed prey items delivered to nests on Machias Seal Island in 2002.

	ARTE	COTE	ATPU	RAZO
Hours of Observation	70	60	68	49
Number of Nests	22*	32*	5-11**	4-5**
Nest Hours	328	267		
Identified items / Total	891/995 (89.5%)	444/473 (93.9%)	1435/1593 (90.1%)	210/230 (91.3%)
Percent of identified prey				
Herring	7.0%	19.1%	27.7%	61.4%
Hake / Rockling	1.9%	5.4%	13.4%	17.6%
Euphausiid	90.6%	74.1%	57.8%	3.8%
Butterfish	0.1%		0.6%	
Sandlance		0.7%	0.3%	16.7%
Pollock			0.1%	
Moths	0.1%	0.5%		
Other	0.3%			

* 4-6 nests observed per stint

**per observation site

Please note: a more detailed report of the season will be available on the internet in the fall. Last year's report can be viewed at: www.unb.ca/ACWERN/msi2001/msi2001.htm

Part 2 – NEW BUSINESS

Education – *Pete Salmansohn, National Audubon Society (psalmansohn@audubon.org)*

Thanks to funding from the Maine Department of Inland Fisheries and Wildlife and the Maine Outdoor Heritage Fund, we have purchased a video camera and installed it at Eastern Egg Rock, maintained by Seabird Sue (Susan Schubel). We piloted this program to use live-stream video primarily for terns and to teach young students (3rd to 6th grades) how to observe tern behaviors. We will be developing a web-based TV handbook and a student handbook.

Pete explained that this was just a part of the Seabird Educational Program that runs from September to June. We typically see about 2,000 students in Maine, which is comprised of about 30 schools. The strength of it is that we have series of visits to classrooms. We may return up 4 to 6 times to build up a curriculum that is based on seabird ecology and human effects on the marine ecosystem. We have a lot of cool activities and Sue gets very creative with costumes and craft projects.

We are continually looking for funds for scholarships to bring this type of education into the schools. There are several very poor school districts in Maine. If anyone knows of a Foundation, private individual, government agency, etc., who would be interested in furthering the Seabird Educational Program, please speak with Pete or Sue.

Puffin Cruises - *Pete Salmansohn, National Audubon Society*

We are doing 11 puffin cruises a week, from Boothbay Harbor (4/wk), and from New Harbor (7/wk). They all go to Eastern Egg Rock. It's a wonderful way to take "walk-on" tourists, who know very little to nothing about seabird conservation, keep them captive on an island, and fill them in on the message of seabird conservation. We take between 4,000 and 4,500 people a year on these tours. Since the cruises originated in the late 80s, we have reached over 40,000 people. The cruises are conducted from May until mid-late August, when the Puffins leave to go out to sea.

Saving Birds – Heroes Around the World - *by Pete Salmansohn and Steve Kress*

We have a new book that will be coming out late September or early October called, Saving Birds – Heroes Around the World. This is an Audubon children's book with 6 chapters of international projects that people are doing to help birds, from such places as Israel, Mexico, China, New Zealand, and California. It is illustrated with slides from all of the project sites.

Tern Handbook - *by Steve Kress and Scott Hall, National Audubon Society*

The new Tern Handbook is being duplicated at the USFWS in Hadley, Massachusetts and should be available shortly. It is a working project and hopefully, there will be future editions.

Part 3 – RESEARCH REVIEW PRESENTATIONS

SEABIRD ECOLOGICAL ASSESSMENT NETWORK (SEANET) - *Becky Harris, Ph.D., Tufts University, School of Veterinary Medicine, 200 Westboro Road, North Grafton, MA 01536-1895. (bharris@scientist.com)*

At the Tufts University School of Veterinary Medicine's Center for Conservation Medicine we are initiating the Seabird Ecological Assessment Network (SEANET). We hope to collaborate with seabird researchers in coastal New England and Atlantic Canada to form a cohesive network of researchers and citizen scientists, creating a database of seabird information and ultimately an on-going web-based reporting system. The project will support the collection and compilation of baseline data, including regular volunteer-based beached bird surveys that could provide information about mortality events and help prevent future risks. Topics of investigation include population estimates, demographics, habitat requirements, known disease outbreaks, cited mortality events, ecological threats, and anthropogenic threats, as well as seasonal, breeding, and migratory distribution patterns. Patterns of environmental contaminants found in the birds, including heavy metal and petroleum products, will be documented and pollutant source locations mapped. Additionally, a database of regional oil shipping and distribution patterns and previous oil spill locations will be incorporated into a GIS; seabird distribution, mortality, and contaminant maps will be overlaid. The gathered information will be disseminated and regular meetings of network participants will be convened in an effort to develop succinct regional plans for aquatic bird and habitat protection, prevent and prepare for future oil spills and mortality, and serve as an educational vehicle and catalyst for involvement of citizen scientists.

LEAST TERNS IN MAINE - *Jordan Perkins University of Maine, Dept. of Wildlife Ecology, 5755 Nutting Hall, Orono, ME 04469 (Jordan_Perkins@umit.maine.edu)*

A total of 235 nests were monitored in five colonies, located between the towns of Wells and Georgetown on the Maine coast. The fates of these nests were 54 % hatched, 26 % lost to high tides and waves, 5 % predated, 4 % abandoned, and 11 % had an unknown outcome or loss. A total of 258 chicks hatched from a minimum of 154 pairs. At two colonies, a total of 100 chicks were banded to determine survival rates of chicks and departure rates of fledglings. Approximately 75% of banded fledglings were resighted at least once after fledging (21 days after hatch). Approximately 110 fledglings were sighted statewide yielding an overall minimum productivity rate of 0.71 fledglings per pair. Predation of nests was attributed to fox, and possibly crow and chipmunk. A mid-June storm caused nearly all of the nest losses to waves. Most abandonment occurred towards the end of the nesting period. There was evidence of nocturnal disturbance by deer throughout the breeding season. We used data loggers, which recorded temperature at the nest, to monitor nocturnal nest attentiveness of incubating adults. These data are to be considered preliminary.

INTRA-SPECIFIC KLEPTOPARASITISM IN COMMON TERNS ON JENNY ISLAND - *C. Scott Hall, 41 Northport Ave., Belfast, ME 04915*

In 1996 and 1997 I followed kleptoparasitism events on Jenny Island, Casco Bay, Maine. Of 215 total events observed over both years, 31.6% were successful (success was defined as the transfer of prey from host to pursuer or causing the prey to drop). Successful events are characterized by larger prey

with more Common Terns (COTE) and Laughing Gulls (LAGU) chasing for longer periods. In 1996, 126 events were observed; 33.6% were successful. In 1997, 89 events were observed; 29.2% were successful. In 1996, success was higher and there were significantly more chases per hour than in 1997 - prey size was larger and more COTE and LAGU pursued for longer periods (only size and # LAGU significant). I speculate that increased kleptoparasitism activity in 1996 was due to a change in tern prey availability late in the breeding season - reflected in decreased feeding rates and an increase in butterflyfish prey deliveries to nests. Of 146 events when prey weren't stolen, 49.3% of the prey were eaten and retained 50.7% by the host tern. Prey that was eaten was significantly larger, with more COTE and LAGU chasing for longer periods.

HATCHING SUCCESS AND NEST SELECTION OF LAUGHING GULLS ON MATINICUS ROCK - Jennifer Nagy, Unity College and NAS

During this study, I attempted to determine if Laughing Gulls benefited from nesting in close proximity to terns or other nest selection factors. Hatching success of 53 Laughing Gull (*Larus atricilla*) nests was followed within the mixed seabird colony at Matinicus Rock, Maine. Groups of 12-15 nests were followed from laying to hatching in areas of differing vegetation and proximity to nesting Common and Arctic Terns (*Sterna hirundo* and *S. paradisaea*, respectively). Nests were quantified on surrounding vegetative cover based on type, percent cover, and height. It was hypothesized that higher hatching success with Laughing Gulls would correspond to higher nest density, higher percent vegetative cover, and closer proximity to Common and Arctic Terns. Results of this study are not yet known, but are to be deduced from a series of analysis of variance tests to determine which variable(s) influence the reproductive fitness for this species. Contact via jnagy@unity.edu for discussion or future results.

SURVIVAL AND RECRUITMENT OF COMMON EIDERS IN THE GULF OF MAINE – Brad Allen, MDIFW, 650 State Street, Bangor, ME 04401

Common eiders are a member of a diverse group of waterfowl known as sea ducks. Concern over the status of many species of sea ducks has increased worldwide in recent years. Compared to other waterfowl species, sea ducks (and here Common Eiders) are characterized by delayed sexual maturity, small clutch sizes, low rates of annual recruitment, and high survival of adults under normal conditions.

The *dresseri* race of the Common Eider breeds from central Labrador to southern Maine and winters from Newfoundland to Massachusetts. The low-point for eiders in Maine was 1907 when only two pairs were reported nesting. Recent data indicate that there may be as many as 29,000 pairs nesting at 321 sites in Maine. While there are a number of management concerns regarding this species, a major limiting factor for adult eiders is sport hunting. This burgeoning activity has experienced considerable growth in the last 15 years in the northeast. This study is necessary because no recent data on eider survival rates are available to make sound management decisions.

Partnering with the USGS and US Fish and Wildlife Service, the Maine Department of Inland Fisheries and Wildlife has begun a long-term banding effort to study eider survival rates and recruitment using standard mark-recapture and band recovery techniques. To date, eider banding has been conducted on Green Island/Petit Manan, Metinic Island, and on a sample of nesting islands in

East Penobscot Bay. This year's banding effort resulted in captures and banding of approximately 1,267 adult hen eiders, nearly 118 young-of-the-year ducklings, and over 756 adult males. For more information about this investigation, contact Brad Allen at 207-941-4469 or at brad.allen@state.me.us.

WHO TERNED UP? ARCTIC TERN METAPOPOPULATION PROJECT UPDATE - *Kate Devlin ACWERN and Dept. of Biology, University of New Brunswick, P.O. Box 45111, Fredericton, N.B. Canada E3B 6E1 (i65v9@unb.ca)*

Since 1999, ACWERN (University of New Brunswick), Project Puffin and the U.S. Fish and Wildlife Service have been collaborating on a metapopulation study of the Arctic Terns nesting in the Gulf of Maine and the Bay of Fundy. We have banded over 3500 terns and, as of 2001, re-encountered approximately 550 of these birds. Only three adult birds were banded on one island and found breeding on another island in a subsequent year. We have found more evidence of birds banded as chicks breeding on islands other than the island they hatched on. At the beginning of the 2002 season I challenged the staff working on the different islands involved in this project to re-sight as many terns as possible. We'll see who the winners are!