Gulf of Maine Seabird Working Group
August 9, 1999
Hog Island, Bremen, Maine

Compiled by: Petit Manan NWR

Steve Kress welcomed the group to the 14th summer meeting of the Gulf of Maine Seabird Working Group (GOMSWG). Steve briefly summarized the recovery of Laughing gulls and terns within the Gulf of Maine, between 1977- 1998 (see attachment). During this time period, we have observed the total number of nesting terns increase to 24,295 pairs at 76 nest sites. This represents a 132% increase in total pairs since 1977.

Note: We have defined the Gulf of Maine as the area between Cape Sable, Nova Scotia to Nantucket, Massachusetts.

MONOMOY ISLANDS
Reported by Stephanie Koch

I. North Monomoy

Census and Productivity: 52 COTE pairs were counted on 10 June (an increase from 11 pairs in 1998), but by 15 June, only ½ of the nests were still active. 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. Despite low productivity, a few nests did hatch. Productivity was not quantitatively measured.

II. South Monomoy

COTE:

Phenology (In general, about 2-3 days earlier than 1998 and 7-10 days earlier than 1997)
1st terns seen around the island - 1 May
1st scrapes - 14 May
1st eggs - 20 May
1st hatch - 13 June

Census: A total of 5433 COTE nests were counted on South Monomoy Island on 16 and 18 June. The Lincoln-Index boosted the total to 5478 total nests, an increase from 2363 in 1998. No B-count was conducted, but an additional 42 nests (25% of the original 168 nests) were initiated in productivity enclosures after the census window.

Productivity: determined using 168 (A-count only) nests in 24 fenced productivity enclosures.
Average clutch size: 2.41 eggs/nest (SD = 0.631, N = 168 nests) ***2.56 in 1998***

Hatching success: 2.06 eggs/nest (SD = 0.873, N = 168 nests) *2.27 in 1998*
Reproductive success: 1.60 chicks/nest (SD = 0.821, N=168 nests) *1.83 in 1998*

In addition to monitoring productivity, all chicks in productivity plots were weighed on days 0, 1, and 2, and then every third day until fledging or no longer found. Data has not yet been analyzed.

Twenty-six of the nests in the productivity plots were also used to determine prey types and size of prey provided to chicks until they were fledged. **Preliminary results follow.** Observers spent 167 hours watching feeding nests, or a total of 681.5 nest hours (256 nest hours in 1998). 1176 total prey items were observed, giving a feeding rate of 1.8/nest/hour (2.7/nest/hour in 1998). 827 (70%) of these items were positively identified. Of these, 80% were sand lance (91% in 1998), 11% were herring, 5% were Atlantic silversides. Other items included hake, pollock, squid, and bluefish. Average length of sand lance was 2.1 bill lengths (1.3 in 1998).

In total, about 1000 COTE chicks were banded, and 30 banded adults were trapped. In addition, 5 banded adults (3 of which were decapitated) and 1 banded fledger were found dead in the colony.

LETE:

Phenology:
1st terns seen around the island - 14 May
1st eggs - ~28 May
1st hatch - 19 June

LETE again showed reproductive behavior on three areas of South Monomoy Island. Two pairs nested on the northeast tip of the island (where the major colony was last year). One of the pairs was there during the A-count and hatched two chicks. The other nest was lost to an unknown cause. One pair of LETE nested on the southwestern section of the island near Powderhole (where LETE nested in 1997). This nest was also lost to an unknown cause. The largest nesting area this year was on the south tip (where 75 pairs of late nesters established last year). During the A-count, 101 pairs of LETE were counted, and an additional 155 nests were established during the B-count. Productivity was low. Fledging success was not quantitatively measured, but some fledged chicks were observed. Many nests were lost between 9 July and 18 July to coyote, overwashing, and unknown causes.

ROST:

Phenology:
1st terns seen around the island - 7 May
1st eggs- 29 May
1st hatch - 26 June

Census: Twenty-seven pairs of ROST (28 nests) nested during the A-count window. An additional 14 nests were found after the A-count, but may have been renests. ROST nested in 8 different "clumps" throughout the entire COTE colony.

Productivity: ROST nests were checked nearly every day; chicks were weighed from day 0-3.
Average clutch size: 1.48 eggs/nest *1.45 in 1998*
(SD = 0.511, N = 22 nests of known completed clutch)
Hatching success: 0.93 eggs/nest (SD = 0.766, N = 28 nests) *1.05 in 1998*
Reproductive success: 0.71chicks/nest (N = 28 nests) *0.95 in 1998*

In 1998, all of the A-count nests that did not hatch were incubated to term. This year, of the 9 nests that did not hatch, 8 were abandoned during incubation, and 1 nest was lost to an unknown cause. Most of the nests abandoned between 15 and 20 June. Abandonment is likely due to nightly visits from a

Great Horned Owl, and nocturnal abandonment of the entire colony for 6 hours most nights from 14 - 24 June.

All ROST chicks were banded, and 8 banded adults were trapped.

BLSK:

Phenology:
1st seen around the island - 21 May
1st eggs - 5 June
1st hatch - 30 June

We had three pairs of BLSK nest on the north end of the island. One nest had 3 eggs, and the other two nests had 4 eggs. Ten of the eggs hatched, but only 1 chick fledged.

LAGU:

Phenology:
1st seen around the island - 5 May
1st eggs - 31 May
1st hatch - 26 June

Productivity: determined using 21 A-count nests
Average clutch size: 2.43 eggs/nest (SD = 0.676, N = 21 nests)
Hatching success: 1.91 eggs/nest (SD = 0.995, N = 21 nests)

An additional 16 nests were found after the A-count window. A LAGU also took and ate a COTE chick.

PREDATORS

GBBG AND HERG: Gull harassment was conducted in area A every 3rd day throughout April, twice a day in May, and about twice a week in June and July. A census was conducted on 16 May; 328 nests were in Area B and 3 nests were in Area A (down from 368 and 11, respectively, in 1998). Most of the nests containing eggs belonged to GBBG. Eggs in Area B were punctured to suppress productivity. Nests in Area A were destroyed. No chicks were seen in either Area A or B. 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, 35 new GBBG nests and 29 new HERG nests were counted. All the eggs were punctured.

GBBG were observed in the COTE colony 73 times on 33 different days from 10 May - 23 August. Three adults and 10 chicks (including fledgers) were observed depredated. HERG were observed in the COTE colony 28 times on 17 days during the same timespan. Six chicks were observed depredated.

NORTHERN HARRIER: A Northern Harrier was seen in the COTE colony 92 times on 32 days from 10 May - 23 August. Five adults and 5 chicks were depredated.

GREAT HORNED OWL: Great Horned Owl was visiting the COTE colony in June, and the colony abandoned most of the nights from 14 - 24 June. One owl was seen in the colony on 18 and 20 June. At least 18 adults found dead in the colony are attributed to Great Horned Owl depredation.

COYOTE: Coyote was in the colony at least 4 times this season; 18 and 30 June, 14 and 23 July. There was no evidence of taking the first two times the coyote visited. There was evidence of taking (in the form of mauled chicks) after both visits in July.

OTHER: We also saw a Peregrine Falcon on 5 different days; two attempts were successful and 1 adult and 1 fledged chick were taken.

Discussion:

What are the figures you gave for the reproductive success of common and roseate terns, was it just for the A period or were they mean calculated?
Just for the A period, and they might change a little bit, a lot of our data is still out at camp so the values may change slightly.

Were they nesting in the rock near the same area as they have been in the past?
Yes, the common tern boundary will be almost identical as last years, they didn't expand the acreage at all. *So there's a greater density?* Yes.

How did you get rid of the coyote?
We hired an expert who works for Animal Damage Control in Colorado. He uses a dog and a combination calls to bring in the coyote.

WHITE AND SEAVEY ISLANDS, ISLES OF SHOALS, New Hampshire
Reported by Diane De Luca

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 1950's. The 1998 field season saw significant growth as the number of breeding common terns climbed to 45 pairs.

1999 Overview

Gull Control
Discouraging gulls was done using the non-lethal techniques that established an atmosphere hostile to gull nesting. The following highlights the methods used:

- Arrival prior to gull nest initiation (April 21)
- Established continual human presence throughout gull and tern nesting season. (April 21 through August 21)
- Prior to gull control, conducted nest census, marked and mapped all potential nests.
- Destroyed all active nests by disposing of eggs. A brick or rock was placed in the nest cup to discourage repeated use.
- During early stages of season all personnel will wear bright orange vests while in the colony.
- Used a dog to disrupt gulls during the initial days of gull control.
- Used pyrotechnics, "bangers" and "screamers", to dissuade gulls from nesting and loafing.
- Walk the perimeter of the island ½ hour before sunrise and ½ hour after sunset each day to disrupt gull nesting and loafing.

Table 1. The results of the great black-backed and herring gull census; April 1997, 1998 and 1999. Dates: **April 28, 1997; April 23, 1998; April 27, 1999**

	# of Gull Nests			# of Eggs		
	1997	**1998**	**1999**	**1997**	**1998**	**1999**
TOTALS	302	166	76	93	6	22

Common Tern Productivity
Census Results (June 20, 1999): **80 PAIRS**
End of year total: **140 PAIRS**

Phenology:
Table 2. Breeding chronology and productivity of common terns on Seavey Island, 1997 - 99.

	1997	**1998**	**1999**
First tern arrives:	May 12	May 14	April 30
Copulation begins:	June 15	May 2	May 11
Incubation begins:	July 9	June 2	May 28
First hatch:	August 2	June 27	June 19
First fledging:	Sept 2	July 27	July 20
Total # pairs:	6	45	June 20: 80 July 15: 140
Total # chicks hatched	7	91	
Total # chicks fledged	6	approx. 75	
Productivity	1.0 chicks/nest	1.6 chicks/nest	

Productivity:
Number of nests monitored: **25** (Feeding nests)
Average Clutch Size: **2.84 eggs/nest** (SD = 0.37, N = 71 eggs, 25 nests)
Hatching Success (eggs hatched/eggs laid): **85.9%**
Average Hatch: **2.48 eggs/nest** (SD = 0.57)
Fledging Success (chicks fledged/eggs hatched): **91.8%**
Productivity (Average number of fledglings per nest):
Average fledge/nest: **2.24 fledglings/nest** (SD = 0.76)

MAINLAND TERN COLONIES 1999

Nest site	**#of pairs**	**Productivity Estimates**
Hampton Saltmarsh	approx. 30	approx. .25fledgings/nest
Backchannel Islands	0	
Hen Island	0	
Nanny Island	0	
Little Footman	6	0 fledglings/nest (GHO predation)

Feeding Study
Data as of Monday July 26,1999
Total Number of Feedings: 1146
Total Number of Feeding Hours: 139.45
Nest Hours: 695

Feeding Rate: 8.2 items/hour/5 nest
Nest Feeding Rate: 1.64/hour

Food Item	Relative % Frequency
Hake	47.2%
Unidentified Fish	21.4%
Herring	10.9%
Unidentified Item	9.7%
Sand Lance	2.2%
Food Item cont.	**Relative % Frequency**
Insect (Unid.)	1.5%
Grasshopper	1.1%
Butterfish	1.0%
Pollack	1.0%
Pufferfish	0.8%
Ant	0.6%
Pipefish	0.4%
Bait	0.3%
Lumpfish	0.3%
Cunner	0.3%
Dragonfly	0.3%
Three-spine Stickleback	0.3%
Moth	0.3%
Mackerel	0.2%
Amphipod	0.09%
Spider	0.09%

Discussion:

Seavey is a small island, do you have a feel for or a way of forecasting what the capacity might be, if it continues to grow? Seavey island itself is more than 3 acres in size and a good percentage of that is suitable for terns. White island also has some suitable habitat on it, that's were the house is and that's were there is a lot more human activity. The Isle of Shoals once supported close to two thousand pair, on an island not much larger, so I say the capacity is a lot greater than one hundred and forty pairs.

Do you think there was a pair of ROST terns attached to the sight but they did not nest? Yes, the ROST were here daily from June 5th on and showed a lot of courtship behavior including fish coming in to the island. We observed a lot of fish exchange but we were never able to determine that they were actual nesting.

Were the ROST banded?
One is actually banded and we're never able to read the band.

Were many of the common terns banded?
There are a certain percentage of common terns banded and we've been able to read some of those bands. They came from Great Gull, Jenny and Stratton Islands.

Were you able to check Horn Island?
We did check Horn Island there were no terns.

STRATTON ISLAND SUMMARY 1999
Reported by Julia Dodge

Terns:

Censuses:

Common Terns: Census dates => June 12 and 14
Unadjusted total => 1,015
Lincoln Index => 1.0935
Adjusted Total => **1,109 nests** ('98=969, '97=821)

Roseate Terns: Total => **100 nests** ('98=86, '97=66)

Arctic Terns: Total => **12 nests** ('98=12, '97= 6)

Productivity:

Common Terns: 83 nests: 17 feeding nests; 66 fenced plot nests
Average Clutch Size: **2.65** **(SD = 0.55)**
Average # Hatched: **2.36** **(SD = 0.81)**
Average # Fledged: **1.47** **(SD = 0.74)**
(1998 = 1.35 / 1997 = 2.13)

Roseate Terns: 45 nests: 11 feeding nests; 34 unfenced plot nests
Average Clutch Size: **2.02** **(SD = 0.40)**
Average # Hatched: **1.78** **(SD = 0.52)**
Average # Fledged: **1.73** **(SD = 0.54)**
(1998 = 1.12 / 1997 = 2.13)

Arctic Terns 12 nests: all unfenced plot nests
Average Clutch Size: **2.17** **(SD = 0.39)**
Average # Hatched: **1.55** **(SD = 0.82)**
Average # Fledged not calculated: insufficient data

Common Tern Feeding Study:

Sample size: 17 nests
Total feedings: 1,653 // 1,216 feedings identified to spp.; 437 unknown
Hours of observation: 1,142.25
Feeding rate: 1.45 feedings per hour
Top four food items and the percentage fed:

1. Sand Launce - 32%
2. Hake - 23%
3. Herring - 12%
4. Pollock - 2%

Roseate Tern Feeding Study:

Sample size: 11 nests
Total feedings: 838 // 672 feedings identified to species; 166 unknown spp.
Hours of observation: 496.5
Feeding rate: 1.69 feedings per hour
Top four food items and the percentage fed:

1. Sand Launce - 66%
2. Hake - 11%
3. Herring - 2%
4. Pollock - < 1%

Gull Control:

Nest Destruction: Herring Gull = 19 nests // 38 eggs
Greater Black-Back Gull = 12 nests // 30 eggs
Adults Killed: Greater Black-Back Gull = 5

Heron Census:

Census dates: May 26 and 27

Nest Counts:	Snowy Egrets = 163	('98 = 128 / '97 = 98)
	Glossy Ibis = 154	('98 = 124 / '97 = 90)
	Black-crowned Night Heron = 19	('98 = 29 / ;97 = 16)
	Great Egret = 1	('98 and '97 = 0)

Double-crested Cormorant Census:

Census date: June 24
Total nest count: 209 ('98 =165 / '97 = 136)

Visitors:

Total as of August 8: 379 visitors

A Common Moorhen pair bred again and fledged three chicks.
A Black Guillemot pair bred on Stratton and fledged two chicks.
An American Oystercatcher pair bred again on Little Stratton. They had three eggs, two hatched but zero fledged - they were eaten by gulls.

Discussion:

What did the least terns do?

They didn't do as much as they did last year, they came in force 50 - 60 birds, in mid-May and would hangout around near the spit at low tide between Stratton and Little Stratton. We set up the tern decoys and sound system in early May. The terns associated with the decoys a little bit in May but were gone by mid-June. They started showing up around again around mid July, late August but in very low numbers. In general, they would spend the evening at the island, and leave first thing in the morning.

Jenny Island, Casco Bay

Reported by: Hilary Cerny

The Jenny Island field season began on May 4th. . On May 19th, evidence of Great Horned Owl predation was found on the Northeast corner of the island. Additional evidence of Great Horned Owl predation prompted two nights of trapping during Memorial Day weekend. No owl predation was observed during the period. Also, on May 19th, a Laughing Gull nest was found on the island, the first ever recorded in Casco Bay. Resident wardens occupied the island beginning on June 4th. Jenny Island closed for the season on July 27th. Wardens working on Jenny Island included Hilary Cerny, supervisor; Mandy Lightcap, Tray Biasiolli, and Steven Yokim, Audubon interns; and William Cerny, volunteer.

The first Common Tern (COTE) chicks were found on June 13th. The first Roseate Tern (ROST) chicks were found on June 19th. The first COTE fledger was observed in flight on July 7th, and the first ROST fledger on July 14th.

GOMSWG Tern Census

The GOMSWG tern census was conducted on June 14th (14:00 - 14:30) and June 15th (11:30 – 13:00) (2 hours - total time). Participants included: Keri Parker, Lauryn Benedict, Keri Parker, Lauryn Benedict, Paul Piper, Josh Platt, and Hilary Cerny, and Mandy Lightcap. The census yielded 1045 COTE nests. The adjusted total, (using the Lincoln Index) was 1,129 nests, a decrease of 38 nests from 1998. On June 17th, Lightcap and Cerny censused Ram and Pond Islands in Casco Bay. No evidence of nesting terns was found on either island.

Ten ROST nests were located prior to the census; seven approximately 25 m SW of camp, and three in the northeast corner of the island.

Productivity

A total of 83 COTE nests were monitored for productivity, all were enclosed in chickenwire/hardware cloth plots. Sixty-three nests were monitored for productivity, and 20 nests were followed for both productivity and feeding data. The mean clutch size for all nests was 2.51 ± 0.59. The mean number of chicks hatched per nest was 2.22 ± 0.87 and the mean number of chicks fledged per nest was 1.35 ± 0.90. The decrease in the # of chicks fledged per nest from 1.57 ± 74 in 1998, may have been due to predation by a Great Horned Owl in May/June, and several confirmed visits by a Black-crowned Night Heron in June/July.

The mean clutch size for the ten ROST nests was 1.4 ± 0.52; 0.9 ± 0.99 chicks hatched per nest. One chick was found dead after hatching, and one chick was unable to be located after the five-day cut-off period. Seven ROST chicks fledged, averaging 0.7 ± 0.95 chicks per nest.

Provisioning Study

A total of 695.1 hours were spent conducting feeding observations at 20 COTE nests, from June 17th to July 23rd. One thousand and twenty feedings were identified out of a total of 1228 (83.1%). From the identified feedings, 38.4% were herring, 31.9% were hake, 13.8% were pollock, 5.2% were alewife, and 3.2% were sandlance. Sizes of prey items were estimated by comparing them to the length of the bill of the bird. The mean size of herring delivered was 1.84 ± 0.47 bill lengths; hake, 1.3 ± 0.60; pollock, 2.65 ± 0.61; alewife, 2.89 ± 0.54; and sandlance, 2.17 ± 0.74. The average size of prey for the entire island was 1.79 ± 0.79.

In addition to following chick feedings, chicks were enclosed in plots, to estimate growth rate and asymptotic mass. Each chick weight and natural wing chord were taken every three days.

Discussion:

Do you think your reaching maximum capacity with the common terns?
I would say so, yes it's been the same for the past couple of years.

Do you have any comment on the low hatching success of Roseates?
I really don't.

Did they abandon early or did they continue incubating, were the eggs fertile?
There are five abandoned nest and five that hatched. I don't know if they were fertile but they looked quite cold early in the season while the other nests were hatching. Nisbet states that ROST frequently lay one egg and abandon it, immediately to re-nest elsewhere.

Were they two egg clutches that were abandoned or one egg?
Mostly one egg, and the nests that hatched normally had two eggs.

Was the owl trapped or did it go on its own?
Traps were set, however, the owl left on its own three nights ago.

Pond Island National Wildlife Refuge
Reported by Keri Parker

Gull Control

Gull control on Pond Island in the past has included nest destruction, the shooting of problem birds, treatments using the avicide DRC 1339, and human presence on the island. During the 1999 season, as in the 1998 season, only nest destruction and human presence was necessary.

A total of 185 gull nests were destroyed this season, including 38 Herring Gull nests, 19 Greater Black-backed Gull nests, and 128 empty nests. These numbers indicate an increase in early season gull activity on Pond Island as compared to 1998, when 92 nests were destroyed. Most of this increase involves empty nests, as only 43 empty nests were destroyed in 1998. Only 11 of the total number of nests found this season were found in June, with the remaining nests discovered in May. Nesting activity ceased completely after June 19 when a particularly persistent pair of Herring Gulls finally stopped renesting. 226 nests were destroyed in 1997, and 1126 nests were destroyed in 1996.

Eider Productivity

This is the third year the hatching success of Common Eiders has been followed on Pond Island. Out of the 40 nests followed this year, 70% were determined to have hatched, up from 45% in 1998, and 27% in 1997. 5% of the nests were determined to have been depredated by gulls, down from 7.5% in 1998, and 15% in 1997. 17.5% of the nests were abandoned, down from 22.5% in 1998, and still up from the 13% abandoned in 1997. Determining the outcome of each nest was markedly easier this season as compared to last, with dry weather preserving the nests throughout the month of June. Thus the outcome of only 7.5% of the nests was unknown, which is a substantial improvement from the 20% unknown in 1998, and the 44% unknown in 1997. 5% of the nests in 1998 were determined to be flooded, while no flooding occurred this season.

Common Tern Social Attraction Monitoring Program

1999 marked the fourth year of Common Tern social attraction on Pond Island. The program included 86 hours of observation, during which 7,549 landings were recorded at a rate of 88.78 landings per hour. During the 1998 season, a rate of 31.64 landings per hour was noted, while a rate of 50.05 landings per hour was noted in 1997, and a rate of 14 landings per hour was noted in 1996. The average Common Tern high count near the decoys this season was 23, including terns on the ground and in the air. The highest number of Common Terns observed near the decoys was 50. This is an increase from 1998, when the average high count was 6, and the highest number of Common Terns seen was 14. This season activity was observed on and around other parts of the island as well-- as the sandy beach on the western shore proved to be a popular loafing and roosting sight at the beginning and end of the season. The average high count for the entire island was 58, with the highest number of terns seen being 90+ on May 28.

Much to our delight, Social Attraction efforts this season resulted in the discovery of 22 Common Tern nests. The initial wave of nesting began on May 28, and our GOMSWG census total on June 17 was 10 Common Tern nests. It should be noted that 11 nests were discovered during this period of time, however one one-egg nest disappeared shortly before the census date. Between June 23 and July 6-- 20 chicks hatched, making 1999 the first season since 1931 that

Common Terns have successfully bred on Pond Island. A second wave of nesting occurred between June 26 and July 15, and 11 more nests were discovered during this period of time. The average clutch size of the 22 nests is 2.18 eggs/nest with a standard deviation of .67. As the 1998 breeding season resulted in only one nest, these numbers are quite encouraging.

Common Tern Productivity

The first wave of nests resulted in 20 chicks from 11 nests. The second wave of 11 nests did not produce chicks. This late season nesting failure is most likely due to nocturnal abandonment resulting from Great Horned Owl visitation. This problem was evident-- several owl kills were discovered, including one adult taken at the nest. It seems that the capture of a Great Horned owl early in May, only three days after the first nest was found, prevented a cycle of nocturnal abandonment from developing – thus the first wave of nests hatched successfully. Unfortunately it is suspected that the second group of nesting birds did develop a pattern of nocturnal abandonment due to owl visitation, and this later group of nests failed to hatch.

Productivity was determined by daily sightings of chicks from stationary and portable blinds. 13 chicks were followed through 15 days, and an additional 3 chicks-- although missing on their fifteenth day, are suspected to have survived. Should this be the case, a high estimate of productivity for the 22 nests is .73 chicks per nest, with a standard deviation of .86. A low estimate excluding these three chicks is .59 chicks per nest with a standard deviation of .74.

Great Horned Owls

Nocturnal abandonment in response to visits from Great Horned Owls contributed to failed Common Tern nesting attempts during the 1997 and 1998 seasons. During the 1998 season two Great Horned Owls were trapped and banded on Pond Island and relocated at least 50 miles inland. In preparation for possible continued owl activity two Swedish Goshawk traps baited with live pigeons, and two leg-hold traps were operated and maintained this season, beginning on May 22. The traps were placed in the same locations as 1998. Potential perches in and around the decoy area were eliminated by either removing them or covering them with cut chicken wire. One unbanded Great Horned Owl was captured in a leg-hold trap on May 31, and was relocated more than 80 miles away from Pond Island.

No further evidence of Great Horned Owl visitation was discovered until July 11, when a Common Tern adult and nest (with three eggs) were found destroyed. Researchers also discovered the remains of what later proved to be a Manx Shearwater-- also taken by an owl, and a Wilson's Storm Petrel. Another respite from owl kills followed, until July 24 when a native Pond Island Common Tern fledger was found taken on the North Point of the island-- a considerable distance away from the decoy area and the chick's nest. The following day a Great Horned Owl was observed sitting on the south point of the island on the rocks. We were able to borrow three additional leg-hold traps from Jenny Island on July 26. Any remaining potential perches on the island were removed or covered with chicken wire. Therefore five leg-hold traps and two Goshawk traps were being maintained for the last week of the season. Despite these efforts the owl was not captured.

Fish Identification

We began recording the size and species of fish being brought into the colony on May 27. 708 fish were noted, and the species percentages are as follows:

	HERRING	SAND LAUNCE	HAKE	POLLACK	UNKNOWN
1999	8.19%	46.75 %	1.55%	2.97%	40.54%
1998	32%	18%	6%	1%	43%

Federally Endangered Species

Roseate Terns were seen regularly at Pond Island this season. Typically one or two a day could be observed flying over the decoys or fishing nearby throughout the season. Roseates were observed loafing in the small colony several times. From mid to late July Roseate numbers increased as a group of Common Terns began roosting and loafing along the western shore of the island. Roseate fledgers were seen daily being fed on the beach and around the colony in late July. Towards the end of the season a high count of fifteen Roseate terns flying over the island was noted. As Pond Island supports ample potential habitat for Roseate Terns, these observations are encouraging.

Piping Plovers were observed on a regular basis feeding, loafing, and chasing other species such as Spotted Sandpipers on the sandy western shore of Pond Island from mid June through mid July. The plovers typically spent the entire day on the beach, and on several occasions may have roosted near the dune edge. A high count of three Piping Plovers was noted- - typically there were one or two. Piping Plovers are known to nest at nearby Popham Beach State Park.

Discussion:

Any numbers on human visitation?
We do get quite a few visitors, maybe three visitors every other day in general.

Great horned owl caught last year was it banded?
Yes it was. The owl caught this year did not have a band.

Kennebec Point

reporting on

Pond Island

Census Dates: June and July, 1999

CensusMethods: Visual Estimates from Kennebec Point, observations of water collections and showers estimated 2 per week.

Radio Checks 1 to 2 per day

Nest counts 3 tents (2 on new platforms) and kitchen

Nesting pairs suspected but not observed

Productivity:

Fledgings / nest one intern / rotation, plus occasional guests

Nest count one intern / rotation = 4 nests, total

Standard Deviation Occasional guest visits created too much variation for accurate computation.

Methods

1) Feeding study: observed frequent onshore trips to Shop & Save for vegetarian foodstuffs.
Observed frequent attempts (unsuccessful) to catch fish from Pond Island.
Observed valiant attempt to grow flowers and vegetables that were seriously predated by meadow voles.
Participated in major feast at end of July with Hedges - treated to a glorious sunset barbecue in which our grandson learned new behaviors of stoneage society

2) Fenced plot.
   a) vegetable / flower garden fencing discouraged meadow vole predation.
   b) Chicken wire (fencing) deployed on top of owl roosts as part of "**plot**" to capture owls.

3) Unfenced Plot. Observation of escaping pigeons.

Clutch Size: (pooled from feeding and productivity #3)
Observed that no interns were lost to predation.

Final Comments: At the end of season, a thick fog required use of GPS navigational system to find Pond Island and effect the evacuation of supervisor, interns, and equipment.

Subsequent observation of the island from boat revealed hundreds of adults and fledgers loafing, fishing, and feeding about the island. This serves as evidence of the first successful nesting season on Pond Island since the 1930's.

Observers: Anne & Walter Gamble

August 9, 1999

Eastern Egg Rock
Report by Terry Goodhue

PUFFINS

·33 burrows were considered to be active.

·Up from 25 in 1998 -- a 32% increase.

·Up from 20 in 1997 -- a 65% increase in 2 years.

·Of these 33 burrows all fed fish, but one contained a broken egg shell not consistent with a hatched egg.

·25 burrows met the 21 day fish feeding requirement to be considered as having fledged a puffling. Observations of 4 other feeding burrows were cut off by our August 7 departure from the island.

COMMON TERNS

From June 13, 14 island wide census

· 1205 nests (adjusted by Lincoln Index)

· 1998-1396 nests -- 1997 - 1441 nests

Productivity: 55 nest sample

	1999	1998	% Decrease
Mean Fledge	1.07 fledgers / nest	1.17	8.5
Mean Clutch	2.56 eggs / nest	2.64	3.0
Mean Hatch	2.18 chicks / nest	2.21	1.3

Feeding Studies:

· 588 feedings in 643 hours

· .91 feedings / hour

Percentages of Identified Food Species:

Fish	1999	1998	1997	1996
Hake	89.4%	80.9	61	45
Herring	15.8%	13	15	10
Pollack	3.4%	3.9	.88	1.9
Butterfish	.9%	.4	1	22
Marine Invertebrates	7.2%	.2		

ROSEATE TERNS

- 149 nests by direct count

1998	1997
144	138

Roseate Tern Productivity: from sample of 25 nests

		1998	1997
Mean Fledged	1.24 fledgers / nest	.84	1.4
Mean Clutch	1.84 eggs / nest	1.88	2.0
Mean Hatch	1.48 chicks / nest	1.36	1.87

Roseate Feeding Study:

- 389 feedings in 289 hours
- 1.35 feedings / hour

Percentages of Identified Food Species:

Hake	Herring	Pollack	Butterfish	Marine Invertebrates
85.2%	6.8%	5.1%	.3%	8%

ARCTIC TERNS

·91 nests by direct count

1998	1997
81	94

Productivity: from sample of 20 nests

Mean Fledge .2 fledgers / nest

Mean Clutch 1.90 eggs / nest

Mean Hatch 1.0 chicks / nest

· This low productivity is mostly the result of predation on both eggs and chicks (aged 1 week or less)

LAUGHING GULLS

- 660 nests from island wide June 13,14 nest count.
- Up from 1998 575 nests 1997 500 nests
- 15% increase over 1998
- 32% increase in two years

- Leatherback Turtle Rescue -

05:45 July 18, 1999

From the Egg Rock Cabin roof I spotted a Leather back Turtle. He was entangled in a lobster trap equipment not far from shore on the west side of the island. I rowed out with two researchers. As we approached it, the turtle stopped splashing at the surface and attempted to swim away. We grasped the ½" line attached to the lobster buoy and the turtle towed us in a large arc restrained by the weight of the lobster trap. We gently drew our selves in close, pulling in the line. It was wrapped around the turtles right front flipper, then twisted around itself next going across its body in the groove under the neck. The five to six foot turtle didn't allow us to hold its flipper but using an oar we were able to unwind the line. The freed turtle backed under our Avon inflatable boat and slowly swam away and submerged.

Discussion:

Were the arctic tern nests geographically distinct from the common nests, and is that how you knew they were arctics?
Yes, we only had 91 nests so we flagged them. We later confirmed the species by direct observations using portable blinds.

Are you sure flagging doesn't facilitate predation?
I don't think so. I think predation occurs where the laughing gulls are traveling.

-- Crows have been observed keying into nests marked by flags. Flagging has also resulted in gull predating on sparrow nests on Kent island.

If you know that you have a specialist LAGU why didn"t you kill it?
Because we are not killing LAGUs. This is the first year we've seen this kind of specialist and also we don't have permits to kill LAGU. -*- Need to re-visit LAGU issue in the future.

METINIC ISLAND
Reported by Erica Chipman

Introduction:
This was the 4th field season on the Northern end of the 300-acre island, and the 2nd season of active tern attraction. The attraction area lies on the tip of the peninsula of the Northern end of the island. The 1998 field season did not produce nesting terns, although they were attracted to the area and were seen courting and making scrapes. The 1997 season produced one fledgling. The Northern end historically held 600 nesting terns.

Sheep Exclosure:
An electric fence enclosed the large tern attraction area on the end of the peninsula and successfully kept sheep out. This method differs from last year in which the narrowest part of the peninsula was fenced off, but several sheep entered daily by walking or wading around the ends of the fence and had to be chased out.

Gull Control:
Gull control was established by non-lethal means, except on one occasion where a certain trouble gull was shot at 3 times and missed. Gulls were dissuaded from the attraction area by human presence, pyrotechnic use, and the destruction of nests and scrapes. Within the peninsula 8 GBBG and HEGU nests and 22 scrapes were destroyed and several of these were from persistent individuals. The rest of the USFWS property up to the woods was searched and a total of 292 HEGU and GBBG nests and 163 scrapes were destroyed.

Terns - North end:

- Terns were first observed over the attraction area on May 18. Three nests were discovered between June 4 -10. Two were ARTE nests, each with 2 eggs, and 1 COTE nest with 3 eggs. All but 1 COTE hatched and fledged and all were observed beyond their 15th day.
An additional 11 ARTE and COTE nests were found after the census window. Two were abandoned, and it is believed that the 14th nester was still laying when the crew ended the field season on July 28.

Note: None of the terns nested within the fenced attraction area, although they were seen courting and digging scrapes within the area. Most of the located nests were within the berm debris on the tip of the peninsula.

A total of 320 food items were observed at the 2 ARTE and 1 COTE nests. Amphipods constituted more than a third of all food items.
Four top prey items:
Amphipod = 35%, Hake = 20%, Unknown Fish = 16%, Herring = 11%.

COEI:
62 COEI nests were counted and flagged on the USFWS property and of these 44 were recovered. Of the 44 recovered nests there was only 1 nest in which none of the eggs hatched.

A total of 182 creches were observed from May 29 to July 24. Creches ranged from 1 duckling to ~ 77, with an average of ~ 12 per creche.
Five observed predation attempts resulted in 2 successes, one each by a GBBG and a HEGU. In one attempt a GBBG was pummeled by an eider hen.

BLGU:
The entire North end of the island, ending at the wooded portion, was searched for BLGU burrows. Thirty-four burrows were located and 26 chicks were banded.

Other:
Fifty-four bird species were identified on and around Metinic, and of these 14 were breeding species.

Discussion:

> *There seems to be a correlation between tern abandonment due to sheep removal from islands?*
> It's been shown on other islands that co-existence with sheep is needed to keep vegetation down so tern can nest on the island. We are doing vegetation studies now and it's not our objective to exclude the sheep for the year. We only exclude them from the restoration area during the breeding season.

Seabird Surveys in Penobscot & Jericho Bays
Reported By John Drury

Observations described below were made from a 34' 10 knot power boat based out of Green's island, Vinalhaven, questions about these observations could be addressed to John Drury Po. box 102 Vinalhaven, ME. 04863, 207 863-4962, jbdlam@foxislands.net

The observation season ends too early, the birds aren't finished by the first week of August. To produce a more accurate and thorough record of what is out there during these years, it would be worthwhile to maintain observers on Seal island and Matinicus Rock at least through August.

Terns nesting in the Penobscot and Jericho bay area (survey supported by MDIFW).

There were more nests found this year then last in each of the wild Tern colonies in mid coast Maine except for the colony at the southern end of Metinic where there were a few less. All the colonies persisted through the year except for those at the South end of Metinic and at Metinic Hog island . Native fledglings were seen at Little Green, Great Spoon, Dry Money Ledge, and Three bush. Gulls were responsible for the failure of the Metinic birds. The beaches the terns chose to nest on are also prime Gull nesting territory. Fledged young were seen at these nesting areas last year despite the Gulls. As the Gulls on these beaches have learned that the terns eggs are good eating the terns will abandon these particular sites. The Terns were massing at the north end of the island in late July and August and it is likely that most of the breeding effort next year will be made there.

Wooden ball
June 16, 8 terns over the nesting area on the NW shore. Three nests located
July 19, 6 adult Arctic Terns over the nesting area, no fledglings seen, 6 Whimbrel.

Metinic Island Southern end.
June 17, Total: 108 nests found in four nesting areas (~ 70 pairs of ARTE, ~ 40 pairs COTE).
There were a total of 117 nests found in these four nesting areas in '98,(~90 pairs of ARTE, ~ 30 pairs of COTE).
July 20, South end :These terns failed completely and few are attempting to nest again in this area .

Metinic N. end
July 20, 75 adult ARTE & COTE on the northern shore of the NE point.
August 20, Tern flock swells to ~200 at dusk, mostly COTE, many fledglings.
Aug. 21, ~ 60 adults in the area. Five unfledged chicks seen from a distance on the beach.

Hog Island, (Metinic), June 17, total: 12 nests found. ~ 50% COTE.
July 20, 15 adult Arctic terns roosting on the hog island side of the narrows, 0 fledglings seen at Hog island.

Little Green,
June 17, 1200 + Eider mostly on the western shore flushed off by us.
Total 70 nests found on the island ~40 Arctic and 30 Common.
There were 16 nests found on Little green in '98, only a couple of which were Common Terns .
July 20, 50 adult terns roosting on the low tide rocks, 80% are ARTE. High count of 13 Fledglings.

Little Two Bush, June 17, 3 adult COTE, 1 nest found, 1 egg, 2 chicks.
July 21, 2 adult COTE, 0 fledglings seen.
There has been a single pair of Common terns nesting on Little two bush for several years.

Great Spoon,
June 5, ~40 COTE on the spit, seen form the west.
June 18, ~ 40 COTE. Total 32 nests found. (There were 22 found in '98)
July 14, Great Spoon Spit, 25-30 adult Terns defending the area vigorously,
July 29, ~25 adult terns over the nesting area on the spit, high count of 13 fledglings.

Three bush
June 5, Estimate island total 180 Common Terns.
June 18, ~350 adult Common Terns. Total 189 nests found. (There were 165 nests found in '98)
There was also a dead Minke whale on the island.
July 14, 40 adult terns eastern end, one large Tern chick seen.
July 29, 45 adult COTE, 16 fledglings, counted on the NE corner.

Dry money ledge,
June 10, ~55 COTE
June 18, Total 45 nests found. (There were 18 nests found in 98)
July 29, ~25 adult COTE, 9 fledglings seen ashore.

Shore bird Ledge, (South of burnt island, Seal bay Vinalhaven) June 14, One COTE nest with 2 eggs.

Cormorants:

There were a total of 142 Great Cormorant nests counted at 9 sites on eight islands. There were Great cormorants nesting on Little Duck island for the first time this year, one nest was seen. There were a total of 141 Great Cormorant Chicks seen July 14 at Little spoon NW, and July 29 at Great Spoon, John's Island and Green ledge where there had been 76 nests counted during the first week of June. Again these birds raised ~ 2 chicks per nest. The decline in the number of nesting Great cormorants is not due to nesting failure.
Counts at Double Crested cormorant colonies listed below were made from the boat.
GC= Cormorants, DC = Double crested Cormorant.

little Roberts: 7/5: 20 DC nests on the w. Knob, 7 GC. Nests on the e. Knob, 80 DC nests eastern Knob
Seal Island, 5/28, 12 GC nests in South west cove
Little Spoon SE. 6/5, 27 GC nests, 43 Adult, 43 DC nests.

NW little Spoon. 6/5, 24 DC nests, 38 Adult GC, 17 GC nests
7/14, Little Spoon NW. 42 GC chicks 1st count, 44 GC chicks 2nd count, from @ 16 nests.

Great spoon Spit, 6/5, North end, 25 GC obs, 17 GC nests. highest part of the spit, 41 GC obs 18 nests.
7/14, 38 GC chicks counted from the east at the northern nesting group (chicks were from 14 nests)
26 GC chicks in the nesting area on the highest part of the spit. (Chicks were from 14 nets)
7/29, 37 GC chicks on the N end nest area, 23 GC chicks highest part of the spit.

Spirit ledge, 6/5 1 GC adult, 0 nests. 2 DC. adult one or two nests.
Mason ledge, 6/5, ~ 8 DC nests, 1 adult GC, 0 GC nests, probably several more DC nests obscured.
Brimstone, 6/5, 10 Adult GC. 1 imm. 8 in a clump,
John's Island, 6/5, 7 adult GC & 5 nests, 35 DC nests.
7/14, 8 GC chicks in 3 nests one nest obscured unknown number of chicks
7/ 29, 15 GC chicks

Southern Mark 6/5 SE shore, 27 adult GC & 18 nests, 180 DC nests, NW side, 25 adult DC & 7 nests, 0 GC.

Green ledge (Fog Island) **6/5** 32 adult GC & 19 nests, ~ 10 DC nests,
7/14, 25 GC chicks from 12 nests.

Little Duck, 6/10 1 GC nest, There were a total of ~160 DC nests counted in the trees.

Islands with DC colonies where No GC where seen.
Egg Rock, (east of Petit Manan) no count made of DC nests, it was hard to see.
Old Man, 2 imm. GC, 3 Canada Geese, ~100 DC nests,
Freeman, Rock. June 10, total 100 DC nests,
Pulpit Rock, 1 adult GC & 2 imm. 20 DC nests eastern end plus 53 from the west.
Schoodic Island, ~85 DC nests
Sparrow island, 1 adult GC, 45 DC
Green Ledge (Criehaven) 55 DC nests
No man's Land,2 adult & 3 imm. GC, 108 DC nests
Little Green,, 175 DC nests,
Metinic Green, 160 DC nests
Yellow ridge, 52 DC nests, 3 imm. GC.
Hurricane,, 40 DC nests, 0 Terns,
Oak Island, 60 DC nests, 0 GC
Crescent Is. 1 Imm. GC. 5 DC nests.
Marblehead, 70 DC nests, 1 imm. GC. 0 Egret, 0 Terns.
Fisherman's Is. 126 DC nests
Other Islands with Zero Great Cormorants: Saddleback Jericho bay, Shag Rock (Roque Island),

Razorbills:
Freeman Rock June 10, ~ 50 Razorbill,
Old man June 11, ~ 160 Razorbill observed
Pulpit Rock, June 11, high count of 20 Razorbills,
Black ledge, 7/14, ½ mile west of the western ear of Isle au haut. adult Razorbill and chick.

Guillemots/Mink on the islands SE. of Vinalhaven.
Animal damage control money from the MDIFW paid for the effort to remove Mink from the Islands. Support for the follow up Guillemot research came from the Vinalhaven Land Trust and the Petit Manan National Wildlife Refuge.

Mink Traps were set on Otter Roberts and Carvers Island on April 9th the traps were taken up May 11. There were no mink caught and there was no sign of Mink. The traps were set in case a mink arrived on the islands during the pre nesting season. This is the fourth year of trapping on these islands. There were two Mink caught on Otter during the summer of '95, 3 caught on Otter and one on Roberts during the Spring of '97 and one caught on Otter during the spring of '98.

Four counts of adult Guillemots were made around each island in mid May. The high counts were: 200 at Otter, 68 at Roberts, 51 at Hay, and 156 at Carvers.

A search for Guillemot nest sites was made at Roberts, Hay, Otter and Carvers during the first week of August. In '95 during a similar search of the shoreline there were 31 sites with chick guano, and 14 live chicks found on these four islands. In '96 there were only 12 sites with chick guano and only 2 live chicks found. (Otter was not searched, only one site with chick guano had been found there in '95)

This year there were 123 sites with chicks guano and 59 live chicks found.
There were apparently no Mink waiting in the wings to move to the islands and the Guillemots had their first good year in a while on there.

I wouldn't say these colonies had been restored, they were re-established after the de-establishment of the Mink colony.

There was no sign of Petrels nesting on Otter. The Mink ate Petrels on the island in '95.

Eiders
On May 15th there were 465 male Eider counted around Otter, 385 around Roberts, 213 around Hay (Lanes Nubble), 315 around Carvers, 141 around Little Roberts, 130 around Little Brimstone, and 770 around Brimstone.

Matinicus Rock
Island Supervisors: Christina J. Maranto & Susan E. Schubel

GOMSWG Census

The census was conducted on 17 and 18 June 1999. The total count for Arctic and Common Tern nests combined was 1043, with a corrected value of 1070, an increase of 182 nests from 1998 (20% increase).

The species ratio of Arctic (ARTE) and Common (COTE) Terns was performed by identifying nests to species from various locations in a portable blind in Tern Census Sector 1, the main nesting site of COTE. Because most of the COTE nests are clustered in one area of Sector 1, a direct count was employed to determine species ratio. 102 COTE nests were found. Additional sightings of COTE nests add 2 to the total, yielding 102 COTE nests and 968 ARTE.

Laughing Gulls were also censused. A total of 367 nests were counted, an increase of 24 nests (7%) from 1998.

Arctic Terns

Tern Timetable

5/18 Terns arrived on the island
5/26 First tern eggs
6/15 First tern chicks
7/2 First tern chicks fledge (15 days old) in productivity plots and feeding study area

Productivity

Productivity was determined for Arctic Terns by following chicks, up to a fledging age of 15 days, from two enclosures and 17 feedings studies (61 nests). From these nests, mean clutch size was calculated as 1.88 ±.41. Mean # hatched/nest and mean # fledged/nest were also calculated as 1.54 ±.76 and 0.87 ± .59, respectively. The productivity calculation (mean # fledged/nest) is considerably higher than in 1998 (.43 ± .62).

Chick Provisioning Study

Seventeen Arctic Tern nests were observed for a minimum of 36 hours (12 hours/week) in the provisioning study. A total of 2047 feedings were recorded. 89.9% of these feedings (1840/2047) were identified. Out of the 1840 identified feedings, 52% (957) were White Hake, 26.1% (482) amphipods, 7.4% (137) Herring, 4.3% (80) Sand Lance, 4.0% (75) Butterfish, 3% (58) crustacean, and 6.2% other (includes food items that were represented less than 1 % in the diet: Stickleback, Lumpfish, Pollock, Puffer, Goosefish, Bluefish).

Relative sizes of food items were also recorded in the chick provisioning study. The size of the food was estimated by comparing the length of the food item to that of the bill, from the tip of the bill to the culmen. Data were analyzed for only major food items. Amphipods were the smallest in size, averaging 0.26 ± 0.05 bill lengths. Hake and Herring were larger with average values of 1.46 ±.44 and 1.80 ±.32 bill lengths. This year the size of the food was larger compared to values of 1.15 ± .46 and 1.76 ± .42 bill lengths for Hake and Herring in 1998.

Laughing Gulls

This year a Laughing Gull Predation Study was conducted from 9 June to 23 July, to quantify predation on Arctic Terns. The observation area included 30% of the Arctic Tern nests on the island (Sectors 3 and 4). Six predation events were seen in 68 hours of observation. We extrapolated to 37 chicks taken during the total number of daylight hours during the study period. This number is 8.5% of the Arctic Tern chicks in Sector 3 and 4.

Atlantic Puffins

Breeding activity for Atlantic Puffins was established by checking all puffin burrows on the island and by observing puffin feedings. Burrows were considered active by the observance of a feeding or the presence of eggs, eggshell fragments or chicks. This year 176 burrows were active, a 3% increase from 1998 (This increase in puffin burrows may not be accurate because of inconsistent effort). Out of 176 active burrows, 68 chicks were banded.

Razorbills

Razorbill burrows were checked for activity in late June by observing feedings or the presence of eggs, eggshells, or chicks. This year, 68 active burrows (23 eggs, 38 chicks, 5 eggshells, and 2 feedings) were found, which is a 62% increase from 1998 (42) and a 15% decrease (80) from 1997.

Common Murres

The Common Murre attraction program continued this year, the eighth season of the program. Peak numbers of murres occurred in late May and slowly waned throughout the season. The murre high count this year was 7 recorded on 26 May, which is 9 less than the high count in 1998 (16). Murre activity was lower this year than in 1998. Murres were seen on 63% of the observation days at the murre ledge. This is a 14% decrease from 1998 which yielded 77% of days observed w/COMU.

Discussion:

No questions, however, on July 6th a yellow headed albatross circled around the island for a couple of hours.

Seal Island National Wildlife Refuge
Reported by: Andre Breton

GOMSWG census

DATE: 6/16/99-6/17/99
CENSUS CREW: Andre' Breton, Dale Tyson, Scott Hall, Karen Chapman, Heather Whittaker
UNADJUSTED CENSUS TOTAL: 1,993 Tern Nests (mixed ARTE/COTE)
ADJUSTED CENSUS TOTAL: 2,037 Tern Nests (mixed ARTE/COTE)
CORRECTION FACTOR: 1.022058824
SPECIES RATIO:
Nests Identified to Species: 546
Total COTE: 256 (47% of 546)
Total ARTE: 290 (53% of 546)
Ratio applied to adjusted census total: 955 COTE/1,082 ARTE
Note: ratio in 1998 also 47% COTE and 53% ARTE

ARTE PRODUCTIVITY (combined Feeding Study nests with Productivity Plot nests)

Enclosure	Nest #	Clutch Size	# Chicks Hatched	# Chicks Fledged
Feed Study	20	41	37	18
Plots	38	74	61	34
TOTALS	58	115	98	52
Mean Fledge				.896 +/-.45
Mean Hatch			1.69	
Mean Clutch		1.98 +/-.23		

1998 data(combined plot/feed):MF=.90 +/-.30, MH=1.51, MC=1.85

COTE PRODUCTIVITY (Productivity Plot nests only)

Enclosure	Nest #	Clutch Size	# Chicks Hatched	# Chicks Fledged
TOTALS	23	62	56	22
Mean Fledge				.956 +/-.37
Mean Hatch			2.43	
Mean Clutch		2.70 +/-.47		

1998 data (plot only): MF=.87 +/-.34+A20, MH=1.81, MC=2.0

ARTE FEEDING STUDY RESULTS

TOTAL FEEDNGS RECORDED: 2277
TOTAL OBSERVATION HOURS: 878
FEEDING RATE IN 1999: 2.59

% 1999	% 1998
HAKE: 33%	HAKE: 66%
HERRING: 3.3%	HERRING: 10%
AMPHIPOD: 47%	AMPHIPOD: 17%
BUTTERFISH: 1.3%	BUTTERFISH: 1%
SANDLAUNCE: 3.0%	SANDLAUNCE: 2%

Note: mid season review of data showed that although less hake were brought into study nests from 6/21 to 7/4 in 1999 than 1998, 40% were 1.75 to 2.5 tern bill lengths in 1999 as compared to 0% above 1.5% in 1998. A closer review of the data presented above may identify other differences between the two seasons. The 1999 Seal Island report will take a closer look at this. All those interested in those results should contact the Seabird Restoration Project.

ROST Productivity

one pair of ROST's were confirmed breeding on SINWR in 1999. The pair laid one egg and fledged one chick. Chick condition strong on day 10.

RAZORBILL AUK NESTING ON SINWR

TIMETABLE: 6/5, 6/9, 6/13: Razorbill reported circling in area where RAZO burrow was eventually discovered.
7/8 (AM observation): Razorbill reported flying with fish and dropping out of view (same location as above-Area 2 SINWR)
7/8 (PM observation): no Razorbills observed in area of AM observation.

7/9 (AM observation): Razorbill without fish drops out of view near observer. (ATPU in burrow with its chick at this time). Two species sharing the same open space under large slab of granite. One meter of air between them.

7/10: Razorbill chick removed from burrow and photographed for documentation. Not banded.
7/13: Razorbill pair and chick not in burrow. Suspect chick fledged with adult male.

ATLANTIC PUFFIN NESTING ON SINWR

TOTAL BURROWS 1999: 115 (as of 8/6/99;this number could change, a small crew will be returning to Seal Island for one week in late August)
TOTAL BURROWS 1998: 78
HIGHEST SEASON COUNT 1999: (August 6th) 176 ATPU
HIGHEST SEASON COUNT 1998: (August 4th) 168 ATPU
Note: Daily high counts for ATPU in 1999 were consistently higher than 1998.

Breeder summary at new burrows in 1999 (total 36):
Banded Breeders Machias Seal Island: (1) 797
Banded Breeders Matinicus Rock: : (4) 347, 277, 3–, –4
Banded Breeders Seal Island R: (5) C2, U47, U51, D1, U57
NWR:
Banded Breeders Petit Manan: (0)
Banded Breeders Eastern Egg Rock: (1) U26
Unbanded Breeders: (41)
Breeders not identified (recorded as unknown): (22)

Pete Salmansohn - NAS Education

This year eco-tourism boats made 80 trips bringing out 3500 people to see the puffin and tern colony at Eastern Egg Rock.

We have a school (outreach) program starting in September, one of the high lights this fall will be a cooperative teacher workshop with Friends of Monomoy and it will be held on Cape Cod, also Manomet Bird Observatory will be included and we hope to get 25 to 50 teachers per day learning how to teach there kid about the world of coastal birds.
If anybody is interested in perhaps helping to sponsor a teachers workshop some were in New England please contact Pete Salmansohn

Ship Island - 1999
Written by: Krista Amey

Ship Island was staffed from May 21 through to July 27

1st tern nest with an egg was found on May 25

GOMSWG census was conducted on June 17. Actual count was 527 and the adjusted total was 558 Common Tern nests (This was only a 58 pair increase from the 1998 census. This lack of a substantial increase may be attributed to several visitations during the pre-laying and laying periods by a Peregrine Falcon. Pre-laying counts indicated the potential for ~700 pairs to nest during the 1999 season.

- Mean clutch size for the census was 2.41

It seemed as though incubation was prolonged by about a week due to frequent visitations by a Peregrine Falcon. Early in incubation, following a visit by the Peregrine, particularly if the falcon caught an adult, the terns would leave Ship Island and either loaf on Trumpet or leave the area entirely. When this occurred in the evenings, the terns would be a couple of hours returning to their nests.

1st tern chick was found on June 22

1st tern chick takes to flight on July 12

Productivity

- 47 nests were monitored for productivity; 17 in the feeding plots and 30 in two enclosures
- the overall mean clutch size was 2.21 ± 0.58 *standard deviation*, hatch rate was 1.45 ± 0.94, fledge rate was 0.96 ± 0.8 fledged
- the low productivity was driven primarily by one plot where fewer than half the nests hatched and fewer than half of those chicks fledged. The low hatch rate is likely attributed to the aforementioned visits by the Peregrine Falcon either directly, by the Peregrine taking incubating adults, or indirectly, by the mere presence of the falcon. On two occasions, the Peregrine was observed perching on boulders adjacent the enclosure. The low fledge rate is due to a Merlin, which began visiting in early July. The Merlin was observed perching on one of the stakes of the enclosure and subsequently, presumed to have killed at least six of its fledglings. The ages of these chicks ranged from 14 to 21 days; four of them were found dead inside the enclosure (two of which were decapitated). In response to these killings, the chickenwire was taken down prematurely. Subsequently, two more chicks were found dead and beheaded, one just outside were the enclosure had been and the second on top of the berm.
- nesting success is likely further reduced as the Peregrine had caught several fledglings but had taken them to Mount Desert Island, at least a couple of these were likely from our plots.

Chicks in the productivity plots were weighed with natural wing chord measured every other day; the mean mass at fledge was approx. 120g and wing was 175mm

386 Common Tern chicks were banded, 66 from the study plots and 320, during a mass banding effort, which took place the second week of July

Provisioning Study

- Observations of food delivery began on June 25 and ended July 20.
- 257.4 hours were spent in observation using 16 active nests.
- A total of 495 feedings, with 351 (71%) identified
- of the 351, 32.2% were herring, 28.5% pollock, 12.4% sandlance, 11.7% insects, 11.3% hake, and the remaining 4% consisted of crustaceans, butterfish, lumpfish, and stickleback
- mean lengths ± standard deviation of the five main prey items, measured in culmen lengths: herring, 1.87 ± 0.48; pollock, 2.50 ± 0.48; sandlance 2.53 ± 0.57; insects, 0.85 ± 0.25; hake 1.98 ± 0.63
- overall rate of provisioning was 1.5 feedings/hour
- 44.9% of the feedings went to the A-chicks, 48.8% to the B-chicks, 4.8% to the C-chicks

Predation on Terns

- Peregrine Falcon visited regularly throughout the season, beginning on May 26
- It was sighted on 31 days, with a known 45 visits
- the number of known kills: 10 adults, 6 fledglings and 2 of known ages (too distant to discern if they were adults or fledglings)

- Merlin began visiting on July 7 and was sighted virtually everyday until July 26 (the day before we left)
- it was sighted on 13 days, with a known 23 visits
- the number of known kills: 8 fledglings and 6 fledglings were presumed to have been killed by the Merlin
- The Merlin exhibited apparently previously undocumented behaviour in that it would behead its prey and then skin the head and eat the brains, often leaving the remainder of the body. However, this was likely due to being scared off and was unable to get a firm grip on its prey. Several kills of this nature were discovered and assumed that it had been the Merlin, based on the location of the kills and that the Merlin was the only likely predator around other than the Peregrine, which would take its prey to Mount Desert Island immediately after catching them. On July 25, it was confirmed that the Merlin was the predator that had been decapitating the chicks. Photographs were taken of this and other kills and copies will be sent to the Refuge once developed.

- Gull predation was not a problem this year on Ship Island. The only incident was on July 18 when a Great Black-backed Gull took an approximately 20-25 day old fledgling that was swimming in the water.

Common Eiders

- counted daily; numbers peaked at 850 on May 27 and gradually diminished throughout the season
- 1st creches were observed on May 29
- number and composition of creches were documented - 19 creches were observed and the greatest number of ducklings in a single creche was ~20
- Great Black-backed Gulls attempted on several occasions to take ducklings from creches, but were successful only 5 out of 28 attempts (18%)

- Creches soon disappeared after initial observation and it seemed as though the number of times gulls were observed taking ducklings was not enough to wipe out all of the ducklings. Therefore it seems likely that the hens were moving their ducklings away from Ship and Trumpet (somewhere in Blue Hill Bay) to be reared in the absence of gulls.

Other

- Bald Eagles were observed taking Great Black-backed Gull chicks from West Barge and Trumpet Island on at least 10 occasions
- A pair of American Oystercatchers arrived on June 3 and spent virtually the whole summer on Trumpet Island, they did not attempt to nest

Discussion:

Did you attempt to trap and relocate the merlin? No - The Refuge decided that predation by the peregrine and merlin were part of the natural processes that have occurred on these islands for years. In addition, we did not believe that the merlin threatened the existence of the colony (given it arrived so late in the season)

PETIT MANAN ISLAND

REPORT BY RACHEL BRYANT

We estimate an addition of 91 tern nests to PMI between 1998 and 1999, an increase of 6.5 per cent. Our estimate of 580 Arctic Tern pairs nesting was substantially higher, and that 908 Common Terns slightly lower than those reported in previous years. This might be as much a function of sampling method as a change in species ratio. Our species ratio estimate belies the "three egg Common" method, which applied on PMI would yield an estimate that over two times as many Arctic Terns as Common Terns nested.

We found 28 Roseate Tern nests this year, which is 9 more than in 1998. However, it is one fewer than in 1997. Assuming that more nests existed than were reported in 1998, the Roseate Tern population, which has fluctuated severely during the past fifteen years, appears small but stable. Roseate Tern reproductive success was good, at 71.4 percent, and 1.30 +/- .60 s.d. chicks fledged per nest. Roseate chicks subsisted almost exclusively on herring.

Common Terns' nesting success was 55.6 %, with 1.05+/- 0.53 s.d. chicks fledged per nest. Arctic Terns had 29.5 % nesting success, and fledged 0.50 +/- 0.51 s.d. chicks per nest. A number of factors might explain Arctic Tern's low reproductive success. Low hatching rates drove down the success of those nesting on the productivity plots. The majority of these birds nested in a grassy area, recently made available by a controlled burn in 1996. These birds might thus have been young, and/or newcomers to the colony. Their inexperience could explain their low success. In addition, we frequently trapped birds in and around the productivity plots during the end of the incubation period. Although we did not note any nest abandonment within a day of each trapping effort, the disturbance caused by trapping might have lowered hatching success. The Arctic Terns nesting in the feeding watch plot had higher hatching success and lowing fledging success than those in the productivity plots. This is likely because the feeding watch plot was located on the edge of a dense group of birds nesting on the berm, near the roost of a predatory Herring Gull. Almost all of the chicks that failed to fledge from this plot were never found, implicating predation. We found most of the Common Tern chicks that failed to fledge from our feeding and productivity plots. They were almost invariably emaciated.

Arctic Terns' breeding season was slightly earlier and markedly less protracted than the Common Terns'. This might be because Arctic Terns face stricter migration constraints.

The predominant species in Common and Arctic Tern chick diets were herring and hake, respectively, but neither fish species accounted for more than 60% of the diet. Other items in their chicks diets included pollock, sandlance, larval fish, lumpfish and butterfish. Both Arctic and Common Terns fed their chicks at rates less than half those reported at GOMSWG colonies last year. This in conjunction with the fact that we hardly saw any Puffin feeds, might indicate a local paucity of small, schooling pelagic fish.

Unlike the terns, and possibly the puffins, the benthic-feeding Black Guillemots seemed to provision their chicks very well with sculpin and gunnels. We often saw over three feeds to a single nest within 20 minutes. Chicks seemed large and heavy, and many nests held two nearly-fledge-age chicks. The Guillemot habitat was apparently saturated, and birds nested successfully in unlikely places. For instance, we found two nests (with healthy chicks) under plywood boards washed up on the rocky berm, and one nest in the grass under the sparse cover of angelica plants. The occupation of nearly all boulder/scree habitat by the Guillemots could be responsible in part for the lack of nesting Razorbills on the island.

Alcid counts followed a typical pattern this year. Counts were highest early in the season, with both nesters and prospectors at the colony. They decreased during the incubation period, and increased again around the onset of hatching. We only saw immature puffins at or near the colony during the chick-rearing period.

The number of Atlantic Puffin pairs nesting on PMI has increased almost steadily since 1990. This years' estimate of at least 24 pairs is the highest yet recorded. Most of the puffins we resighted had been banded on Machias Seal Island, suggesting possible colonization of Petit Manan from the more easterly colony.

The number of 114 Black Guillemot nests we found is up 40 per cent from last year. However, it is in keeping with earlier estimates. Although we searched thoroughly, we are confident that more Guillemots nested than we found.

Predation by Herring and Black-backed Gulls seemed to be limited to specialists. Although gulls rested in large numbers in the intertidal zone adjacent to tern nesting areas, few attempted to take terns. Those who did, did so repeatedly.

As raspberry was the predominant vegetation in many of the southern grid square blocks, and as no terns, very few Laughing Gulls and virtually no Common Eiders nested in raspberry bushes, destroying the raspberries could create tern nesting habitat without adversely affecting other birds.

Discussion:

How do you account for the low ARTE productivity? We can't.

Peregrine predation lower this year?
Yes, it's comparable or a little lower than previous years.

MACHIAS SEAL ISLAND -
Submitted by Kate Devlin and Laurel Bernard

Significant Dates

Terns
First Tern Nest: May 27
Peak ARTE Egg Laying: ~30 May - 5 June
Peak COTE Egg Laying: ~3 June - 10 June

First Tern Chick: 20 June
Peak ARTE Hatch: ~22 - 27 June
Peak COTE Hatch: ~25 June - 2 July

Alcids:
First puffin egg in sample calculated to have been laid: May 2
Median nest initiation: May 11
First chick hatched: June 11

First razorbill egg in sample calculated to have been laid: May 11
Median nest initiation: May 19
First chick hatched: June 15

Breeding Success

	ARTE	COTE
Mean Clutch Size	1.8	2.5
sd	0.39	0.58
n	33	26
Mean # Hatch / Nest	1.2	2.1
sd	0.87	0.84
n	33	26
*Mean # Fledge / Nest	0.6	1.3
sd	0.55	0.67
n	31	26
Total # of Eggs	60	65
Total # of Hatched Eggs	41	54
Total # of Fledged Chicks	20	33

* Mean # of fledglings per nest (fledglings / clutch size), including nests that did not hatch.

	ATPU	RAZO
Number of nests in sample	81	60
Number of eggs hatched	56 (69%)	48 (80%)
Number of chicks fledged (Day 35)	48	37

Provisioning Study

Table shows the prey species delivered to nests of each species (includes items that were not necessarily swallowed by chicks).

	ARTE	COTE	ATPU	RAZO
Hours of Observation	73	54	40	48
Total # items observed	299	424	1730	1186
Identified items	75 % (224)	89 % (378)	82 % (1415)	92 % (1092)
Herring	42 % (94)	49 % (187)	62 % (872)	78 % (853)
Hake	22 % (49)	13 % (51)	23 % (321)	8 % (92)
Sandlance	22 % (49)	11 % (42)	15 % (214)	11 % (123)
Butterfish	9 % (21)	1 % (5)	0.4 % (5)	0.6 % (7)
Pollock	2 % (5)	21 % (78)	0.2 % (3)	2 % (16)
Stickleback	2 % (4)	1 % (3)	0	0
Invertebrate	1 % (2)	3 % (10)	0	0.09 % (1)
Other	0	1 % (2)	0	0

Species Ratio

Two methods were used to determine the species ratio of Arctic and Common Terns nesting on Machias Seal Island. The first method is one that the warden from the Canadian Wildlife Service (Jason Hudson) has used for the last 6 years. He goes to 14 different sites on the island (using blinds and other fixed points) and identifies as many birds landing on nests and loafing in a roost (it should be noted that only two roosting areas are observed and fewer than ~100 birds are identified while loafing). This method samples the birds nesting in different areas of the island. The second method used this year was conducted by Laurel Bernard and Kate Devlin separate to that used by Jason Hudson. We also travelled to fixed points on the island using blinds and the lighthouse tower. Only birds landing on nests were identified. In this method we systematically identified birds nesting on all areas of the island. The timing of the two methods overlapped (21-26 June), and we did not compare results until we had completed our surveys.

Method	# Observation Sites	ARTE	COTE	Total	Observer(s)
1	14	399 (75 %)	136 (25 %)	535	J. Hudson
2	15	800 (74 %)	287 (26 %)	1087	L. Bernard, K. Devlin

Numbers of Birds Banded (as of Aug. 6, 1999)

Species	Adults	Young
ARTE	253	344
COTE	49	218
ATPU	68	233
RAZO	5	39

- Of the 253 adult Arctic Terns that were banded, 28 were birds that had been trapped previously. Field readable bands were added and the BBL-Band was replaced on 16 of the birds. We captured 64 pairs of Arctic Terns. Trapped birds were resighted at the nest sites during feeding watches, blind stints and from fixed points on the shoreline of the island. It was possible to read the new bands with a KOWA scope with a fluorite lens (capable of focusing as close as 4-8 meters).

Discussion:

How does ARTE productivity this year compare to previous years?
Last year ARTE productivity was .7 chicks per nest and so was COTE. This year the ARTE were a bit lower. COTE production was higher.

Do you have any thoughts if the increased presents in the ARTE colony do to trapping efforts could have lead to lower productivity of ARTE?
I don't think so. Most of the trapping that was done away from our productivity plots.

What age do you consider Puffins successfully fledged?
35 days

CANADIAN WILDLIFE SERVICE - ATLANTIC REGION
SUMMARY OF TERN RELATED ACTIVITIES:
Andrew Boyne

CWS-AR was involved in several tern related projects in eastern Canada in 1999. Prince Edward Island was surveyed for all seabird species; terns, gulls and cormorants. Gull and cormorant numbers have not been collated yet, however terns were found at 5 sites. Tern colonies were identified from the air and were subsequently ground truthed. The results are summarized in the table below. Of the 113 nests counted at the Pownal Bay colony, the largest colony surveyed, 106 were flooded. Two additional colonies had a number of empty nests with evidence of predation (broken shells nearby), and there were far fewer nests than would have been expected by the number of terns flying over the colony. Colonies in PEI tend to be on islands close to the mainland, on sandspits attached to the mainland, or on tidal flats behind barrier beaches. As such they are susceptible to predation and flooding. It appears that the number of terns nesting on PEI has decreased drastically in the last decade.

In Nova Scotia, tern colonies were identified by the Nova Scotia Department of Natural Resources during aerial surveys. CWS visited all colonies over 100 birds, as well as a subset of smaller colonies. Aerial and ground surveys still need to be combined, however since Roseate Terns nest in large colonies of Arctic and Common Terns it is reasonable to assume that our ground surveys would have identified the vast majority of Roseate Terns in the province. Between 116 and 141 pair of Roseate Terns were counted at 8 colonies in Nova Scotia. Five of these sites had not previously been known to support breeding Roseate Terns. Additional Roseate Terns were observed on the Magdellan Islands, Quebec (3-5 pair) , and on Machias Seal Island, New Brunswick (1 pair prospecting). A small number of Roseate Terns also nest on Sable Island, N. S., however this colony was not surveyed in 1999. Thus the total number of Roseate Terns in Canada may approach 150 pair.

CWS was also involved again with its partners, including NSDNR, the Canadian Coast Guard, Dalhousie University, and the Roseate Tern Recovery Team, in implementing the second year of the Country Island Tern Restoration Project off the coast of Nova Scotia. This year the tern colony swelled to the highest number of terns ever recorded (559 pair) and the number of nesting Roseates increased from 1 pair in 1997 and 3 pair in 1998, to 16 pair in 1999. This is still far short of the 45 pair that nested on the island in 1996.

The Country Island Tern Restoration Project will continue next year, and CWS is planning to conduct surveys of tern colonies in New Brunswick and possibly Newfoundland. This would bring our tern surveys up-to-date for eastern Canada. Also of note is the resurrection of the Atlantic Canada Tern Working Group (ACTWoG) which had been defunct for several years but will meet this Fall for a second consecutive year. Anyone interested in attending should contact me at andrew.boyne@ec.gc.ca.

Table 1. Number of nests counted at tern colonies in Prince Edward Island, Canada, 1999, along with the maximum number of nests observed in previous surveys.

Colony	Number of tern nests	
	1999	Max. historic number (year)
Pownal Bay	113	173 (1965)
Indian Point Sandhills	54	355 (1984)
Covehead Harbour	0	97 (1978)
Cascumpec Sandhills	0	546 (1984)
Alberton Harbour	0*	210 (1981)
Hillsborough Bridge	17	231 (1987)
Cavendish Sandspit	45	140 (1987)
Murray Harbour	0	200 (1975)
Eglington Harbour	15	0
Conway Sandhills	0	730 (1984)

* A small number of birds were seen foraging but no colony or nests were found.

Wing Goodale - College of the Atlantic

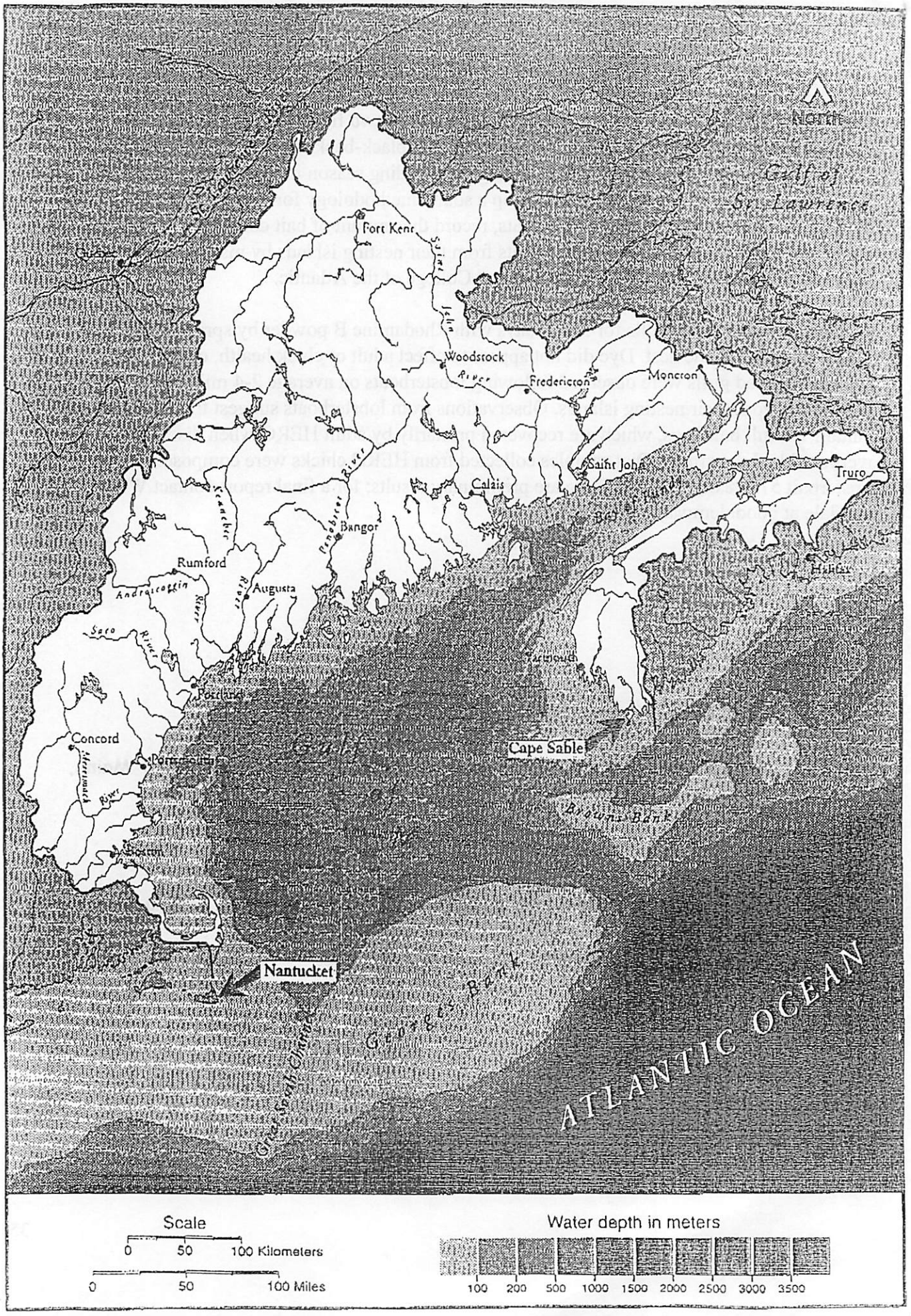
Project Summary: This summer I completed the first of two field seasons (15 May - 25 August) studying how herring gulls (HERG) and great black-backed gulls (GBBG) utilize discarded lobsterbait as a food resource during the breeding season in Upper West Penobscot Bay. The objective of my study is to develop a sound methodology for this research, determine the flock composition foraging behind boats, record the amount of bait consumed by gull chicks, and record how far gulls follow lobsterboats from their nesting islands by marking adults. This research is conducted for my graduate thesis at College of the Atlantic.

Results: I marked adult gulls for 36-43 days with Rhodamine B powder by sprinkling the dye around the edge of the nest. Dye did not appear to effect adult or chick health, or hatching success. Marked gulls were observed following lobsterboats on average 2-4 miles (10 miles maximum) from their nesting islands. Observations from lobsterboats suggest traps on average contain 1/4 full bait bags, which are recovered primarily by adult HERG when discarded overboard by lobstermen. Diet samples collected from HERG chicks were composed of lobsterbait 57.5% of the time. These are preliminary results; for a final report contact Wing Goodale at goodalemw@aol.com.

Attachments:

- Map of the Gulf of Maine
- Estimates of the number of tern & laughing gull pairs in the Gulf of Maine, 1977 - 1998
- 1999 GOMSWG Census island survey results
- List of additional Maine islands surveyed but not supporting nesting terns
- List of August 1999 GOMSWG meeting attendees

Gulf of Maine Watershed



9August 1999

Estimates of the number of tern and Laughing Gull pairs in the Gulf of Maine, 1977 and 1998

Summary of the number of tern pairs and colony sites (in parentheses) by species and state for 1977 and 1998.

	1977[1]					1998[2]				
	COTE	ARTE	ROST	LETE	Total colonies	COTE	ARTE	ROST	LETE	Total Colonies
MA	3,731(16)	33(6)	422(4)	823(14)	26	9,556(18)	6(2)	37(3)	1,509(24)	37
NH	--	--	--	--	0	79(5)	--	--	--	5
ME	2,095(24)	1,640(9)	80(3)	21(2)	31	6,496(21)	2,435(7)	257(5)	86(7)	29
NB[3]	101(1)	1,500(1)	?	--	1 (?)	896(1)	2,089(1)	?	--	1
NS[4]	26+(1)	?	?	--	1 (?)	789 terns (cote/arte)[4]		60(2)	--	4
TOTALS	**5,953(42)**	**3,173(16)**	**502(7)**	**844(16)**	**59**	**17,027(47)**	**4,530(12)**	**354(10)**	**1,595(31)**	**76**

[1] 1977 U.S. data from Erwin and Korschgen, Canadian data from CWS database
[2] 1998 U.S. data from GOMSWG minutes and the Massachusetts tern meeting summary table, Canadian data from ACTWOG summary table
[3] Machias Seal Island count conducted in 1979, 1601 nests – ratio of cote/arte is an estimate based on species ratio from counts in 1974, 1980, 1981.
[4] Canadian counts conducted in the Bay of Fundy to Cape Sable, NS in 1977 and 1998 are incomplete.

Summary of changes in Common, Arctic, Roseate and Least Tern and Laughing Gull pairs 1977 and 1998.

1977 total pairs by species		1998 total pairs by species		% increase/decrease by species	
COTE	5,953	COTE	17,027	COTE	186% increase
ARTE	3,173	ARTE	4,530	ARTE	43% increase
ROST	502	ROST	354	ROST	30% decrease
LETE	844	LETE	1,595	LETE	89% increase
--	--	terns (ratio of cote/arte?)	789	--	--
LAGU	431 (MA –200; ME 231)	LAGU	2015 (MA 498; ME 1517)	LAGU	368% increase
All tern species	**10,472 pairs – 59 sites**	**All tern species**	**24,295 pairs – 76 sites**	**132% increase in total pairs**	

Managed sites 1977 vs. 1998 for Common, Arctic and Roseate Terns (sites were classified as managed if active management for terns was conducted i.e. predator control, fencing, wardens, but not posting alone).

1977: 2,316 of 9,628 pairs nested at managed sites 24.9%
1998: 19,642 of 22,612 pairs nested at managed sites 86.9%

Gulf of Maine Seabird Working Group 1999 Tern Census

MAINE ISLANDS

ISLAND NAME	CIR #	DATE	METHOD	COTE	ARTE	ROST	SPECIES	FLEDGE/NEST	N	SD	METHOD	EGGS/NEST	N	SD	OBSERVER
Machias Seal **	79-367	none			2089		ARTE	0.6	31	0.55	1,2	1.8	33	0.39	DEVLIN/BERNARD
Machias Seal **				896			COTE	1.3	26	0.67	1,2	2.5	26	0.58	DEVLIN/BERNARD
Petit Manan	79-933	15-Jun	N	908			COTE	1.05	61	0.53	1,2	2.35	61	0.56	BRYANT
Petit Manan					580		ARTE	0.5	26	0.51	1,2	1.69	26	0.47	BRYANT
Petit Manan						28	ROST	1.3	27	0.6	3	1.4	27	0.49	BRYANT
Nash Island	79-627	22-Jun	N	1											SCHICK
Dry Money Ledge	59-449	18-Jun	N	45			9 on 7/29								DRURY
Conary's Nub	59-137	17-Jun	N	171								2.2	171		BENEDICT
Ship island	59-341	17-Jun	N	558				0.96	47	0.8	1,2	2.21	47	0.58	AMEY
Buck Island	59-672	16-Jun	VEB	1											ALLEN
Hard Head	59-872	16-Jun	NP	8											ALLEN
Three Bush Island	59-980	18-Jun	N	189			16 on 7/29								DRURY
Great Spoon Island	63-287	18-Jun	N	32			13 on 7/29								DRURY
Wooden Ball Island	63-917	16-Jun	N	0	3										DRURY
Little Green Island	63-418	17-Jun	N	~30	~40		13on 7/20								DRURY
Little Two Bush	63-652	17-Jun	N	1											DRURY
Hog Island	63-588	17-Jun	N	~6	~6		0 on 7/20								DRURY
Metinic (north end)	63-584	10-Jun	N	1	2										CHIPMAN
Metinic (south end)	63-584	17-Jun	N	~38	~70		0 on 7/20								DRURY
Shorebird Ledge	63-099	12-Jun	N	1											DRURY
The Brothers	63-580	15-Jun	VEB	6								2.7	6		BENEDICT
Seal Island	63-923	16,17Jun	N	955			COTE	0.96	23	0.37	2	2.7	23	0.47	BRETON
Seal Island					1082		ARTE	0.9	58	0.45	1,2	1.98	58	0.23	BRETON
Seal Island						1	ROST	1	1	0	3	1	1	0	BRETON
Matinicus Rock	63-940	17,18-Jun	N	102	968	0	ARTE	0.87	61	0.59	1,2	1.88	61	0.41	MARANTO
Eastern Egg Rock	63-860	13,14-Jun	N	1205			COTE	1.07	55	0.7	1,2	2.56	55	0.6	GOODHUE
Eastern Egg Rock			N		91		ARTE	0.2	20	0.41	3	1.9	20	0.31	GOODHUE
Eastern Egg Rock			N			149	ROST	1.24	25	0.6	3	1.84	25	0.47	GOODHUE
Pond Island	73-282	19-Jun	N	10				0.73	22	0.86	3	2.18	22	0.67	PARKER
Jenny Island	55-159	14,15-Jun	N	1129			COTE	1.35	83	0.9	1,2	2.51	83	0.59	CERNEY
Jenny Island		14,15-Jun	N			10	ROST	0.7	10	0.95	3	1.4	10	0.52	CERNEY
Stratton Island	81-002	12-Jun	N	1109			COTE	1.47	83	0.74	1,2	2.65	83	0.55	DODGE
Stratton Island		12-Jun	N		12		ARTE	1.47	12	0.74	3	2.17	12	0.39	DODGE
Stratton Island		12-Jun	N			100	ROST	1.68	45	0.54	1,3	2.02	45	0.4	DODGE
1999 ME COAST TOTAL				**7402**	**4943**	**288**									
1998 ME COAST TOTAL				**7392**	**4524**	**257**									

NH 99

Selected New Hampshire Sites

ISLAND NAME	DATE	METHOD	COTE	ARTE	ROST	LETE	FLEDGE/NEST	N	SD	METHOD	EGGS/NEST	N	SD	OBSERVER
Back Channel Island	16-Jun		0											DELUCA
Seavey Island	20-Jun	N	80				2.24	25	0.76	1	2.84	25	0.37	DELUCA
Hampton Marsh	15-Jun	N&VE	~30				0.25	~30		3				DELUCA
Little Footman Island	15-Jun		6				0			3				DELUCA
Hen Island	15-Jun		0											DELUCA
Nanny	15-Jun		0											DELUCA

Massachusetts Colonies within the Gulf of Maine

Plymouth Beach		N		1										BLODGET
Nauset- New Island		N	2176	2	3									"
Nauset-Orleans		N	495			62								"
Nauset-Eastham		N				40								"
Nauset -Chatham		N				4								"
Gray's Beach		N	953		1	6								"
Central Sq. Pier		N	176											"
Woodbridge Island		N	240											"
Plum Is. River Group		N	8											"
Parker River Group		N	21											"
Plum Is. Beach		N				10								"
Bagwell Island		N	18											"
Rowley Salt Marshes		N	14											"
Lords Island		N	20											"
Ipswich Salt Marshes		N	20											"
Crane Beach		N				220								"
Tinker's Island		N	14											"
Saugus River Bridge		N	42											"
Mystic River		N	9											"
Snake Island		N	24											"
Lovell Island		N				15								"
Rainsford		N				9								"
Hog Island Pier		N	88											"
North R. Mouth		N				44								"
Duxbury Beach		N				2								"
Wood End-Long Pt.		N				10								"
Mission Bell		N	1			43								"
High Head		N				63								"
Plymouth Beach		N		1		45								"

Massachusetts Colonies within the Gulf of Maine (continued)

ISLAND NAME	DATE	METHOD	COTE	ARTE	ROST	LETE	FLEDGE/NEST	N	SD	METHOD	EGGS/NEST	N	SD	OBSERVER
Ellisville Harbor						8								BLODGET
N. Sandwich Area			1			23								"
Scorton Creek						7								"
Sandy Neck						148								"
Marconi Beach						51								"
Pamet Harbor Bar			3			38								"
Great Is. - Jeremy Pt.						83								"
MONOMOYS														
North Monomoy		N	52											KOCH
South Monomoy	16,18-Jun	N	5478				1.6	168	0.82	2	2.41	168	0.631	KOCH
South Monomoy	16,18-Jun	N			27		0.71	28		3	1.48	22	0.511	KOCH
TOTAL: GULF OF MAINE			**17,371**	**4,947**	**319**									
Additional MA colonies:														
BUZZARD'S BAY														
Penikese Island		N	101	6										BLODGET
Bird Island		N	1836		1148									NISBET
Ram Island		N	1887		630									HATCH

**: No survey was conducted on Machias Seal Island in 1999, so 1998 values have been included in the table to allow for comparison to previous years

Methods: N=nest count, NP=nesting pairs (visual estimate), VE=individual birds (visual estimate from island), VEB=individual birds (estimate from boat)
Productivity Methods: 1=feeding study, 2=fenced plot, 3=unfenced plot

Note: Productivity is expressed as the number of fledglings/nest, N=sample size, SD=standard deviation, 15-day old COTE and ARTE chicks are considered fledglings, study chicks found dead after fledge date are subtracted from productivity estimate. ROST chicks were considered fledged based on survival to 10 days and weights during the first few days of life.

Additional Maine Islands Surveyed in 1999 - but supporting no nesting terns

ISLAND NAME	CIR #	DATE	OBSERVER
Squid Island	59-221	17-Jun	Benedict
Colthead Island	59-685	16-Jun	Allen
Grass Ledge West	59-789	16-Jun	Allen
Grass Ledge East	59-802	16-Jun	Allen
Eaton Island Ledge	59-716	16-Jun	Allen
Spectacle Island	59-688	16-Jun	Allen
Dagger Island	63-015	16-Jun	Allen
Pond Island	59-677	16-Jun	Allen
Thrumcap Island	59-669	16-Jun	Allen
Pond island	55-615	17-Jun	Cerney
Ram Island	55-605	17-Jun	Cerney
Bonney Chess		16-24 Jun	Schick
Eastern Island		16-24 Jun	Schick
Sally Island		16-24 Jun	Schick
Bald Rock		16-24 Jun	Schick
Sheep Island		16-24 Jun	Schick
Outer Bar		16-24 Jun	Schick
Big Black Ledge		16-24 Jun	Schick
Schoodic Island		16-24 Jun	Schick
Moose Island		16-24 Jun	Schick
Egg Rock		16-24 Jun	Schick
Rum Key Island		16-24 Jun	Schick
Bald Rock		16-24 Jun	Schick
Night Cap Island		16-24 Jun	Schick
Norton Is. Ledge		16-24 Jun	Schick
Pot Rock		16-24 Jun	Schick
Ladle Ledges		16-24 Jun	Schick
Big Nash Island		16-24 Jun	Schick
Flat Island		16-24 Jun	Schick
Black Rock		16-24 Jun	Schick
Sheldrake & Goose		16-24 Jun	Schick
Inner & Outer Sand		16-24 Jun	Schick
Stanley Ledge		16-24 Jun	Schick
Seaduck Rock		16-24 Jun	Schick

ISLAND NAME	DATE	OBSERVER
Norton Ledges	16-24 Jun	Schick
Pomps Is. Ledge	16-24 Jun	Schick
Browney	16-24 Jun	Schick & Schaeffer
Fisherman	16-24 Jun	Schick & Schaeffer
Egg, Seal & Curlew	16-24 Jun	Schick & Schaeffer
Crumple Island	16-24 Jun	Schick & Schaeffer
The Nipple	16-24 Jun	Schick & Schaeffer
Virgin Island	16-24 Jun	Schick & Schaeffer
Gilchrist Rock	16-24 Jun	Schick
Seguin Island	16-24 Jun	Schick
Ballast Island	16-24 Jun	Schick
Little Sheep	16-24 Jun	Schick & Schaeffer
Sheep Island	16-24 Jun	Schick & Schaeffer
Spectacle Island	16-24 Jun	Schick
Green Island	16-24 Jun	Schick & Schaeffer
Calf Island	16-24 Jun	Schick
Mink Island	16-24 Jun	Schick & Schaeffer
Man Island	16-24 Jun	Schick
Freeman Rock	16-24 Jun	Schick & Schaeffer
Popplestone Ledges	16-24 Jun	Schick
Halifax Island	16-24 Jun	Schick & Schaeffer
Shag Ledge	16-24 Jun	Schick & Schaeffer
Scabby Island	16-24 Jun	Schick & Schaeffer
Ram Island	16-24 Jun	Schick & Schaeffer
Foster Island	16-24 Jun	Schick & Schaeffer
Green Island	16-24 Jun	Schick & Schaeffer
E&W Brothers	16-24 Jun	Schick & Schaeffer
Shag Rock	16-24 Jun	Schick & Schaeffer
Pulpit Rock	16-24 Jun	Schick & Schaeffer
Libby Islands	16-24 Jun	Schick & Schaeffer
Double Head Shots	16-24 Jun	Schick & Schaeffer
Old Man	16-24 Jun	Schick
Roque Island	16-24 Jun	Schaeffer
Anguilla Island	16-24 Jun	Schaeffer

Additional Maine Islands Surveyed in 1999 - but supporting no nesting terns (Continued)

ISLAND NAME		OBSERVER
Egg Rock		Drury
Shabby Island		Drury
Gooseberry Island		Drury
Halibut Rocks		Drury
Saddleback Ledge		Drury
Green Ledge		Drury
Southern Mark Is.		Drury
Black Horse Island		Drury
White Horse Island		Drury
Little Spoon		Drury
Mason Ledge		Drury
Spirit Ledge		Drury
Brimstone		Drury
John's Island		Drury
W. Green Island		Drury
E. Green Island		Drury
Poplestone Ledge		Drury
Harbor Island Knob		Drury
Green Island		Drury
Criehaven Island		Drury
Camp Cove High L.		Drury
Camp Cove Ledge		Drury
Green Ledge		Drury
Pudding Island		Drury
Shag Ledge		Drury
Ten Pound Island		Drury
Two Bush Island		Drury

ISLAND NAME		OBSERVER
No Man's Land		Drury
Saddleback Ledge		Drury
Large Green		Drury
Metinic Green		Drury
Little Roberts Island		Drury
Roberts Island		Drury
Green Ledge		Drury
Sheep Island		Drury
Carvers Island		Drury
Hay Island		Drury
Otter Island		Drury
Little Brimstone		Drury
Little Hurricane		Drury
Dead Man's Ledge		Drury
Tobbacco Juice		Drury
Medric Rock		Drury
Two Bush Island		Drury
Yellow Ridge		Drury
Clam Ledge		Drury
Hurricane Island		Drury
Oak Island		Drury
Little Green Island		Drury
Gooseberry Knob		Drury
Crescent Island		Drury
Marblehead Island		Drury
Fisherman's Island		Drury

CIR # for these islands were not readily available, however I will obtained them prior to the 2000 census