

GOMSWG MINUTES – 2011

Welcome and Introductory Remarks: Dr. Stephen Kress, National Audubon Society, Seabird Restoration Program

2011 marked the 27th meeting of the Gulf Of Maine Seabird Working Group (GOMSWG.) The first GOMSWG meeting was held in 1984 when a small group of individuals met in Bangor to develop a conservation plan for terns in Maine. Populations had been declining for 50 years and predation by large gulls was identified as the primary cause. As a result of these insights, management efforts began on several Maine islands. Following each field season, interested individuals convened on Hog Island to share the results of the season and discuss future plans.

At the start of this year's meeting Steve provided some background on Hog Island and the surrounding region. The Island has been home to the Audubon camp in Maine since 1936 and is still owned by the National Audubon Society. Difficult financial times have necessitated the development of new partners, including Camp Kieve and others. According to the attendance sheet 42 individuals attended the GOMSWG meeting this year.

Today's activities involved island reports from Canada to Massachusetts followed by six afternoon presentations.

ISLAND REPORTS

Machias Seal Island

Kevin Kelly and Tony Diamond, University of New Brunswick

Summary

The food supply at MSI this summer was abysmal for Herring, and the dominant prey items were Euphausiids, Hake and an unidentified fish that we believe may have been Haddock.

We did a partial census of puffin nests in early June this year, marking 2 meter X 2 meter quadrats, every 5 meters, following the 30 meter grid lines on the island. Extrapolating from the number of nests found and occupancy rates in them we have a rough estimate of 6,500 breeding pairs of puffins on the island.

Bird highlights for this summer included a Great Cormorant roosting on nearby Gull Rock for a few weeks in June and Northern Gannets landing and loafing on the western shoreline of MSI, almost daily, starting in early July.

Terns

This year marked the seventh consecutive year with no fledged terns on MSI. There were a total of 33 nests found in marked plots this year, down from last year. No tern census was done, but the estimate of total nests was 300-500 based on the numbers seen around the island. Courtship behavior started in mid-May and the first egg was found on June 2nd. Once egg laying began the colony was never fully comfortable on the island, but they were seen dive bombing gulls over the colony on multiple occasions and incubating throughout the day. The behavior changed on the evening of June 15th when two Peregrine Falcons were seen on the north end and the terns abandoned their nests until dark. The terns continued this trend, leaving at first light and coming back after dark. Virtually all the eggs were gone within a week of the initial abandonment and no relays were seen this year. Terns were still seen daily, but by the end of June the groups were less than 10 at a time.

Food

Atlantic Puffin chick diets consisted of: 40.7% Euphausiids; 19.8% Hake; 10.4% Unidentified Fish believed to be Haddock; 6.0% larval fish; 2.4% sandlance; 1.8% each of Butterfish, Polychaetes and Squid; and only 0.5% Herring. Fish were larger and more prevalent earlier in the season and Euphausiids became more numerous as the season carried on. Euphausiids numbers may be deceptively high in this context since often bill loads of 10-20 Euphausiids were seen. The proportion of bill loads containing Euphausiids compared to the number of bill loads containing other prey items would likely give a different picture, but we don't have those numbers right now.

Razorbills were better able to find Herring, but it was only 39.6% of their diet. Other notables in their diet this year were Hake 11.1%, Euphausiids, 4.6%, Sandlance 3.2%. The rest was made up of unidentified fish and larval fish.

Predators

Gull scaring is still done by researcher presence, firing noise makers and occasionally non-lethal shooting with a pellet gun. Noise makers haven't been used much in the past two seasons to minimize tern disturbance, but a more aggressive approach with them will likely be taken next year due to the increased presence of gulls around the island this year. Fifty-six nests on nearby Gull Rock were destroyed over 4 visits, and 8 nests were found and destroyed on MSI itself.

Raptors this season were less prevalent than last season. Peregrine Falcons were again a presence on the island early in the season, and likely contributed heavily to the abandonment of nests by the terns. They were only seen on the island on 11 days, down considerably from 54 last year. Other raptors seen were Merlins, Northern Harriers and Bald Eagles, but only a few days each.

Maine Islands

Eastern Brothers Island

Andre LaCoste – Island Supervisor, Jesse Warner

This was the 5th year of efforts to establish a new tern and alcid breeding colony on Eastern Brothers Island in Jonesport, Maine. The 17 acre island is currently utilized by black guillemots, common eiders, and Leach's storm-petrels.

Black Guillemots

A gull distress sound system (BirdGard) was not used this spring to deter gull nesting and loafing. The Refuge was concerned that in addition to mink predation over the last several years, the BirdGard sound system was contributing late BLGU nest initiation. We observed a season high count of 380 guillemots adjacent to the island on June 1st. We observed very few signs of predation this season, and believed that peregrine falcons preyed on a small number of black guillemots. We counted an average of 244 guillemots during our morning counts. We believe a peregrine falcon killed a total of five BLGU adults and that gulls/ravens dispatched 20 BLGU eggs. Compared to prior years, the BLGU breeding population on Eastern Brothers declined by approximately 50%, and 44% of the nests failed due to predation by gulls or ravens. Only 39 of 70 burrows contained eggs or chicks by the end of July compared to an estimated 200 active nests in 2009.

Predator control

Refuge staff visited the island on March 23rd and observed fresh mink tracks in the snow. Conibear traps were set on Eastern and Western Brothers Islands, and an adult mink was trapped in April. Proactive predator control efforts (tube traps and 110 conibear traps) were maintained throughout the season on both islands. No additional signs of mink were observed this season, and no birds or other prey were found cached on either island.

Terns

A tern sound system, 51 tern decoys, and an electric fence to protect the tern nesting area from sheep were deployed on May 15, 2010. Sheep grazed Eastern Brothers year-round for the second year since the mid-1990's and vegetation height and density across the island has been considerably reduced. The first common tern was observed on May 18, but no terns initiated nesting this season. Small groups of 2-4 terns were seen throughout the season. Only one adult COTE remained long-term, and was frequently seen loafing, foraging, and attempting to feed herring and butterfish to decoys, then consuming the fish.

Alcids

One hundred alcid decoys were placed along cliffs on March 23rd. In late May an alcid sound system was added to one of the decoy areas on the eastern end of Eastern Brothers. Small numbers of RAZO were regularly seen foraging near the island though no birds were observed interacting with decoys this year. Up to 18 RAZO were seen >200 yards from shore and puffins (max of 6) were seen on seven occasions. A solitary puffin was also seen on several occasions foraging just southeast of the rocks near E decoys, and was sometimes seen coming up among the decoys, predominantly in the morning watch.

Petit Manan Island

Andrew Allyn – Island Supervisor, Christa DeRaspe, Jordan Chalfant, Morgan Burke

Census

We conducted the GOMSWG census on 21 and 22 June 2011. We counted 1,650 tern nests, yielding a total of 1,696 nests after applying a Lincoln Index of 1.03%. Our tern census estimate was 3% higher than the 2010 season estimate (1,595 nests); total tern nest numbers remained considerably lower than the 2009 census estimate (2,642 nests). During the summer we identified 47% of all tern nests to species (791 nests). The tern colony consisted of 67% Common terns (531 marked nests) and 33% Arctic terns (260 marked nests), yielding estimates of 1138 Common Tern nests and 558 Arctic Tern nests. Although a single Roseate Tern was observed in the intertidal zone on the east side of the island, we did not observe any evidence of Roseate Terns breeding on the island. Additionally, we counted 735 Laughing Gull nests resulting in a total estimate of 845 nests after applying a correction factor of 15%. Finally, 35 Common eider nests were counted during the census.

Petit Manan Island						
	2006	2007	2008	2009	2010	2011
COTE						
# of Nests	1601	1343	1307	1374	912	1138
Mean Clutch Size	2.04	1.70	1.83	1.93	1.7	1.72
Mean Hatch Success	78.0 %	64.8 %	85.3 %	85%	47.9 %	72.3%
Mean Fledge Success*	74.4 %	76.7 %	71.6 %	56%	31.0 %	40.6% (36.1%)
Mean Chicks Fledged/Nest*	1.18	0.76	1.12	0.90	0.43	0.47 (0.40)

ARTE						
# of Nests	779	1038	1255	1268	688	558
Mean Clutch Size	1.99	1.53	1.55	1.68	1.6	1.46
Mean Hatch Success	83.6 %	51.9 %	75.3 %	78.0 %	21.6 %	56.8%
Mean Fledge Success*	52.9 %	62.8 %	81.3 %	54%	20%	29.5% (24.5%)
Mean Chicks Fledged/Nest*	0.84	0.45	0.95	0.70	0.21	0.27 (0.22)

ROST						
# of Nests	22	5	4	4	2	0
Mean Chicks Fledged/Nest	0.78	0.20	1.00	0.20	0.00	0

LAGU nests	1282	1350	1363	1171	270	845
ATPU nests	70	53	93	104	88	67
COEI nests	138	49	105	101	56	35

* Estimates in parentheses include data from chicks that died after the 15-day GOMSWG fledgling criteria

Tern Productivity

Productivity for both tern species was relatively low this year, with a mean of 0.47 chicks fledged per nest for Common Terns and 0.27 for Arctic Terns. These productivity estimates were considerably lower than 2009 estimates, and were relatively similar to 2010 estimates, which was characterized as a poor reproductive year for terns because of disturbance and predation by Peregrine Falcons. However, the relatively high mean hatching success for both species in 2011, combined with provisioning studies, suggested that poor food quality or availability had a larger influence on overall productivity than disturbance or predation in 2011. Finally, including data from chicks that died after the 15-day GOMSWG fledgling criteria lowered Common Tern productivity estimates by 13.8%, to 0.40 chicks fledged per nest and lowered Arctic Tern productivity estimates by 17.4% to 0.22 chicks fledged per nest.

Tern Provisioning

We followed 9 Common Tern nests and 11 Arctic Tern nests over 190 hours. During this time, we observed 792 prey deliveries. Of the 792 prey deliveries, 127 deliveries were recorded as “not eaten”, when the prey item, usually Butterfish, could not be swallowed or was refused by the chick. Butterfish was the primary prey delivered to both Common Tern (40.7%) and Arctic Tern (53.7%) chicks. On average, Common tern adults delivered 3.7 prey items per hour and Arctic tern adults delivered 4.4 prey items per hour. In nests with two or more chicks, prey deliveries were made to first hatched Arctic Tern chicks 77% of the time and 53% of the time prey deliveries were made to Common Tern first hatched chicks.

Diet Item	% COTE diet	% ARTE diet
Butterfish	40.7	53.7
Atlantic herring	11.4	9.6
Unidentified Prey “A”	3.0	7.9
Insects (moth, dragonfly, etc.)	7.2	4.3
Sand lance	1.1	1.9
Stickleback	0.3	2.6
Bluefish	2.3	1.2
Other	3.0	1.4
Unknown	30	15.2

Arctic Tern Metapopulation Project

As part of the Arctic Tern metapopulation project we re-sighted 136 adult Arctic terns. Additionally, we trapped and banded 42 adult Arctic Terns and 64 Arctic Tern chicks.

Predator Control

Our predator control efforts were mainly focused during the month of May and during the census. Peregrine Falcons were the most frequent visitors to the colony throughout the season. During the

month of May we discouraged the Peregrine Falcons and other avian predators from perching on the island using bird deterrents. We took a less active role once terns began establishing nests in late May and early June. The terns appeared to adequately deter Peregrine Falcons and other avian predators (e.g., Northern Harrier, Common Raven) from perching on the island by grouping together and chasing the predator. During the census, we poked the eggs of 612 Laughing Gull nests and destroyed 123 Laughing Gull nests. We also shot 10 adult Laughing Gulls, 1 Herring Gull and 2 Great Black-backed Gulls.

Alcids

The highest alcid counts for the season were 226 Atlantic Puffins (12 June), 95 Razorbills (10 June), 15 Common Murres (23 June) and 263 Black Guillemots (15 May). We estimated the breeding population of Atlantic Puffins was 67 pairs based on the number of active burrows (i.e. burrows with either an adult, egg or a chick). This estimate was much lower than the 2010 estimate of 89 breeding pairs. Puffin productivity was 0.52 chicks per burrow. We documented five active Razorbill burrows in 2011; two chicks successfully fledged. Although Common Murres were observed loafing on the island, there was no evidence of Common Murres breeding on the island. Lastly, we estimated that the Black Guillemot breeding population was 52 pairs, with an overall productivity of 1.06 chicks per burrow. We re-sighted 125 individual Atlantic Puffins this field season. We banded 44 puffins this summer (24 adults and 20 chicks) and recaptured 8 adults. Finally, we banded 32 Black Guillemots (4 adults and 28 chicks) and recaptured 2 adults.

Other Research

We collected blood samples from adult terns, Atlantic puffins and Black Guillemots to monitor avian health. Additionally, Refuge SCEP student Chelsea DiAntonio characterized Black Guillemot nesting habitat and banded adults and chicks with plastic field readable bands for a senior capstone project (Paul Smiths College).

Ship Island

Lisa Harn, Nathan Elliott

Background

For the second year in a row, Ship Island supported a successful colony of Common Terns (*Sterna hirundo*) in 2011. Ship Island was managed by Maine Coastal Islands NWR for terns from 1993-2005 until mink predation in 2005 caused colony failure. For four years during this period, Ship Island was one of the more successful coastal tern colonies. In 2010, staff returned to monitor the colony and protect it from predators such as gulls, mink, and owls.

Census

Ship Island was monitored by a two-person crew from May 12-July 29. A complete census was conducted on June 22. The GOMSWG window tern count for Ship was 102 active nests (204 terns) and 39 nests that were abandoned around June 15, possibly corresponding to a predation event (bird of

prey suspected). A Lincoln correction factor was not needed or applied. In late June a season high of 220 terns were observed, although 149 pairs (298 terns) were probably present based on the total number of active nests found.

Nesting

The first tern nests were located on June 2, though one clutch already contained three eggs. The last nest was found on July 26. At the time of the crew's departure on July 29, there were 40 abandoned or failed nests, 105 hatched nests, and 44 nests whose fate was unknown. For all nests documented throughout the season, 40 had one egg, 82 two eggs, 64 three eggs, 2 four eggs, and 1 five egg. Sixty percent (24) of abandoned nests were one egg clutches, 20% (8) two egg clutches and 20% (8) three egg clutches.

Productivity

The first nest hatched on June 28 and 105 nests had hatched by the time the crew departed. Productivity plots were not erected this year. Instead, the crew checked every nest and chick they could find every other day throughout the season though vegetation made finding some chicks difficult. The productivity numbers reported are the best estimates of colony success available. Of the 227 chicks that hatched, 54 were found dead and 46 had reached day 15 (fledged) by the end of the season (July 29). Among active GOMSWG nests, 0.451 fledglings (SD 0.816) were produced per nest. Looking only at GOMSWG nests that hatched 15 days or more before the crew's departure, 0.575 fledglings (SD 0.883) were produced per nest.

Provisioning

We observed 487 feedings. Herring accounted for 24% of feedings; pollock 18%; sandlance 17%; unknown fish 14%; stickleback 11%; unknown larval fish 6%; unknown 5%; other types of fish 2%; and invertebrates 1.5%. Early in the season (prior to July 20) feedings were dominated by herring (30%), pollock (25%) and sand lance (20%) with fry (1.5%) and sticklebacks (3%) constituting a very small portion of feedings. In the second half of the season (after July 20), a decrease in herring (20% of feedings), pollock (10%) and sandlance (15%) corresponded to increases in fry (12%) and sticklebacks (20%) being fed. Butterfish were observed being fed to chicks only twice.

Predator Control

Despite signs of mink found early in the season on neighboring Trumpet Island, no mink were found on Ship in 2011. Mink traps were set early in the season and checked daily. Early in the season gulls loafed along the beach in and near the colony. One HERG and one GBBG were shot and displayed, after which gull presence abated. Peregrine falcons (*Falco peregrinus*) were only observed in the first few weeks of the season, and were not observed successfully preying on terns. Their absence later in the season may be explained by the nesting failure on Mount Desert Island. A Great Horned Owl (*Bubo virginianus*) visited the island several times in June and July. Owl traps were set on July 30 and monitored daily. The owl was captured on July 20 and relocated to north western Maine (Caratunk).

During the season only two tern kills (probably PEFA or GHOW) were located, and no successful predations were observed.

Foraging Directions

Adult terns were observed foraging in all directions from Ship Island, though several trends did occur. The greatest numbers of terns were observed foraging to the Northeast, Northwest and Southeast. Few terns were observed foraging to the North.

Seal Island National Wildlife Refuge

Island Supervisor: Sarah Gutowsky, Resident Intern: Jenny Howard

The birds on SINWR benefited from much better weather this year than last, but were hurt by a poor food supply early in the season. This season's tern census indicated that colony growth is stable; however this is likely a reflection of our limited census excluding new expansion areas. The puffin colony has continued to grow, and a new reduced census method was developed throughout this season in order to address the impracticality of continuing to conduct a complete census.

Tern Census

Due to safety concerns on the island, a complete tern census was not performed in 2011. However, a partial census was conducted on June 16th, (14 of 30 marked grid squares were counted). The total number of nests in these areas has been determined to consistently represent, on average, 57% of the total nest number of the colony over the last eleven years in which a complete census was performed (1996-2006). Arctic Terns have continued to expand into the southern periphery of the main colony, and including an additional grid square in this area should be considered for future census protocols. The total estimated number of nests was 3,038 (after a Lincoln Index of 1.019 was applied), compared with 3,026 nests in 2010. Species ratio was determined by marking a circle with a radius of 16 meters around 7 blinds and identifying as many nests to species as possible within that radius, in addition to the known species nests within 5 mixed species productivity plots.

Table 1. Number of nests per species from 2006-2010 (2007 numbers are from the second census, conducted just before hatch).

	2007	2008	2009	2010	2011
Arctic Tern	823	1,084	991	1,238	1,201
Common Tern	1,005	1,283	1,580	1,788	1,836

Roseate Tern	0	0	0	2	0
Laughing Gull	0	0	0	0	0

Tern Productivity

Mean hatch was found to be 1.8 and 1.3 for Common and Arctic Terns respectively, and nearly the same values were found in 2010. COTE and ARTE productivity in 2011 were both higher than 2010 but on the lower end for the past 20 years. Terns brought their chicks mostly large butterfish early in the season, which the chicks were unable to eat, and many died from starvation.

Table 2. Number of tern chicks fledged per nest from 2006-2010.

	2007	2008	2009	2010	2011
Arctic Tern	0.67	0.93	0.74	0.53	0.74
Common Tern	0.66	1.11	1.07	0.53	0.77
Roseate Tern	-	-	-	0.50	-

Tern Feeding

12 Arctic Tern nests and 6 Common Tern nests were watched for a total of 141 hours. COTE feeding rate was found to be 1.89 feedings/hour, and ARTE feeding rate was 1.78. COTE chick diet was composed mostly of butterfish and euphausiids, while ARTE chick diet was composed mostly of hake, butterfish and amphipods. The high proportion of butterfish and invertebrates provided to both COTE and ARTE chicks resulted in large numbers of starved chicks.

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

	Euphausiid	Amphipod	Butterfish	Hake	Herring
Arctic Tern	13.67	21.46	21.97	23.75	3.19
Common Tern	48.22	0	11.53	6.29	7.76

Predation and Klepto-parasitism

Laughing Gulls klepto-parasitized terns consistently through the season, and terns also klepto-parasitized Atlantic Puffins regularly through mid-July to August. A Merlin and a Peregrine Falcon both visited the island sporadically through July and August and took a single chick or adult each of 5 times.

Gull predation upon terns in 2010 was not severe. A Greater Black-backed Gull depredated 2 adult Atlantic Puffins in late May and was subsequently swiftly dispatched.

Table 4. Gull control measures in 2011 by species.

	# Nests Destroyed	# Shot
Herring Gull	139	2
Great Black-backed Gull	14	1
Laughing Gull	0	9

Atlantic Puffins

A new reduced census method for Atlantic Puffins was developed this season. Burrow status was determined for 87 burrows within 15 plots of 3 m radius spaced 25 m apart throughout the main colony in Area 1, and for 97 additional burrows outside of the main colony. 81% of these burrows were found to be active, which reflects the colony trend over the past 20 years. Extrapolation of these plots to the entire colony is currently under discussion. Our high count of puffins was 646, which was down from 746 in 2010. Puffin productivity was estimated to be 0.73 chicks/pair (sample size = 66 active burrows) as compared to 0.77 chicks/pair in 2010. Puffin chick diet was monitored for 10 burrows at each of 2 blinds for a total of 88.8 observer hours. Chick diet was composed of 34.31% hake, 12.94% euphausiids, 10.08% butterfish and 24.29% unknown fish. The high proportion of unknown fish is due to a combination of inexperienced observers and the prevalence of 2 new, as-of-yet unidentified fish species that were prevalent in puffin chick diet during the latter half of the season. Two geo-locator units deployed on adult puffins in 2009 were retrieved using a box trap, and 6 more units were deployed at the end of this season.

Black Guillemots

This year was the fifth year that Black Guillemot productivity was tracked on the island. Chick growth was not monitored due to unforeseen insufficient staffing and consequential time constraints this season. Productivity was determined to be 0.56 chicks/pair (sample size = 39), which was up from 0.5 chicks/pair in 2010 but still low for the past 5 years. Guillemots again laid later than normal this year. Many chicks were found dead outside of their burrows and many pairs seemed to stop incubating in late June/early July.

Razorbills

A total of 13 active Razorbill burrows were found on the island this year, which is down from 19 last year. Hatch success was 0.67, which was slightly higher than 0.63 in 2010.

Common Eiders

A total of 56 nests were counted in early June, although their main nesting area (Area 4) was not counted to minimize disturbance to the birds.

Great and Double-crested Cormorants

The cormorant colony on the western end of the island was counted by boat to minimize disturbance to the birds (see John Drury's GOMSWG report).

Bird Sightings

A Red-billed Tropicbird was seen on the island for the seventh year in a row. It was first sighted on May 25 and was last sighted on August 9th. It was seen on 56 days throughout the summer – up from 50 days last year – and was again seen loafing under a boulder in Area II.

Matinicus Rock NWR

Nathan Banfield, Co-Supervisor

Caroline Poli, Co-Supervisor

During the 2011 season Matinicus Rock received 7.64 inches of rain. Our average temperature was 59.5 degrees F and our average sea surface 53.3 degrees F.

Tern Census

1117 tern nests were counted during census (June 19-21). 859 of these were Arctic Terns and 258 were Common Terns for a species ratio of 77% ARTE and 23% COTE. Our Lincoln Index correction factor was 1.056.

Laughing Gull Census

This is the second year since 2004 that we observed a decrease in Laughing Gull nests. Heavy culling seems to be having an effect on the LAGU population, but the birds may be immigrating to Eastern Egg Rock. The 778 nests counted this year represent a 19% drop from last year, however, as part of our 2011 LAGU management plan, 54 nesting adults were shot in the two weeks prior to census.

Productivity

Arctic Terns fledged 0.54 chicks per nest. This is .15 chicks per nest lower than the 17-year mean but still good compared to the previous seven years. Mean clutch was 1.60 for 72 nests.

Common Terns fledged 1.06 chicks per nest. This is .31 chicks per nest higher than the nine-year mean. Mean clutch was 2.18 for 34 nests.

Predation by gulls was a major factor in this year's low productivity, with Laughing Gulls preying opportunistically on tern eggs and chicks throughout the season. We found that productivity was lowest in plots where LAGUs and terns nested in close proximity (0.06) and highest where terns nested among other terns or in LAGU-free areas (.88 and .89). Predation by Herring and Great Black-backed Gulls was less prevalent than in 2010.

Poor quality food was the significant factor in overall low productivity.

Atlantic Puffin hatch success for control/geolocator birds was 0.71/0.65 (n = 56/17) and productivity was 0.64/0.53 (n = 55/17). The reduced productivity of geolocator birds can be explained by small sample size and potential for egg damage during recapture. Productivity of control birds is similar to previous years. We banded 214 chicks this year and re-banded 18 adults. Eight new geolocators were deployed late-season for our ongoing wintering study.

Razorbill hatch success was 0.74 (n = 53), and productivity was 0.58 (n = 53). To reduce disturbance to the colony, we did not complete a census. The census window coincides with peak incubation, and we suspect that prolonged disruption during this critical period causes nest failure. Gull activity in the colony was high throughout the season. Ravens were also observed moving throughout the colony and most likely were a factor.

Leach's Storm Petrel hatch success was 0.76 (n = 72). This is low compared to the 5 year average of 0.9.

Black Guillemot productivity was 0.25. Laying was late compared to last year and fledge success for B chicks was very low, at 0.2.

Manx Shearwaters were seen on the water in groups of as many as 10 regularly throughout the season and heard calling on 44 out of 77 nights. On August 6th we found four large downy chicks in burrows known to be active.

Feeding Studies

Arctic Tern feedings were 46% hake, 19% butterfish, 18% unknown prey, and 10% invertebrate. The average feeding rate was 1.35 deliveries/hour.

Common Tern feedings were 33% butterfish, 27% hake, 4% invertebrate, and 16% unknown. The average feeding rate was 1.31 deliveries/hour.

Additional Common and Arctic Tern prey items included Pollock, haddock, rough scad, mackerel, lobster, moth, Atlantic saury, herring, lumpfish, stickleback, snipefish, squid, rock eel, and sand lance in small quantities.

Puffin bill-loads consisted of 44% hake, 23% *Sebastes norvegicus* *Ascanius* (rosefish, NOT black-bellied), 11% sand lance, and 6% haddock. This season, we identified three "new" fish: *Sebastes norvegicus* *Ascanius* (rosefish), *Trachurus trachurus* (rough scad), and *Melanogrammus aeglefinus*

(haddock). These species have been observed in previous years but were likely recorded incorrectly or simply as “unidentified.”

Razorbill feedings were 44% butterfish, 27% hake and 18% herring. Herring, commonly seen in early June, was replaced almost entirely by butterfish as the season progressed.

Gull Control

Laughing Gulls

During census, all eggs in 778 nests were poked to prevent hatching. An additional three nests were destroyed outside the census period. 122 adult Laughing Gulls were shot throughout the season, with effort concentrated on parts of the island where LAGUs and terns nested in close proximity to each other.

Herring Gulls and Great Black-Backed Gulls

No Herring Gull or Great Black-backed Gull nests were found this year. Adults killed included 6 Herring Gulls and 2 Great Black-backed Gulls.

Unusual Birds

A **Prothonotary Warbler** was observed on August 10 and 11. Photographs were taken.

Our high count for **Common Murres** was 153. No eggs were observed this year.

Metinic Island

Charles Walsh – Island Supervisor, Jennifer Waicek - Island Technician

Census

The Gulf of Maine Seabird Working Group (GOMSWG) census was started on June 17, 2011, and finished on June 20, 2011. The total of 498 tern pairs nested on the North End of Metinic Island in 2011 (raw count of 484 with a Lincoln Index of 1.029), two thirds of last year’s population. We identified 61% of the nests to species (307 of 498 nests). The species ratio was 40% common terns and 60% Arctic terns (185 COTE and 122 ARTE nests). The South End of the island is privately owned and was surveyed by boat, 2 pairs of Terns were present, but no nests were confirmed.

Metinic Island					
	2007	2008	2009	2010	2011
COTE					

# of Nests	338	303	387	406	300
Mean Clutch Size	2	2.17	2.37	2.32	2.19
Mean Hatch Success*	75%	85%	87%	84%	89% (81%)
Mean Fledge Success*	56%	81% (71)	47% (41)	44% (35)	68% (66%)
Chicks fledged/Pair*	0.8	1.49 (1.09)	1 (0.8)	0.85 (0.70)	1.23(1.08)

ARTE					
# of Nests	321	409	393	352	198
Mean Clutch Size	1.7	1.61	1.75	2.32	1.45
Mean Hatch Success*	67%	83%	81%	84%	36% (35%)
Mean Fledge Success*	38%	80% (59)	50% (41)	37% (35)	43% (37)
Chicks fledged/Pair*	0.4	1.11 (0.97)	0.81 (0.64)	0.32 (0.29)	.23 (.22)

ROST					
# of Nests	0	0	0	1	0
Chicks fledged/Pair	-	-	-	0	-

South End					
ARTE and COTE nests	2	9	1	2	2**

*when available, data in parenthesis includes fledglings later dead after the GOMSWG fledge date of 15 days

**Unconfirmed

Productivity

Fledging/reproductive success was low this year for Arctic Terns (under the 1 chick/nest USFWS goal), but Common Tern productivity improved from last year. The Arctic Terns suffered from widespread predation events early in the season which resulted in the loss of many eggs and young chicks. Large Garter Snakes are thought to be partially responsible. Great Black-Back Gulls were witnessed flying out of the area during the day, and a herring gull was seen leaving and trying to enter the same area during a night watch.

Provisioning

We were able to follow 6 Common Tern and 8 Arctic Tern nests throughout the season, for a total of 96 observational hours and 599 feedings. COTEs fed at an average rate of 1.6 feedings/hour, while ARTEs fed at .7 feedings/hour. Both Arctic and Common Terns delivered Atlantic Herring most frequently to their chicks consisting of about 55% and 30% of their diet respectively. Butterfish was the next most frequent delivery for both species, making up about 30% of deliveries. Herring deliveries gradually declined and butterfish deliveries gradually increased as the season progressed. Feedings overall slowed considerably starting in the third week of July especially for Arctic Terns.

	# of Provisioning Nests	Avg. Feedings/ Hour	Herring	Butterfish	Pollock	Invert	Unkown
COTE	6	1.6	38.6%	29.9%	7.0%	1.1%	17.1%
ARTE	8	0.7	54.8%	33.3%	0%	6.3%	2.8%

Predators

- A pair of Merlin nested on Metinic this year and removal attempts were unsuccessful. The Merlin were seen hunting songbirds and shorebirds early in the season then were absent for several weeks. They started actively hunting within the colony after the second week of July.
- Owl feathers were found in the colony on two occasions. We did not observe nocturnal abandonment. Padded leg hold traps were erected on two separate perches, yet the owl was never seen or caught.
- Gulls: eggs from 95 Herring gull nest and 2 Great Black-backed gull nests were punctured, 68 nests were empty during the census. No LAGU nests were found, though there were up to 5 LAGU seen near the colony at a time. One LAGU seen copulating in the intertidal was removed.
- Great Black-backed gulls were noted at the beginning of the season flying low over and hanging around the colony. Two were shot, one of which was displayed in the colony.
- Herring Gulls were responsible for the death of at least 2 Tern fledglings, and predating many nests. Four HEGU were shot with all displayed in the colony. Four additional HEGU with broken wings were removed.
- Three Large Garter Snakes found within productivity plots were lethally removed after suspicion of predation of day old chicks. This suspicion was confirmed by a young chick in the gut contents of a snake >30 inches long.

Guillemots

We monitored 32 guillemot nests and recorded a hatch success of 62% and egg depredation rate of 12.9%. This data is not a complete set because of the number of guillemots incubating through all checks (incubating birds were not disturbed). Three adults were still incubating at the end of July, so hatch success could be higher than calculated. 19 chicks were found and 14 were banded, weighed, and measured.

Petrels

We discovered 53 Leach's Storm-petrel burrows early in the season however only 7 were noted to have eggs or adults present at the end of July. At the end of our field season, 17 burrows were no longer active and 29 still showed some activity yet nothing could be seen with the burrow scope.

Common Eider

Eider numbers were very low this year averaging only 50-100 eiders at each morning count. Previous years Eiders had averaged between 150 and 300 for morning counts. Only 30 observations of eider crèches were documented (at least 4 separate crèches). Five eiders were banded by USGS and MDIFW.

Incidental Sightings

Species highlights: Northern Gannett, American Oystercatcher, Razorbill, Atlantic Puffin, Whimbrel.

Eastern Egg Rock

Rolanda Steenweg, Supervisor

Summary

Census numbers for nesting Roseate and Common Terns and Laughing Gulls increased on Egg Rock in 2011, with Arctic Tern nesting numbers decreasing. Like in 2010, this year's tern success seemed to depend mostly on food quality. In late-July, unfledged tern chicks began to lose weight and eventually starved to death, however, productivity remained close to the historic island average.

Census

Arctic and Roseate Tern nests were identified between 9 and 21 June, with Roseates increasing from 2010 levels from 82 to 90 nests and Arctic Terns decreasing from 83 to 77 nests. An island-wide Common Tern and Laughing Gull nest count was conducted from 17 to 19 June. Common terns increased from 2010, with a raw total of 711 nests that was corrected with a Lincoln index of 1.072, to 829 nests. Laughing gulls nesting increased from 2010's 1553 to 2051 nests, approaching the all time high from 2009 of 2127 nests. Twenty-five Common eider nests were identified opportunistically during the census.

Larid Productivity

Tern productivity was conducted using both fenced and unfenced plots. The 71 nests in the Common Tern plots hatched at a rate of 2.32 chicks per nest and fledged at a rate of 1.14 chicks/nest. Roseate Terns hatched 1.83 chicks/nest and fledged at a rate of 0.72 chicks/nest for the 75 nests followed. Similar to most seasons, Arctic terns were hit hardest by predatory gulls. The 27 study nests fledged only 0.40 chicks/nest of the 1.89 chicks hatched/nest. For the fourth season productivity was conducted on Laughing Gulls in a fenced plot which hatched 2.54 chicks/nest and fledged 1.5 chicks/nest. Predation events were somewhat rare in 2011, and weather was good and therefore did

not have a significant impact on fledging success; instead, the highest cause of mortality in all larid species appeared to be starvation.

Diet

Sixteen Common tern nests were observed for a total of 823 hours. Similar to 2010, hake was the most frequently-fed item, comprising 41% of feedings followed closely by butterfish at 32%, herring at 14% and Pollock at 4%. Six Arctic tern nests were observed for a total of 231 hours; hake was the most frequently fed item comprising 47% of diet followed by euphasids at 12%, butterfish at 11% and herring at 7%. Seven Roseate Tern nests were observed over 222 hours; again hake was the most frequently fed item at 53%, herring at 13% and pollock 4%. Roseates had the highest proportion of sand lance in diet comprising 12% of feeding.

Atlantic Puffins

This year there were 107 active puffin burrows on the island, not including large complexes. The fledging rate of 0.92 chicks/nest was about average for the island. Hake comprised the largest proportion of puffin diet at 70% followed by herring at 10% and butterfish at 5%. Hake was relatively small averaging 1.14 bill lengths.

Predation

Herring and Great Black-backed gulls were the predominant tern predators. Four Herring and three Great Black-backed gulls were shot over the course of the season. No nests were found on the island. As part of an effort to reduce Laughing gull numbers in the Gulf of Maine eggs in all Laughing Gull nests were poked during census and 109 adults were shot. Laughing Gulls appeared to be a source of predation on Common and Arctic tern eggs.

Other

Researchers successfully retrieved 8 of the 15 geolocators deployed on Arctic tern adults last year. This summer, Egg Rock welcomed 66 visitors, primarily donors and media personnel.

	2007	2008	2009	2010	2011
COTE					
census count	1206	1129	1036	714	829
Clutch	2.04	2.31	2.3	2.36	2.32
Hatch	1.75	1.95	1.97	2.08	1.85
Productivity	1.19	0.87	0.70	1.09	1.14

ROST

census count	118	129	101	82	90
Clutch	1.51	1.9	1.93	1.89	1.83
Hatch	1.15	1.5	1.34	1.72	1.33
Productivity	1.06	1.03	0.69	0.72	0.85

ARTE

census count	101	111	100	83	77
Clutch	2	1.79	1.8	1.83	1.89
Hatch	1.48	1.39	1.1	1.69	1.15
Productivity	0.97	0.71	0.37	0.64	0.40

LAGU

census count	1705	1972	2127	1553	2051
Clutch	--	2.57	2.26	2.30	2.54
Hatch	--	2.1	1.74	1.91	2.18
Productivity	--	1.2	0.74	0.87	1.5

ATPU

number of nests	90	101	107	71	106
Productivity	0.93	0.95	0.79	0.86	0.92

GULLS SHOT

GBBG	5	2	1	2	3
------	---	---	---	---	---

HERG	4	6	6	12	4
LAGU	0	93	89	156	109
GULL NESTS DESTROYED					
GBBG	0	0	0	0	0
HERG	2	5	1	1	0
LAGU	811	1982	2127	1553	2061

Pond Island NWR 2011

There were no resident staff on Pond Island this year so the Jenny Island crew tried to visit every 5-7 days to check productivity plots and monitor predation.

Census

The annual Gulf of Maine Seabird Working Group (GOMSWG) census was conducted on June 16. A total of 565 COTE nests were counted, with clutches ranging between 1 and 4 eggs. A Lincoln index mark/recapture correction of 1.037 was applied to the uncorrected count, which brought the total to 586 nests. 590 nests were counted in 2010.

Two Roseate Tern nests were found, compared with three last year. No Arctic Tern nests were encountered (three were present last year).

Productivity

For Common Terns, three productivity plots containing 16 nests were used to determine productivity, a summary of which follows:

Location	# of Nests	# of Eggs	# Hatch	# Fledge	# Fledge/ Nest
Productivity plots	16	33	16	11	0.69

The small number of nests in the productivity plots probably did not provide a sample size adequate to accurately represent the COTE productivity on Pond this year, so 0.69 is probably an inflated estimate. (Productivity last year was 2.08 chicks/nest.)

Two ROST nests were found; in one the egg was abandoned and the other the eggs disappeared and it is unclear whether the chicks hatched or survived. (ROST productivity last year was 0; all 3 nests were abandoned soon after the opening of the island.)

Mortality Events

The low COTE productivity this year can mainly be attributed to the presence of a Great Horned Owl. Several adults and a few chicks were found killed by GHOW, but nocturnal abandonment probably was the cause of the highest mortality of chicks. (During the check on July 19, we found 21 chicks that probably died of exposure.) We trapped for the owl on two nights (128 trap hours) but did not catch it.

Feeding Study

No formal feeding study stints were conducted this year. An informal stint and casual observations during each visit showed a large proportion of large hake, herring and butterfish, mostly 1.5-2.5 bill lengths. Sand lance was also present, but not nearly as much as last year, when it made up 39% of the diet. Herring was 10.9% of the diet last year.

Management Strategies

Last season when a GHOW began frequenting the colony it was trapped within four days and no further signs of owl predation were encountered. This year, as we had very little time on the island and only two nights of trapping, the owl was never caught and continued to harass the colony.

Predation by Herring and Great Black-Backed Gulls was persistent last year; we are uncertain about the level of predation this year. One GBBG nest was destroyed during census. No adults were removed.

Jenny Island 2011

Island Supervisor: Michelle Fournier

Census

The annual Gulf of Maine Seabird Working Group (GOMSWG) census was conducted on June 15. A total of 662 COTE nests were counted, with clutches ranging between 1 and 4 eggs. A Lincoln index mark/recapture correction of 1.0667 was applied to the uncorrected count. The addition of 47 productivity plot and feeding study nests brought the total to 753 nests. This number is higher than the past 10 years except for last year, when there were 854 nests.

Eight Roseate Tern nests were found, much lower than last year's count of 33 nests but higher than 2009's count of 3 nests.

A note about phenology: the first COTE hatch was June 14th last year; this year hatch did not begin until the 22nd. (June 18th last year vs June 21st this year for ROST first hatch.)

Productivity

For Common Terns, three productivity plots containing 26 nests and three feeding study plots with 21 nests were used to determine productivity, a summary of which follows:

Location	# of Nests	# of Eggs	# Hatch	# Fledge	Clutch Size (SD)	# Fledge/ Nest (SD)	Hatch Success ¹ (%)	Fledge Success ² (%)	Nest Success ³ (%)
Overall	46	116	109	88	2.52 (0.51)	1.91 (0.46)	94.0	80.7	75.9
<i>Productivity Plots</i>	25	64	62	50	2.56 (0.51)	2 (0.29)	96.9	80.6	78.1
<i>Feeding Studies</i>	21	52	47	38	2.48 (0.51)	1.81 (0.60)	90.4	80.9	73.1

For ROST, mean clutch size was 1.88, all eggs hatched (average hatch 1.88), and 1.42 fledglings were produced per nest (see Table 9), based on the ROST Recovery Team algorithm, which assumes that 95% of A chicks fledge and B chicks weighing more than 16.8g on day 2 fledge. It should be noted that actual productivity was probably higher than that estimated by the algorithm because two of the B chicks that were assumed to have died based on their below-16.8g day 2 mass were seen alive after they had reached 15 days of age.

Mortality Events

The level of Common Tern chick mortality in 2011 was similar to that of last year; 21 chicks were found dead in productivity nests (plots and feeding studies), compared with 23 in 2010. The vast majority of chicks that died were C chicks. The cause of death was not always clear, but as far as could be determined, exposure and starvation were the primary causes of mortality.

At least 12 COTE adults were found predated by Great Horned Owl prior to the opening of the island and on the day of opening. Traps were set the day of opening and one GHOW was caught and relocated to northwestern Maine.

Two COTE adults were killed by a juvenile Peregrine Falcon.

Feeding Study

Three feeding plots with 21 nests were monitored in 2011. A total of 1,146 feedings were observed during 1,144 chick-observation hours, producing an average feeding rate of 1.00 deliveries per hour (compared with 1.35 deliveries/hr in 2010). Average prey size was 53.6 mm. Hake (including white hake, *Urophycis tenuis*, and four-bearded rockling, *Enchelyopus cimbrius*) and Atlantic herring (*Clupea harengus*) each constituted about one-third of observed feedings (see Table 10). Butterfish (*Peprilus triacanthus*) was the next most common food item (about 18% of feedings), although many were too large to be swallowed by chicks. More than 94% of prey deliveries were fin fish.

Prey Species	Number of items	% of Diet (Frequency)¹	Average Size (bill length)²
Hake	386	33.7	1.50
Atlantic Herring	371	32.3	1.60
Butterfish	210	18.3	1.42
Unknown Fish	42	3.7	1.38
Pollock	39	3.4	1.92
Sand Lance	28	2.4	1.75
Amphipod	18	1.6	0.58
Unknown	18	1.6	0.63
Unknown Invertebrate	17	1.5	0.82
Insect	7	0.6	0.54
Stickleback	3	0.3	1.17
Rosefish	3	0.3	1.17
Euphausid	2	0.2	0.75
Moth	2	0.2	0.88

Management Strategies

COTE	1	94	510	971	732	937	828	837	1151	1067
ROST	0	0	8	36	6	7	0	0	15	0
ARTE	0	0	0	0	0	0	1	2	0	0

Productivity

COTE egg laying began almost a week later than in 2010, with the first eggs seen on 30 May 2010. Average clutch size (n = 65) was average at 2.43 eggs per nest. The first COTE hatched on 16 June 2011 with peak hatch occurring between 22 and 28 June 2011. Hatching success was 2.01 chicks per nest, as many C eggs failed to hatch. Productivity, however, was 1.60 chicks per pair: the second-highest ever on OGI. Good weather throughout the summer, with only two major thunderstorms and lots of warm sunny days, probably helped boost fledging success this year. With the exception of a few days in early July, food was generally good, and a large run of herring occurred just before peak fledging.

Yearly OGI Common Tern Reproductive Performance:

Year	2004	2005	2006	2007	2008	2009	2010	2011
Census Count	497	971	732	936	828	837	1151	1067
Avg. Clutch Size	2.26	2.22	2.35	2.48	2.32	2.87	2.81	2.43
Hatching Success	1.92	1.69	1.92	2.24	2.08	2.7	2.63	1.98
Fledging Success	1.45	0.67	1.13	1.71	0.61	1.68	2.09	1.60

Yearly OGI Roseate Tern Reproductive Performance:

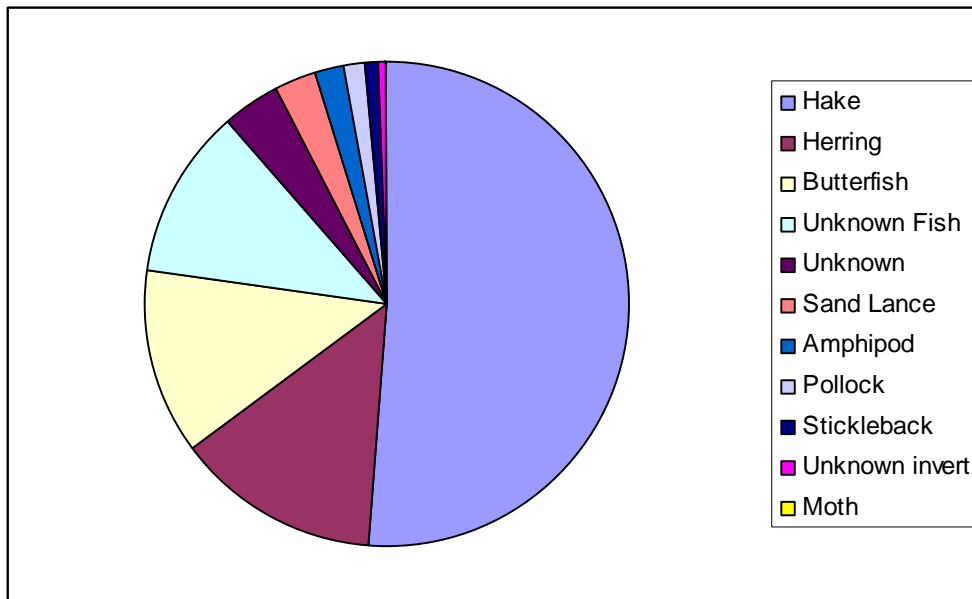
Year	2005	2006	2007	2008	2009	2010	2011
Census Count	36	6	7	0	0	15	0

Avg. Clutch Size	1.47	1.4	1.63			1.73	
Hatching Success	1.14	1.4	1.25			1.4	
Fledging Success	0.97	1.47	1.36			1.32	

Provisioning

Chick provisioning was recorded at 20 COTE nests on the island, with 1029 feedings observed over 1420 chick-hours of observation, for an average feeding rate of 0.55 per hour. Average prey size was 1.22 bill lengths, which was relatively small for the island, probably due to large numbers of amphipods and small hake fed to chicks midsummer. Hake (51%) was the most common fish provisioned to chicks, followed by herring (13.7%), butterfish (12.54%), and various other fish and invertebrates.

Prey Species' Percent of Diet on Outer Green Island in 2011:



Predation

Predation was a relatively minor problem on OGI this year. For the first time, no herring gulls (HERG) or great black-backed gulls (GBBG) attempted to nest on OGI. Two pairs of GBBG attempted to nest on neighboring Junk of Pork, and a total of 4 nests were destroyed, two of them probably re-nests. There

was little observed gull predation, although a number of eggs disappeared early in the season, and gull aggression increased dramatically near peak fledging. During this time, terns were seen driving gulls out of the colony. Four herring gulls were culled throughout the season, all of which were seen returning consistently to popular hunting vantage points in the intertidal zone.

Yearly Number of Gull Nests Destroyed on Outer Green and Junk of Pork Islands:

Number of Nests Destroyed (OGI & Junk of Pork)	2004	2005	2006	2007	2008	2009	2010	2011
Great Black-backed Gull	30	48	28	16	10	9	7	4
Herring Gull	3	33	8	9	5	2	0	0
Total	33	81	32	25	15	11	7	4

Weather

2010 was a mild, relatively dry season on OGI. The island received a total of 4.56 inches of precipitation between 18 May and 26 July 2011. Temperatures ranged between a low of 42 and a high of 87, with average temperatures of 55°F for May, 60°F for June and 68°F for July.

Other Species/Projects

The 2011 field season was the fifth year of monitoring Black Guillemot (BLGU) productivity on OGI. This year, 7 of the 13 known BLGU burrows were occupied and 7 burrows hatched eggs. The average clutch size was 1.86 eggs per burrow and the average hatch was 1.57 eggs per burrow. Of the 11 chicks that hatched, four disappeared and one was found dead, bringing the fledging success to 0.86 chicks per burrow for the season.

Stratton Island

Jason Tappa & Wayne MacCabe, Island Supervisors, National Audubon Society SRP

Census

Common, Arctic, Roseate, and Least tern nest counts were conducted in the tern breeding colonies. The colony was divided into twelve (Little Stratton – one section) sections using grid markers. Common Tern nests were counted by thoroughly searching each section on 6/17/11. Overall, 885

Common Tern nests were found. To correct for sampling error of missed nests due to high colony density or concealed nests, popsicle sticks were used to mark each nest in each section. One section of the colony was re-searched to obtain a ratio of marked to unmarked (missed) nests. After correcting for researcher error (Lincoln index = 1.04) and adding 40 nests from productivity plots and feeding studies the adjusted total was 960 Common Tern nests.

The 2011 adjusted GOMSWG census total of 960 Common Tern nests marks an 11% increase from 2010's total of 857 nests. Prior to the Common Tern census, 51 Roseate and 11 Arctic tern nests were flagged. Nest numbers of Roseate Terns increased from 2010's totals by 45% while Arctic Tern nests decreased from 12 to 11 active nests.

A colony-wide census was conducted in 2011 on June 16, and 59 active nests were found. The 59 active nests marks a decrease of 22% from the 76 active nests found in 2010. Using the high count of 22 fledglings, productivity is estimated at 0.37 chicks per pair.

Table 1: Number of tern nests found on Stratton Island from 2005-2011, by species.

Year	ARTE	COTE	LETE	ROST	Total
2005	3	156	19	2	180
2006	9	673	58	84	824
2007	9	752	113	79	953
2008	9	951	59	64	1083
2009	12	1037	72	76	1197
2010	12	854	76	35	977
2011	11	960	59	51	1080

Productivity

Common Tern productivity was estimated from 29 nests in 4 fenced productivity plots (A, B, C, and D) and 12 nests in unfenced provisioning study plots (Little Big and Watcho). All 41 nests within these plots were checked daily through the hatch, weather permitting. Chicks surviving 15 days were considered fledged, and any chicks found dead after 15 days were subtracted from the total number of fledged (successful) individuals.

Under normal conditions all Roseate Tern nests would be checked daily through the peak hatch, but due to inclement weather (rain and fog from 6/23-6/25; 1.23 inches of rain) researchers were unable to enter the colony at this time to collect data during this crucial time. Not all survivorship of "B" chicks could be calculated due to lack of data.

Table 2: Breeding parameters for Common, Arctic, and Roseate Terns on Stratton Island in 2011.

Species	Mean Clutch Size	Hatching Success	Fledging Success	# of Nests Monitored
COTE	2.42	83.8	89.4	40
ARTE	1.9	71.4	33.3	11

ROST	1.7	73.5		51
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*No ROST fledged success due to inclement weather.

Provisioning Studies

In 2011, 12 Common, 12 Roseate, and a subset of Least Tern nests were monitored in a chick provisioning (feeding) study. Feeding rates for Common and Roseate terns were 1.79 and 1.54 prey items delivered/hour. The main prey items Common Terns delivered to chicks was hake, herring, sand lance, and butterfish. The prey items Roseate Terns delivered to chicks was primarily sandlance, and hake. Least Terns also mainly delivered hake and sandlance to chicks. Table 3 provides primary diet summaries for each species.

Table 3: Principal prey items (percent) in tern chick diets on Stratton Island 2011.

Prey Item	COTE	ROST	LETE
Herring	20.1	6.05	16.91
Hake	39.1	12.48	48.04
Sand Lance	8.2	71.27	19.49
Butterfish	16.2	0.19	0
Stickleback	0.91	0	0

Overall, 547 Common Tern feedings were observed. Average prey size was 53.5mm (1 bill length = 36 mm). Common Tern chick diets primarily consisted of hake and herring comprising 39.1% and 20.1% of deliveries. Herring and hake was also the most abundant prey species observed in 2010 (herring 34%, hake 15%). Kleptoparasitism by Common Terns on Roseate, Arctic, and Least Terns was frequently observed.

Overall, 489 Roseate Tern feedings were observed. Average prey size was 51.26 mm (1 bill length = 39 mm). Sand lance was the primary prey item comprising 71.27% of diet, and hake was secondary at 12.48%. The abundance of sandlance and hake increased from 2010 feeding study observations (2010 – sandlance 53.6%, and hake 6.7%).

A feeding study was also conducted in the Least Tern colony from 27 June through 16 July. Stakes were placed around 22 nests in the colony and assigned to a single nest number, as chick mobility increases rapidly with growth. Overall, 816 feedings were recorded in 12 three hour feeding stints. With an average bill size of 26mm the average prey size was 33.08mm (1.27 bill lengths). Just like last year, hake was the primary prey item this season at 48% of deliveries. The average feeding rate per hour was 25.50. Using the high count of 22 fledglings, productivity is estimated at 0.37 chicks per pair.

Predator Control and Management

Methods used to control the gull populations on Stratton and Bluff Islands included nest destruction, egg-poking, dissuasion, audio harassment (using a Bird-Gard electronic playback system), and the lethal removal of adults.

Gull control efforts began in early May and ended in mid-August. Censusing was conducted in Zone 1 (Little Stratton) on May 20, May 26, and June 16. Zone 2 (south side of pond) was censused on May 26 and June 12. Zone 3 (Gull Meadow) was censused daily from May 5 –July 1; no new nests were discovered by late June. Zone 4 (Heronry) was not censused due to inclement weather. Zone 5 (Bluff Island) was censused on May 22 and June 10. Displacement walks were conducted daily throughout the season in Gull Meadow and the rocky perimeter from Heron Beach to Gull Meadow to dissuade gulls from loafing in these areas.

The 7 Herring Gull and 15 Greater Black Back Gull nest were destroyed on Stratton Island. On Bluff Island 101 Herring Gull nests with 266 eggs were poked, and 124 Great Black Back Gulls nests with 306 eggs were poked. Furthermore; 3 Herring Gull and 18 Great Black-backed Gull chicks were removed during visits to Bluff Island.

Common eider and tern chicks were regularly targeted by gulls. Heron fledglings near the “no landing sign” were also targeted. In 2011, 49 predatory gulls were removed by rifle.

Black-crowned Night Herons nest on Stratton Island within the heronry and have had negative impacts on all four nesting species of tern on Stratton Island. Boluses were recovered near nests in the heronry in which bands from all species of tern chick were present. In 2011 tern predation continued to occur and adults were captured on night vision cameras on more than one occasion within the Least Tern colony. In 2011 boluses containing all four tern species were again recovered. Researchers began conducting night stints (89 total person hours) in an attempt to remove predatory individuals. One Black-crowned Night Heron was removed on July 1 at 22:00 within the Least Tern colony, and another individual removed within the heronry returning to its nest on July 22 at 04:00. Although the stomach contents of the bird removed on July 1 contained no tern chicks; the individual removed on July 22 contained a Common Tern chick in its crop and also its stomach.

Common Eider

In 2011 staff censused Little Stratton (Zone 1, May 20, 26), Gull Meadow (Zone 3, May 5, 26), and Bluff Island (Zone 5, May 22). Common Eider nests in the Heronry (zone 4) were not censused due to inclement weather. A total of 51 nests were found (167 in 2010).

Wading Birds

Wading birds nest on the north side of the pond on Stratton Island. Early in the field season this area is divided into four zones, and censused prior to peak hatch. Researchers use mirror poles to view nest contents and egg templates to identify nests of each species. Each nest is then marked with a blue numbered tag. In 2011 the wading bird census was not carried out due to continued inclement weather early in the season.

Black Guillemot

Two active Black Guillemot burrows were confirmed in the Rocky area of Gull Meadow, and rocky area near the Benchmark. The nest near gull meadow was in the same location as the nest found in 2010. The Gull Meadow nest failed, but the Benchmark nest produced one chick. A high count of 18 adult Black Guillemots occurred in early August.

Double-crested Cormorant

On May 29, a visual estimate of 101 Double-crested Cormorant nests on Bluff Island was surveyed via boat. A thorough nest census was not conducted to prevent nest depredation by gulls. The 101 nests counted in 2011 is 1.04% lower than 2010's estimate of 106 nests.

American Oystercatcher

Two American Oystercatcher pairs nested on Little Stratton in 2011. Oystercatcher nests were checked randomly no more than twice weekly to reduce disturbance. One nest had a clutch of 3 eggs, hatched 3, and fledged 3 chicks. The second nest had a clutch of 2 eggs, hatched 2, and fledged 1 chick (possibly a second). A total of 4 adults and 4 fledglings were observed on August 8 from the Oystercatcher Blind during a shorebird survey.

Spring Passerine Migration

For 24 days between May 5 and June 7, five nets were open for 5 hours daily as time and conditions permitted. Overall, 405 birds of 4 species were captured during a total of 259.75 net hours; which calculated to a capture rate of 1.55 birds per hour. Of the 405 total captured birds, 209 were banded with a BBL metal band. Common Yellowthroats were the most abundant species, comprising 18% of total capture.

Other Notes

Stratton Island welcomed approximately 167 visitors including scheduled groups and random visitors.

Rare birds observed on the island included:

- Black Tern observed on June 8 and August 5
- Black-billed Cuckoo caught in a mist net on June 2
- Blue-headed Vireo caught in a mist net on May 22
- Bridled Tern observed on July 11
- Caspian Tern observed on July 13
- Chimney Swift observed on May 4
- Manx Shearwater observed on August 7
- Merlin observed on May 22
- Parasitic Jaeger observed on August 5
- Prairie Warbler observed on July 31

- Purple Sandpiper observed on May 21
- Seaside Sparrow caught in a mist net May 17-18
- Solitary Sandpiper observed on July 7 and July 20
- Tri-colored Heron observed on May 4 and June 15
- Whimbrel observed on July 30 and August 7
- Wilson's Warbler caught in a mist net on June 2
- Wood Duck observed on June 5

Western Casco Bay, Maine

*Survey by Bob Houston (USFWS) with Outer Green I National Audubon crew
June 9, 2011*

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

Survey by boat revealed no terns present. No terns seen in 2009 survey either.

The Nubbin, Yarmouth (55-223)

Survey by boat revealed no terns present. No terns seen in 2009 survey either.

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

Survey by boat, no terns seen. No terns seen in 2009 survey either. Active osprey nest on northeast ledge again this year.

Sister Island Ledge, Freeport (55-237)

Survey by boat – no terns seen. No terns seen in 2009 survey either.

Grassy Ledge, Harpswell (55-259)

Survey by land – no terns seen. No terns seen in 2009 survey either.

Black Rock, Harpswell (55-252)

Survey by boat - no terns seen. No terns seen in 2009 survey either.

Kennebec River to Damariscotta River

*Survey by Bob Houston USFWS and Outer Green I National Audubon crew
20 June 2011*

The following islands were surveyed by boat and no tern nesting activity was seen.

Pumpkin Island, Boothbay (65-287)

Outer Heron Island and ledges, Boothbay (65-279, 65-281, 65-282)

Inner and Outer White Islands, Boothbay (65-278, 65-276)

Thrumcap Island north and south, South Bristol, (65-266, 65-267)
Thread of Life Ledges, South Bristol (65-258, 65-257, 65-256)
Hypocrits, Boothbay (65-275, 65-272)
The Cuckolds, Southport (65-466)
Lower Mark Island, Southport (65-461)
Dry Ledge & Cat Ledges, Southport (65-453, 65-455, 65-454)
Sugarloaf Islands north and south, Phippsburg (73-213, 73-280)

Additional Species information:

Inner White Island (65-276)

45 DCCO nesting, nest count by boat (NCB); reasonably confident; 1120 hr.

Thread of Life Ledge (65-258)

90 DCCO nesting, nest count by boat (NCB); reasonably confident; 1140 hr.

Sugarloaf Island South (73-280)

150 DCCO nesting, nest count by boat (NCB); reasonably confident; 1355 hr.

Great Cormorants and Terns at some sites in Penobscot and Jericho Bays

Submitted by John Drury

Great Cormorants:

Summary - There were a total of 72 Great Cormorant nests counted at 5 sites, (in 2010 there were 65 counted at 4 sites). Again in 2011 as during at least the last 7 years Eagles attacked all the colonies. There were some fledglings seen dispersed from the colonies in early September. Observations suggest another year of very poor productivity and the weight of those fledglings is likely to be low, due to the repeated attacks of the eagles, decreasing the probability of those individuals surviving the winter.

Making some effort to increase the chances that this population persists would seem to be an appropriate priority for this group. Observers on Seal Island the first two weeks in May and the last two weeks in August and the first week in September dedicated to discouraging the presence of Eagles could do much to increase the chances of this one colony persisting. As there were eagles observed on the island several days during the summer, keeping Eagles off during the summer should be a priority in the work Plan for Seal Island.

Very few sub adult birds were seen in the area this summer, indicating that recruitment to this population continues to be very low.

The lack of commitment to try to protect this population suggests improvements could be made in the setting of priorities. The seabird populations in the region are dynamic to be relevant Gomswwg needs to be dynamic too. As the Eagles reduce the number of Gull colonies the opportunities for tern colonies at these former gull islands may increase reducing the need for manning tern islands this could free up resources for other projects.

Little Roberts

June 15, 14 GC nests . @65 DC nests

July 10, @1/2 of the DC nests abandoned

Aug. 4, 4 eagles on the island

Aug 5, all Cormorant nests abandoned GC and DC chicks have moved to the shoreline

Aug 18 15 eagles counted on adjacent Otter Island

Aug. 24, 18 GC chicks, 1 eagle on Little Roberts, 2 eagles on Roberts. This year's fledgling GC at Yellow rock, @1/2m from Little Roberts.

Sept 4, 1 imm. GC. 4 imm. GC. on Yellow Rock. A Great Cormorant chick on the island after a month of attacks by eagles indicates their reluctance to disperse from the colony.

Seal Island

June 5, 16 GC nests, an eagle was roosting above them, he flushed off as we approached, this caused the Great Cormorant to flush off their nests. 2 GC nests in SW cove,

June 16 eagle on Western head.

June 21, 19 GC nests

June 27 adult eagle western head

Aug 23, 2 Adult Eagle on the western head, most Cormorant moved to the shore, the DC are Gone.

Aug. 31. 2 eagles on SW head above the GC all of them have moved to the shoreline, 9 GC chicks SW cove, 6 GC chicks west side of the western head. I saw no others away from the colony.

The Black Horse

June 4, 29 Great Cormorant nests, 20 Double-crested Cormorant nests, 5 eagles flush off. 8 great Cormorant nests west side, east side, 21 Great Cormorant nests, 50 adult GC., 7 displaying.

July 1, 19 Great Cormorant nests from the west, 53 adult GC.

23 DC nests on the ridge, from the east 21 new DC and 4 new GC nests, total, 23 GC nests, though many have shifted sites to the steeper NW side.

July 31, 5 eagles, 7 still active GC nests on the west side some with chicks.

Total @15 GC chicks.

Sept 1, 0 cormorant, White Horse, 4 imm. Gc. This years, doubtless from the Black Horse

White Horse

June 4, 1 Great Cormorant nest.

July 1, nest abandoned

Sept 1, 4 this years fledgling GC, From the Black Horse

Brimstone Ledge (Burnt coat Harbor)

June 4, 9 Great Cormorant nests, 23 adult GC. one imm.

July 1, (Burnt Coat Harbor), immature eagle over the ledge, 14 GC. adult, 3 new nests, displaying adult in the new group. 9 GC nests, 18 adult GC, 2 DC nests.

Sept. 1, 2 adult GC no fledglings seen in the area

There were no Great Cormorant nests on Great Spoon, Little Spoon, Southern mark Is. or John's Is. I did not get to Metinic Green.

Terns:

Is an annual complete survey of all the tern colonies necessary? Trends could be indicated by nest counts every other year at the larger colonies.

Eastern Cowpen

June 4, 130 Common tern.

July 1, estimate @50 common tern nests

Great Spoon

June 4, 2 common terns on Spit, gulls very sparse on the island denser on the spit.

July 1, 2 pair common tern on the spit. Guess 2 nests.

Dry Money Ledge

July 1, estimate @50 common Tern nests.

Three Bush Island

June 4, 0 terns, 2 laughing gulls

July 1, 40 Common Terns, estimate @30 nests

Sept 1, 60 Common terns, 4 fledglings seen. Long after the large colony at Seal Island has been gone.

Woodenball Island

July 7, estimate @15 pairs of Arctic Terns,

July 24, @ 30 Arctic terns present, indicating that some success was achieved, no fledglings seen.

I did not visit, Large Green, Little Green, or Metinic Hog Island.

New Hampshire Islands

Seavey and White Islands

Project coordinators Dan and Melissa Hayward

Census

On June 17th, 2011, staff biologists and volunteers from Shoals Marine Lab (SML) conducted the Common Tern census on White and Seavey Islands. Common Tern (COTE) numbers were up this year to 2447 pairs from 2251 pairs in 2010. Roseate (ROST) and Arctic Tern (ARTE) nests were all marked and confirmed visually on or before June 20, 2011. ROST pairs decreased from 48 pairs in 2010 to 42 pairs in 2011. ARTE numbers decreased from 6 pairs in 2010 to 3 pairs in 2011. On White Island there was a small increase in the number of COTE nests from 82 in 2010 to 90 in 2011. The presence of a dog on White throughout the breeding season discouraged the terns from nesting in the area around the house. An electric dog fence was set up upon arrival and the dog was encouraged to roam within the boundaries. There were a few nest scrapes within the fence but no nests were established. One pair of ROST and 2 pair of ARTE nested on White Island in 2011. On July 13, a B-Wave census was “conducted” on White and Seavey Islands. An estimate of 321 new nests on Seavey, based on new nests in productivity plots, and a ground count of 43 nests on White made for a B-Wave total of 364 nests. Eight ROST nests and two ARTE nests were initiated after the census period.

Census (6/12-6/20)

Species	COTE	ROST	ARTE
Date	6/17/2011	6/20/2011	6/20/2011
A-Wave (ground count)=	2116	42	3
Corrected with Lincoln’s Index(321m,9um)=	2175		
+ Plots(182)+White Is(90)=Total	2447	After 6/20/11	After 6/20/11
B-Wave (July 13)	364	8	2
Season Total Nests	2811	50	5

Five Year Population Comparison (at Census)

Species/Year	2006	2007	2008	2009	2010	2011
COTE (prs)	1736	2121	2011	1993	2251	2447
ROST	33	52	37	34	48	42
ARTE	6	5	6	6	6	3

Five Year Population Comparison (Season Totals)

Species/Year	2006	2007	2008	2009	2010	2011
COTE (prs)	2463	2539	2227	2377	2615	2811
ROST	38	57	40	40	53	50
ARTE	8	6	8	7	6	5

Tern Productivity (A-Wave)

COTE productivity decreased from 1.81 in 2010 to 1.36 in 2011. The clutch size decreased from 2.68 eggs per nest in 2010 to 2.29 in 2011. ROST productivity decreased in 2011 to 1.21 chicks per nest compared to 1.31 in 2010. ARTE productivity decreased in 2011 to 0.33 from 1.50 chicks per nest in 2010.

The weather was fairly mild throughout the season with no significant weather related incidents. There were a few rain events in which we had a small number of chicks die but there were no large scale mortality events. The vegetation on Seavey grew quickly early on but then stalled throughout the majority of the breeding cycle. As the fledging period approached more rain sparked a burst in growth but the chicks were very mobile and were not seriously affected by it. We will need to look at opening up more habitat later in the fall or in the spring.

At census, the COTE numbers were up 8.7% and the nest density in the plots increased by 17.1%, over 2010. At the end of the season, the overall population was up 7.5% and the nest density in the plots increased by 12.2%. There was a COTE B-Wave of approximately 364 nests and the productivity was 0.27 chicks per nest. The adults in the nests that we were able to follow became less and less attentive towards the eggs and chicks once the majority of the colony started leaving for the day. There were a number of fledged COTE's that were found dead late in the season that had been abandoned by their parents. Of the 8 ROST nests initiated after the census period only 4 chicks fledged.

Gull predation, on COTE eggs, was sporadic in late May and early June. There was constant pressure but it was not enough to cause any abandonment. During the fledging period there was a marked increase in predation. There was one GBBG in particular that keyed in on the tern chicks, presumably as a food source for its chick(s). It was seen entering the colony multiple times throughout the day, eating chicks and then flying off towards Star Island. If it landed it would not land on White, Seavey or any of the ledges around the island, for more than a minute, or two, before flying to the other island. We were unable to take this bird.

The following table represents the Peak COTE hatch information for the A-Wave.

Year	2007	2008	2009	2010	2011
Peak Hatch Period	6/22-6/26	6/23-6/27	6/26-6/29	6/19-6/23	6/23-6/28
Peak Day	6/23	6/23	6/29	6/20	6/25
Standard Deviation	3.53	3.95	3.64	4.10	3.25

Tern Productivity

COTE A-Wave Totals [Season Totals]

Year	2006	2007	2008	2009	2010	2011
Nests Monitored	114 [163]	119 [145]	128 [143]	122[140]	184[189]	184[212]
Mean Clutch Size	2.38 [2.17]	2.27 [2.19]	2.35[2.29]	2.53[2.45]	2.68[2.62]	2.29[2.22]
Mean Hatch	1.87 [1.48]	2.13 [2.02]	2.08[1.95]	2.15[2.00]	2.37[2.26]	2.05[1.91]
Fledglings/Nest	0.60 [0.47]	1.22 [1.21]	1.28[1.21]	1.23[1.11]	1.81[1.67]	1.36[1.22]
Total Fledglings	1041 [1158]	2588 [3047]	2614[2695]	2541[2638]	4074[4393]	3328[3429]
Total Individuals	4513 [6084]	6830 [8125]	6636[7149]	6437[7392]	8576[9623]	8222[9051]

ROST A-Wave Totals [Season Totals]

Year	2006	2007	2008	2009	2010	2011
Nests Monitored	33 [38]	52 [57]	37[40]	34[40]	48[53]	42[50]
Mean Clutch Size	1.48 [1.42]	1.62 [1.56]	1.78[1.75]	1.88[1.75]	1.90[1.87]	1.98[1.86]
Mean Hatch	1.24 [1.11]	1.42 [1.37]	1.46[1.35]	1.26[1.10]	1.44[1.38]	1.38[1.22]
Fledglings/Nest	0.97 [0.87]	1.25 [1.21]	1.24[1.18]	1.06[.93]	1.31[1.27]	1.21[1.16]
Total Fledglings	32 [33]	65 [69]	46[47]	36[37]	64[66]	51[58]

ARTE A-Wave Totals [Season Totals]

Year	2006	2007	2008	2009	2010	2011
Nests Monitored	6 [8]	5 [6]	6[8]	6[7]	6	3[5]
Mean Clutch Size	1.67 [1.75]	2 [2]	1.83[1.88]	2.00[2.00]	2	2.0[2.0]
Mean Hatch	0.67 [1.0]	1.20 [1.17]	1.33[1.25]	0.43[0.71]	1.83	1.0[0.60]
Fledglings/Nest	0.5 [0.75]	0.60 [0.50]	0.67[0.63]	.33[0.29]	1.5	0.33[0.20]
Total Fledglings	5	3 [5]	3 [3]	2[2]	9	1[1]

Tern Feeding Study

Structured feeding study was conducted during the period of 6/23/11-7/19/11

COTE

# Of Nests	Nest Hours	Feeding Rate
68	422	1.06

Species	Hake	Butterfish	Unk.Fish	Herring	Sand Lance
% of Diet	30.03	23.66	16.74	15.63	5.13

Predator Control: **Biologists arrived on island on May 20 and no evidence of gull nesting was documented throughout the season. Pyrotechnics and regular sweeps of the island continued from May 20 through the end of the field season. As a result of predation and non-response to all other control methods, 5 GBBG and 2 HERG were taken. There were instances of depredation throughout the breeding season. One adult COTE was seen taken by an adult GBBG.**

Predator Control (as of 8/17/2011)

Species	Nests Destroyed	Eggs Destroyed	Adults Taken
GBBG	0	0	5(+3 relief kills)
HERG	0	0	2(+1 relief kills)

Gull Control (May 20-Aug 17)

Control Method	Avg/Day
Human Control	1.50
Screamer	1.17
Banger	0.39
Problem Gull	0.08
Relief Kill	0.05

Other Nesting Species

Species	COEI	SPSA	SOSP
# Of Nests	~30	~10	~6

Other Tern Sightings, Rare Birds, and Interesting Observations

- ATPU were seen regularly through late June. Max seen at one time was 5.
- ROST that was banded as a chick on Rockabill Island, Ireland in 2009 observed on 7/23 and 7/28.
- Other tern species seen-BLTE, CATE.
- COMU-6/26; RAZO-6/6, 6/22, 7/13

Funding for this project comes from the USFWS State Wildlife Grants, New Hampshire Fish and Game Nongame and Endangered Wildlife Program, NH Moose Conservation License Plate Program, the 908 Group, and private donors.

Massachusetts Islands

MONOMOY ISLANDS – Monomoy NWR

Michelle Avis – Biological Science Technician, U.S. Fish & Wildlife Service

Kate Iaquinto – Wildlife Biologist, U.S. Fish & Wildlife Service

North Monomoy Island

Common Tern:

Census

The North Monomoy tern census was conducted on 18 June 2011. Observers documented 8 Common Tern nests in the historic nesting area on the northwest portion of the island. This is a slight increase from 2010, where three nests were documented. However, these numbers display a dramatic decline from 2009 when 272 nests were documented.

Productivity

Productivity was not quantitatively measured, but was estimated to be negative, with no evidence of nests hatching successfully. Poor productivity has been attributed to habitat loss due to overwash and a high concentration of predators, including Great Black-backed Gulls, Herring Gulls, and Black-crowned Night-Herons, which all nest on the island.

South Monomoy

Common Tern:

Census

The South Monomoy tern and gull census was conducted on 15-16 June 2011. The nesting area has been delineated into 60m² grids, and all nests were tallied by grid number. The total number of Common Tern nests counted was 6,741. With the Lincoln Index adjustment, this number is increased to 6,904 nests for South Monomoy.

A second census was not conducted, but an additional 115 nests (23.5% of the total 489 enclosed nests) were initiated in productivity enclosures after the census window, indicating an additional 2,123 nests in the colony after 20 June.

Productivity:

The reproductive success of Common Terns on South Monomoy was excellent based on 373 A-count nests in 30 fenced productivity enclosures located throughout the colony. An increase in suitable nesting habitat as well as a notable decrease in predator presence may have contributed high productivity. The following calculations are based on A-nests only and reproductive success is measured by nest attempts.

Table 1. Comparison of Productivity Information for A-Period Nesting Common Terns on South Monomoy Island: 2009 to 2011

	2011	Standard Deviation	Standard Error	Sample Size	<i>2009</i>	<i>2010</i>
Average Clutch Size	2.49	0.64	+/- 0.03	374	<i>2.17 eggs/nest</i>	<i>2.62 eggs/nest</i>
Average Eggs Hatched Per Nest	1.99	1.05	+/- 0.05	374	<i>0.62 eggs hatched/nest</i>	<i>2.30 eggs hatched/nest</i>
Hatching Success	80%				<i>29%</i>	<i>88%</i>
Fledging Success	64.7%				<i>57%</i>	<i>54%</i>
Reproductive Success	1.29	0.55	+/- 0.03	374	<i>0.35 chicks/nest</i>	<i>1.25 chicks/nest</i>

Table 2. Number of Pairs and Reproductive Success of Common Terns on South Monomoy Island 2007-2011

	2007	2008	2009	2010	2011
Number of Pairs	7948	6834	2347	6450	6904
Reproductive Success	0.70	1.12	0.35	1.25	1.29

Feeding Stints

Common Tern feeding stints were not conducted on a regular basis for the 2011 field season due to an inadequate number of staff and lack of available time. Anecdotal evidence suggests that the most

common prey items were likely sand lance with other observations of mackerel, herring, butterfish, bluefish, and one moth.

Adult Trapping and Banding

Fifty-one banded adult Common Terns were recaptured this season using Potter traps. Thirty-six of the recaptured adults were originally banded at Monomoy NWR. The remaining recaptured band numbers have been reported to the Bird Banding Lab to obtain information about the origin of their bands. A total of 31 other adult Common Terns were banded opportunistically during trapping efforts.

Salmonellosis

Presence of the Salmonella bacteria was estimated to be very low in the tern colony this year. Only one Common Tern fledgling was suspected to have died of salmonella, and the animal was sent to the National Wildlife Health Center in Madison, WI for testing. Test results are still pending.

Roseate Tern:

Census

A total of seven Roseate Tern nests were counted during the 15-16 June census of South Monomoy. A Roseate Tern B-Census was conducted on 10 July, and only four pairs remained active: two newly hatch chicks had died and one nest had been abandoned.

Productivity

The reproductive success of Roseate Terns on South Monomoy was poor based on the fledging success of seven nests within the main tern colony. The following calculations are based on the total number of A-nests and reproductive success is measured by nest attempts. No calculations are included for 2008 and 2009, as Roseate Terns did not nest on South Monomoy these years.

Table 3. Comparison of Productivity Information for A-Period Nesting Roseate Terns on South Monomoy Island: 2011

	2011	Standard Deviation	Standard Error	Sample Size	2010
Average Clutch Size	1.14	0.38	+/- 0.43	7	1.50 eggs/nest
Average Eggs Hatched Per Nest	0.57	0.53	+/- 0.20	7	1.25 eggs hatched/nest
Hatching Success	50%				83%

Fledging Success	50%				90%
Reproductive Success	0.29	0.49	+/- 0.18	7	1.13 chicks/nest

Table 4. Number of Pairs and Reproductive Success of Roseate Terns on South Monomoy Island 2006-2010

	2007	2008	2009	2010	2011
Number of Pairs	2	0	0	8	7
Productivity (chicks fledged/nest)	1.00	0	0	1.13	0.29

2011 Attraction Project

A Roseate Tern Attraction Project was initiated during 2009 in an effort to attract Roseate Terns to South Monomoy due to the severe loss of habitat on Minimoy Island. This project was continued for 2011; however, when it was discovered that several pairs of Roseate Terns were located in different areas of the colony, the sound system was disabled. It was determined to be unnecessary to play the recording since live pairs were present throughout the colony and the recording only played calls from a few birds.

Adult Trapping and Banding

In addition to the three chicks banded on South Monomoy, four Roseate Tern adults were newly captured using Potter traps and banded with service and metal field readable bands. One color-banded adult Roseate Tern was recaptured, and the bands were reported to the BBL and Jeff Spendelow, USGS Roseate Tern Biologist.

Roseate Staging and Re-sighting

In conjunction with Mass Audubon and USGS, Refuge staff has been conducting counts of staging Roseate and Common Terns on the Refuge and South Beach, Chatham, in addition to resighting colorbanded adult Roseate Terns. Staging counts began on 25 July and will continue through mid-late September.

Least Tern:

Census

A walk through A-period census was conducted at the first nesting area on 19 June where a high count of 40 adults was documented and 10 nests were found. A walk through census was not completed at other nesting areas; however, on 19 June a high count of 70 individuals was documented at the second

area and on 20 June a high count of 20 individuals was documented at the third nesting area. The total number of nesting pairs was estimated to be 104.

Productivity

Productivity was not quantitatively monitored, but was estimated to be negative as only one chick was documented to have hatched from a nest and zero chicks were documented to have fledged. Productivity was qualitatively estimated to be fair in 2010 and poor in 2008 and 2009.

Laughing Gull:

Census

On June 15-16, 395 active Laughing Gull nests were counted within the tern colony, compared to 355 in 2010, 547 in 2009, and 1,317 in 2008.

Productivity

Productivity was not monitored, but it was estimated to be qualitatively good based on the number of chicks and fledglings seen throughout the nesting season. No Laughing Gull nests were destroyed during the 2011 field season.

Kleptoparasitism

Stints were continued this year to monitor the number of kleptoparasitism attempts by Laughing Gulls on Common Terns. A total of 34 one-hour long stints and an additional two stints under one-hour long were conducted in the tern colony on South Monomoy. Observers recorded a total of 497 kleptoparasitism attempts over approximately 35.75 hours for an average of 13.9 attempts per hour. Laughing Gulls were successful in 35.21% of the attempts, Common Terns were successful 29.78% of the time, the outcome was unknown 27.16% of the time, and prey items were dropped in 7.85% of the attempts.

Minimoy Island

Common Tern:

Census

On 16 June, 342 Common Tern nests were counted. No Lincoln Index was conducted to minimize disturbance. This number is up from 194 pairs in 2010; however, this number continues to be a large decrease from 1,453 nests in 2009. While more suitable nesting habitat was observed on Minimoy for 2011, the overall habitat has decreased since 2008 and 2009.

Productivity

Productivity was not monitored, but was estimated to be qualitatively poor. Loss of nests from overwash and some predation by gulls impacted Common Terns throughout the season.

Roseate Tern:

Census

Three Roseate Tern nests were present during the 16 June census, which is an increase from 2010 (one pair) and 2009 (zero pairs). During 2008, a total of 30 Roseate Tern nests were counted during the A-census window. Minimoy Island has been subject to numerous habitat changes and severe overwash in recent years, attributing to the decline of nesting Roseate Terns on the island.

Productivity

Roseate Tern chicks were monitored up to 15 days of age. Five chicks fledged from nests located on Minimoy Island. A total of six chicks were banded; however, one chick was not found after 15 days and was documented as unfledged. Productivity was calculated to be 1.67 chicks/pair based on A-nests at Minimoy.

Black Skimmer:

Census

On 16 June, five Black Skimmer nests were counted. Five nests were also counted in 2010, 2009, and 2008.

Productivity

Productivity estimates were determined based on five A-count nests. A total of seven chicks hatched from five nests, and a total of five chicks were banded. Only one fledged chick was documented, assuming a productivity estimate of 0.2 chicks/pair for BLSK at Minimoy. For 2010, productivity was estimated to be 0.4 chicks/pair; however, in 2008 and 2009, reproductive success was negative.

Laughing Gull:

No laughing gull nesting activity occurred on Minimoy this year.

Predators (Refuge-wide)

Great Black-backed Gull and Herring Gull:

Two Great Black-backed Gull nests were removed from South Monomoy in 2011 due to their proximity to nesting Piping Plovers or American Oystercatchers. A total of 51 Great black-backed Gull and Herring Gull observations were made within the tern colony during 2011. During the 15-16 June census of the South Monomoy tern colony, 98 eggs were documented as depredated by gull. Gulls were suspected to be the primary predator of tern eggs at South Monomoy.

Northern Harrier:

Nesting Northern Harriers were not documented on the refuge, but based on their presence on South Monomoy, in addition to the abundance of suitable Northern Harrier habitat, it is likely that at least one pair was actively nesting. Northern Harriers were observed at the South Monomoy tern colony 10 times throughout the season.

Coyote:

A total of 13 coyotes were removed from South Monomoy in 2011. Evidence of coyote (scat and tracks) was found in and around the tern colony throughout the season. There was evidence of coyote depredation on tern eggs, as well as eggs of other nesting birds including Piping Plovers and American Oystercatchers.

Black-crowned Night-Heron:

A wading bird census was not completed in 2011 due to poor weather and numbers of nesting waders is unknown; however, minimal predation from Black-crowned Night-Heron was observed within the tern colony. During the 15-16 June census of the South Monomoy tern colony, five eggs were documented as depredated by Black-crowned Night-Herons. Black-crowned Night-Herons were only observed two times at the South Monomoy colony in 2011.

Owl (Unidentified Species):

No definitive evidence of owl presence was documented within the colony.

Peregrine Falcon:

No evidence of Peregrine Falcon predation was documented within the colony on South Monomoy. Peregrine Falcon predation on gulls was apparent at North Monomoy but was not closely monitored.

Massachusetts Tern Census Numbers, 2011

Dr. Ian Nisbet

These numbers were compiled at the Massachusetts tern and plover meeting, held on 4 August. They are preliminary and are subject to minor changes when full reports are submitted. They were compiled by Ian Nisbet, on behalf of Carolyn Mostello (MA NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM)

	ROST	COTE	ARTE	LETE	BLSK	LAGU
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TOTAL pairs in MA 2011	1,359	16,734	0	4,054	5	1,581
% CHANGE from 2011	-2	+3	-100	+21	0	+27
MASS GOM (includes Monomoy NWR)	12	10,147	0	2,438	5	1,581
% CHANGE from 2011	+500	+8	-100	+29	0	+27

Notes on total pairs:

ROST: Little change in total numbers since 2008: may have stabilized following 35% decline 2000-2008.

COTE: Highest total ever, but only by a small margin. Numbers have been stable at about 16,000 since 2003, following steady increase from low of <4,000 pairs about 1976.

ARTE: Finally extirpated as breeder in Massachusetts following steady decline from >300 pairs in the mid-1950s. One unpaired individual at Plymouth Beach in 2011. Some of the hybrid young raised at Penikese Island since 2007 are expected to return to breed.

LETE: Highest total ever, resuming a somewhat irregular increase since the 1970s which was broken by markedly lower numbers in 2003-2008. As usual, there were many rearrangements and many birds changed sites in mid-season after early failures.

BLSK: Stable.

LAGU: Increased following a dip in 2010, but not back to 2008 high of 1,816 pairs.

Buzzards Bay Tern Census Numbers, 2011

	COTE	ROST	ARTE
BIRD ISLAND	1,872	937	0
% CHANGE from 2010	-4	+27	—
RAM ISLAND	3,345	377	0
% CHANGE from 2010	-3	-35	—
PENIKESE ISLAND	1,206	34	0

% CHANGE from 2010	+13	-8	-100
BUZZARDS BAY total	6,423	1,348	0
% CHANGE from 2010	-1	0	-100

Buzzards Bay is outside the GOM, but is traditionally reported on at GOMSWG meetings because it is the site of intensive management and monitoring programs by MNHESP, and is the core breeding area for Roseate Terns, from which some birds emigrate to the GOM (and to which a few birds return from the GOM).

Arctic Terns were finally extirpated after having nested at Penikese since 2002. Common and Roseate Terns were essentially stable except for movement of about 350 pairs of Roseates from Ram Island to Bird Island, despite the habitat restoration program at Ram, which was started in 2010 and completed in 2011. Common Terns are down from a transitory peak in 2009; Roseates have been stable since 2008 following a major decline 2000-08.

Complete data on productivity are not yet available, but productivity appears to have been >1 chick raised to fledging per pair for both species at Ram and Bird Islands, but lower at Penikese because of predation and lack of resident wardens in 2011 because of funding problems.

Afternoon Session Abstracts

Update of seabird recovery efforts in the Gulf of Maine

Linda Welch

Censusing Puffins in Rock Habitat – A New Model from Seal Island National Wildlife Refuge

S. Gutowsky

Atlantic Puffins (*Fratercula arctica*) were extirpated from Seal Island by the late 1880s from human exploitation of eggs and adults. Through the management efforts of the National Audubon Society, breeding puffin numbers have since increased from zero in 1984 when chick translocation efforts began to over 500 in 2011. Due to the colony's successful growth, it has become impractical to conduct a complete survey of every active burrow on the island each breeding season, as has been done since

the first breeding pairs arrived in 1992 . In 2011, a new reduced census method was developed using permanent circular plots of 3 m diameter spaced evenly throughout the main breeding colony. Each plot is thoroughly investigated throughout the season to determine the activity status of each known burrow and the presence of any new burrows. A variety of methods are used in combination to determine burrow activity: feeding observations from blinds, direct observation of eggs, chicks or incubating adults within burrows, and indirect evidence of burrow occupation including hearing adults and chicks, or observing discarded fish piles and chick toilets. Furthermore, a new method was initiated in 2011 whereby remote motion sensor cameras were set on burrows that were otherwise indeterminable due burrow location, shape or depth; this new method proved very useful in capturing images of feedings that would otherwise have been missed. A colony-wide extrapolation of burrow activity within the plots is currently under development, and is expected to provide a useful index of colony growth.

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To Be a City Gull or Not - Comparing Herring Gull breeding success in urban and natural nest sites

Jason Lariviere

Herring Gulls (*Larus argentatus*) naturally nest on islands off the coast of Maine. As found in other regions like the Great Lakes, gulls also choose to nest on certain rooftops and ledges on large buildings in Portland, ME. This study sought to understand if there is a cost or benefit to nesting in urban areas by comparing reproductive success on Wood Island, Biddeford, and a colony on 100 Middle Street, Portland. Egg size, clutch size, and hatching success was measured at both sites. Chick growth measures were recorded at the urban site, but not the natural site. There was no significant difference in egg size, clutch size or hatching success. The buildings allow a safe nesting site in which the ledges provide protection from predators. All the nests were located against the ledges, rather than in the open. Along with this, food is easily available for one parent to fetch while the other protects the young, using the height of the building to scope out dangers, and the walls as a sort of shield. On the island everything is much more competitive, and the chicks are constantly under watch from other gull predators. To put it simply, the gulls choose the buildings because it is a great place to raise their young.

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Use of high resolution cameras for documenting Atlantic Puffin diets

Nathan Banfield

Mounting and recovery methods for geolocators on Atlantic Puffin

Caroline Poli

Satellite tracking of greater shearwater in the Gulf of Maine

Linda Welch

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