

# Outer Green Island Casco Bay, Maine

2006 REPORT to the CASCO BAY ESTUARY PARTNERSHIP  
for habitat restoration conducted under a grant from the  
Casco Bay Habitat Restoration Fund

## 2006 Season Report May 5–July 27

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## Introduction

### General Introduction

The fifth Outer Green Island field season started on 8 May. Audubon wardens resided on the island from 5 May to 27 July. The National Audubon Society's Seabird Restoration Program and the Maine Department of Inland Fisheries and Wildlife cooperatively manage the Outer Green Island tern restoration program. Outer Green is located 5 miles east of Portland, Maine and approximately 2.5 miles from the nearest islands (Jewel and Peaks). The island is elevated and has a total acreage of 5.45 acres of upland habitat (above mean high tide). The island primarily consists of vegetated terrain. Cow parsnip, stinging nettle, and several grasses cover the interior of the island along with many other herbaceous and woody perennials. The geological make-up of the island is primarily metamorphic schist.

### Tern History

In the late 19<sup>th</sup> century, nine outer islands in Casco Bay were believed to have supported significant Common (*Sterna hirundo*), Arctic (*S. paradisaea*), and Roseate (*S. dougallii*) Tern colonies. During this same time period, the millinery trade began to slaughter seabirds, particularly Herring Gulls (*Larus argentatus*) and terns, for the acquisition of their feathers. This practice devastated seabird populations. Laws protecting the terns, such as the Lacy Act (1900) and the Migratory Bird Treaty Act of 1918 were too late to repair the damage. Following the millinery trade, and a brief rebound through the early 1930's, tern populations again decreased, but this time due to pressure from predation and nest site competition with Herring and Great Black-backed Gulls (*L. marinus*). By 1990, only 124 pair of Common Terns remained on three islands in Casco Bay, and no Roseate or Arctic Terns were present.

Casco Bay has been an important area for tern restoration in Maine since 1991. The Jenny Island restoration program was initiated in 1991. By 1992, Jenny Island hosted the largest Common Tern and the only nesting site for the federally endangered Roseate Terns in Casco Bay. This colony peaked with 1,167 pairs in 1998. But in recent years, predators have devastated the colony. Avian and mammalian predators including mink (*Mustela vison*), Great-horned Owls (*Bubo virginianus*) and Black-crowned Night-Herons (*Nycticorax nycticorax*) have been observed on Jenny Island. The colony decreased from 1,167 pairs of terns in 1998 to a low of 59 pairs in 2001; 684 pairs of terns nested in 2006.

Outer Green Island was chosen as a new restoration site during the 2001/2002 winter largely because of its nesting history and location. Terns last nested in the island in 1914. The 2-mile buffer from the nearest large forested islands should be great enough to deter most predators, including mink and Great-horned owls. Great Horned Owls (GHOW) have been reported as nesting on Jewel Island but there was no evidence of predation by GHOW on gulls when the researchers established camp on the island.

### Significant Dates

- 5 May – Staff arrive, OGI officially open for season
- 6 May – First Common Terns observed around the island
- 6 May – First day of mist netting
- 6 May – Leach’s Storm Petrel sound system set up
- 17 May – First Roseate Terns observed around the island
- 31 May – First Roseate and Common Tern eggs found
- 19 June – GOMSWG census completed
- 19 June – First COTE chicks found on the island
- 24 June – First ROST chick found on the island
- 2 July – First BLGU chicks found
- 6 July – Peregrine Falcon seen taking an adult COTE
- 14 July – First COTE fledger seen flying
- 15 July – Peregrine Falcon last seen on the island
- 17 July – First ROST fledger seen flying
- 27 July – Researchers leave the island

### Weather

Weather data collection began on 7 May and concluded 25 July. Sea surface temperature, ambient temperature, wind speed, wind direction, cloud cover, and visibility were recorded throughout the field season. All variables except sea surface temperature were collected at 0600, 1200, and 1800 hours. Sea surface temperature was recorded at 0600 and 1200 hours at the landing site located on the southwest side of the island. Temperature was recorded using an outdoor thermometer. Wind speed was recorded using the Portland Weather Buoy and Wind direction was recorded using a compass and a weathervane. Percent cloud cover and visibilities were estimated using standardized codes.

Average air and sea surface temperatures increased throughout the season (Table 1). Wind speed decreased throughout the season and the sea surface state correspondingly decreased (Table 2, Table 3). A total of 17.9 inches of rain fell this season compared to 13.2 inches in 2005. Several storms produced a lot of rain in short periods of time, the most notable resulted in 4.5 inches of precipitation between the 11<sup>th</sup> and the 12<sup>th</sup> of July.

Strong winds were recorded on one occasion: 38 mph on 9 May. The 2006 field season averaged similar to 2005. The sea surface temperature was warmer but the ocean did not take longer to warm up this season than in 2005.

**Table 1.** Air and sea surface temperatures (°F) throughout the 2006 season, Outer Green Island, Maine.

	Mean Temperature	High Temperature	Low Temperature	Mean SST	Maximum SST	Minimum SST
May	47.9	51	39	47.4	53	45
June	63.2	71	52	60.4	54	54
July	68.0	78	64	65.3	69	64
Season	60.1	71	39	59.4	69	45

**Table 2.** Wind speed and precipitation observations throughout the 2006 season, Outer Green Island, Maine.

	Mean Wind Speed (mph)	Maximum Wind Speed (mph)	Total Precipitation (in)	# Days with Precipitation
May	14.1	38	3.83	8
June	6.8	17	7.41	15
July	6.6	22	6.68	10
Season	14.1	38	17.9	33

**Table 3.** Mean percent cloud cover, sea surface condition, and visibility, and # days with fog observations throughout the 2006 season, Outer Green Island, Maine.

	% Cloud Cover*	Sea Surface Conditions**	Visibility (miles)	# Days with Fog
May	3.93	2.86	4.20	5
June	2.92	2.32	4.63	11
July	3.12	2.26	5.36	5
Season	3.32	2.48	4.73	21

\*Cloud cover: 1 = 0-25%, 2 = 26-50%, 3 = 51-75%, 4 = 76-100%, 5 = Fog

\*\*Sea surface condition: 1 = waves < 1 ft., 2 = waves 1-2 ft., 3 = waves 2-4 ft., 4 = waves 5-8 ft, 5 = waves > 8 ft.

**Table 4.** Outer Green Island weather summary 2002-2006

	Ave. Temp.	High Temp.	Low Temp.	Ave. SST	Max. SST	Min. SST	Ave. Wind Speed	Total Precip.	Fog Days
2002	67.0	103	47	54.5	63	50	5.2	Na	9
2003	63.5	84	33	52.6	64	42	5.7	6.0	15
2004	59.8	80	40	54.3	67	45	7.3	8.8	27
2005	60.0	81	39	56.0	63	42	8.1	13.1	13
2006	61.4	78	39	59.5	69	45	6.7	17.9	17

## Predator Monitoring, Management, and Control

### Great Black-backed and Herring Gulls

In contrast to recent previous tern restoration efforts in Maine, the removal of nesting Herring and Great Black-backed Gulls from Outer Green was accomplished using primarily non-lethal

methods. While the use of DRC 1339 can be an effective tool for quickly eradicating large numbers of gulls, public dissention and the innovative and successful non-lethal restoration programs on White-Seavey Island, NH, and Country Island, NS, convinced Audubon staff that it was important to try a largely non-lethal gull removal program on Outer Green Island. This approach has been employed since the project's inception in 2002. The methods used on the White-Seavey Island restoration program were adopted for use on Outer Green. This consisted of twice-daily gull walks, shooting pyrotechnics, and wearing high visibility vests. In addition, problem gulls were removed from the island with a .22 caliber rifle.

Twice-daily gull walks were conducted half an hour before sunrise and half an hour before sunset to deter loafing gulls. Additional scaring was conducted if gulls were observed loafing during the middle of the day. During gull walks, the perimeter and interior of the island were searched for evidence of gull nests. Species was determined by observing attending parents at nests and by measuring egg circumference. All gull eggs found were destroyed and the nest materials were scattered to discourage the birds from re-nesting. Nest locations were marked with red spray paint to aid in tracking re-nesting birds. Twenty-eight HERG nests containing 36 eggs were destroyed throughout the season. 8 GBBG nests containing 15 eggs were also destroyed during the season (Table 5). Herring Gulls were persistent in 2006 with nests continuing to be discovered until 23<sup>rd</sup> July. Eight gulls (4 Herring and 4 black-backed) were shot on the island this season.

**Table 5.** Number of HERG and GBBG nests destroyed and gulls shot, Outer Green Island, Maine, 2006.

Species	Number of eggs destroyed	Number of nests destroyed	Number of gulls shot
Herring Gull	36	28	4
Great Black-backed Gull	15	8	4
Season	51	32	8

**Table 6.** Trend of gull nesting effort (# nests destroyed), Outer Green Island, Maine, 2003-2006.

	2003	2004	2005	2006
Herring Gull	25	30	48	28
Great Black-backed Gull	13	3	33	8
Season	38	33	81	32

### Predators

Unlike 2005 there were no significant predators during the 2006 season. In May numerous tern eggs were predated by gulls on the east edge of the colony. This caused the colony to move back towards the middle of the island. On 4<sup>th</sup> July a single HERG was seen taking older chicks 3 different times.

A single Peregrine Falcon was seen flying through the colony six different times in July. The Peregrine Falcon was observed killing adult terns on two different occasions. The constant

harassment from the falcon caused the terns to leave their nest, which resulted in eggs and young chicks being exposed to the elements. Unfortunately, this did result in an increase in mortality.

## Terns

### Common Tern Phenology

- 5 May – first terns seen flying around the island
- 16 May – 300 terns seen flying around the island
- 19 May – 1000 terns seen flying around the island
- 31 May – first nests found on the island
- 19 June – GOMSWG census, 732 nests
- 19 June – first chicks hatched
- 14 July – first fledgling seen flying

### Roseate Tern Phenology

- 19 May – first terns heard over the island
- 23 May – pair of terns seen landing in the colony
- 31 May – first nest found
- 20 June – GOMSWG census, 6 nests
- 17 July – first fledger seen flying

### GOMSWG Census

We conducted the 2006 GOMSWG tern census on 19 June. The island is divided into 22 permanently marked grid squares. All tern nests were counted by walking at arms length across each grid square. The number of nests and the clutch size of each nest in each island sector were recorded. The total island tern nest count was 732 nests (a corrected total of 657 nests counted plus 75 nests in productivity and feeding plots; Table 7).

**Table 7.** GOMSWG census nest totals for Common Tern, 20 June 2006, Outer Green Island, Maine.

Year	2003	2004	2005	2006
GOMSWG	94	497	971	732
Post-GOMSWG	66	185	N/A	N/A

During the census, each nest in grid squares 13, 16, and 19 was marked with a wooden stick. A transect was then walked through the marked grid squares to record the number of marked and unmarked nests. The ratio of marked to unmarked nests was used to calculate the Lincoln Index for observer error:

$$\text{Lincoln Index} = \# \text{ marked nests} + \# \text{ unmarked nests} / \# \text{ marked nests}$$

This year the ratio of marked to unmarked nests was 250 marked / 7 unmarked:

$$\text{Lincoln Index} = 250 \text{ marked} + 7 \text{ unmarked} / 250 \text{ marked} = 1.03$$

When applied to the direct nest count of 638, the result is 657 nests. With the additional 75 nests in productivity and feeding studies, the GOMSWG total is 732 nests. There was no second census. This year, nests were initiated around the entire perimeter of the island. The core of the colony was located along the mid-portion of the eastern ledge and on the south end.

### Productivity

Common Tern productivity (hatching success and fledging success) was monitored by following chicks for 15 days in four enclosures and four feeding study plots (n = 75 total nests). Enclosures and feeding study plots were checked every other day until hatching, then every day until all eggs hatched. Chicks in the productivity plots were weighed and measured every other day. Chicks reaching 15 days of age were considered fledged; however, if chicks were found dead after 15 days, productivity was adjusted to reflect the deaths.

Common Tern productivity was 1.13 chicks/nest, up from 0.65 in 2005. The average clutch size and the average number of chicks hatched per nest increased from 2005 (Table 9). As the colony has increased in size, nest density has increased. Nests were located every 2 feet, and occasionally within a foot. The high density probably resulted in increased competition for food between chicks and an increase in the number of aggressive interactions between neighboring pairs and offspring. Researcher's regularly observed adults flying off with young chicks and dropping them in the water. The principal factors affecting tern productivity on Outer Green in 2006 were weather and habitat. The rapid growth and dense the Indian Mustard on the south end did not allow adults to return to their nests with food.

**Table 9.** Clutch Size, Hatching Success, and Fledging Success of Common Terns, 2003-2006, Outer Green Island, Maine.

	2003	2004	2005	2006
Clutch Size	2.64	2.26	2.22	2.35
Hatching Success	2.45	1.92	1.69	1.92
Fledging Success	2.09	1.45	0.67	1.13

There was wide variation in productivity between the plots (Table 10). Some of the variation may be explained by the time of laying and the experience of adults. The east ledge was colonized first with the colony then spreading southward. It is likely that terns nesting earlier are more experienced and thus more likely to raise more young. Predation, weather and nest site competition were likely the strong selective pressures on OGI in 2006. Early gull predation prevented early nesting on the island. Inclement weather did not affect nesting until June and July. In addition, much of the colony was subject to increased competition and aggressive behaviors due to the high density. This seemed to be especially important in Diagon Alley and Solar Plot with the two youngest broods growing at a much slower rate than the other chicks in the plot.



**Table 10.** Reproductive success of Common Terns in Feeding Study and Productivity Plots, Outer Green Island, Maine, 2006.

Location	# of Nests	# of Eggs	Mean Clutch Size	# Hatched	# Fledged	Hatch Success %	Fledge Success %	# Fledged/nest
<u>Productivity Plots</u>								
Diagon Alley	13	34	2.62	28	18	82.4	53.0	1.38
Rivendell	3	7	2.33	5	3	71.4	43.5	1.00
Don&Mike	8	11	1.38	4	4	36.4	36.4	0.50
Solar Plot	27	62	2.30	49	20	79.0	32.2	0.74
All Productivity Plots	51	114	2.24	86	45	75.4	39.4	0.88
<u>Feeding Study Plots</u>								
Fillmore East	6	15	2.50	13	12	86.7	80.0	2.00
Isengard	6	18	3.00	18	8	100	44.4	1.33
Azkaban	6	16	2.66	14	8	87.5	50.0	1.33
Solar Tower	6	13	2.17	13	12	100	92.3	2.00
All Feeding Plots	24	62	2.58	58	40	93.5	64.5	1.66
Overall	75	176	2.35	144	85	81.8	48.3	1.13

Tern chick survival depends largely on hatch order. In general, the first chick to hatch in a nest has a greater chance of fledging. In the feeding study and productivity plots, the first, second, and third chicks to hatch are designated the “A”, “B”, and “C” chicks, respectively. Chicks in nests containing only one egg are referred to as “O” chicks. Hatching success was determined in relation to hatch order. Hatching success for “A”, “B”, “C”, and “O” chicks was 1.05, 0.77, 0.64, and 0.33, respectively (Table 11). Fledging success for “A”, “B”, “C”, and “O” chicks were 0.79, 0.44, 0.09 and 0.33 respectively.

**Table 11.** Hatching Success and Fledgling Success of “A”, “B”, “C”, and “O” Common Tern chicks, Outer Green Island, Maine, 2006.

	<b>Diagon Alley</b>	<b>Rivendell</b>	<b>Don&amp;Mike</b>	<b>Solar Plot</b>	<b>Solar Tower</b>	<b>Fillmore East</b>	<b>Isengard</b>	<b>Azkaban</b>	<b>Total</b>
# Nests	13	3	8	27	6	6	6	6	75
1 egg clutches	0	0	6	3	0	0	0	0	9
2 egg clutches	5	2	1	14	5	3	0	2	32
3 egg clutches	8	1	1	10	1	3	6	4	34
<b>“A” Chicks</b>	<b>Diagon Alley</b>	<b>Rivendell</b>	<b>Don&amp;Mike</b>	<b>Solar Plot</b>	<b>Solar Tower</b>	<b>Fillmore East</b>	<b>Isengard</b>	<b>Azkaban</b>	<b>Total</b>
# Eggs	13	3	2	24	6	6	6	6	66
# Hatched	13	2	1	23	6	6	6	6	63
# Fledged	12	2	1	14	6	6	6	2	49
Hatching Success	1.0	0.66	0.50	0.96	1.00	1.00	1.0	1.00	0.95
Fledging Success	0.92	0.66	0.50	0.58	1.00	1.00	1.0	0.83	0.74
<b>“B” Chicks</b>	<b>Diagon Alley</b>	<b>Rivendell</b>	<b>Don&amp;Mike</b>	<b>Solar Plot</b>	<b>Solar Tower</b>	<b>Fillmore East</b>	<b>Isengard</b>	<b>Azkaban</b>	<b>Total</b>
# Eggs	13	3	2	24	6	6	6	6	66
# Hatched	9	2	1	21	6	5	6	6	56
# Fledged	5	1	1	4	6	5	4	3	29
Hatching Success	0.69	0.66	0.50	0.86	1.0	0.83	1.00	1.00	0.84
Fledging Success	0.38	0.33	0.50	0.17	1.0	0.83	0.66	0.50	0.43
<b>“C” Chicks</b>	<b>Diagon Alley</b>	<b>Rivendell</b>	<b>Don&amp;Mike</b>	<b>Solar Plot</b>	<b>Solar Tower</b>	<b>Fillmore East</b>	<b>Isengard</b>	<b>Azkaban</b>	<b>Total</b>
# Eggs	8	1	1	12	1	3	6	4	36
# Hatched	6	0	0	8	1	2	6	2	25
# Fledged	1	0	0	1	0	1	0	0	3
Hatching Success	0.75	0.00	0.00	0.66	1.00	0.66	1.00	0.50	0.69
Fledging Success	0.13	0.00	0.00	0.83	0.00	0.33	0.00	0.00	0.08
<b>“O” Chicks</b>	<b>Diagon Alley</b>	<b>Rivendell</b>	<b>Don&amp;Mike</b>	<b>Solar Plot</b>	<b>Solar Tower</b>	<b>Fillmore East</b>	<b>Isengard</b>	<b>Azkaban</b>	<b>Total</b>
# Eggs	--	--	6	3	--	--	--	--	9
# Hatched	--	--	2	2	--	--	--	--	4
# Fledged	--	--	2	1	--	--	--	--	3
Hatching Success	--	--	0.33	0.66	--	--	--	--	0.44
Fledging Success	--	--	0.33	0.33	--	--	--	--	0.33

## Chick Provisioning

Feeding studies were conducted on 24 nests in 4 locations for a total of 895 observation hours. With a total of 1777 feedings recorded, the average feeding rate was 1.99 feedings/hour. This year the major prey items delivered were hake and herring (Table 12).

**Table 12.** Diet of Common Tern chicks in 2006, Outer Green Island, Maine.

<b>Prey Item</b>	<b>Number of items</b>	<b>Percent of Diet</b>	<b>Average Size</b>
Hake	671	37.7	1.22
Herring	627	35.3	1.52
Lumpfish	151	8.49	0.49
Unknown Fish	103	5.81	1.04
Ant	93	5.23	0.25
Butterfish	48	2.70	1.08
Unknown	35	1.98	0.33
Pollock	11	0.64	1.82
Fish Scrap	7	0.40	0.93
Insect	7	0.39	0.71
Amphipod	6	0.34	0.25
Stickleback	5	0.29	1.05
Silverside	3	0.17	2.50
Unknown Invertebrate	2	0.11	0.25
Rosefish	2	0.11	2.50
Moth	2	0.11	0.25
Bluefish	1	0.06	1.50
Cunner	1	0.06	1.25
Rock Eel	1	0.06	0.75
Sand Lance	1	0.06	3.00
<b>Totals</b>	<b>1777</b>	<b>100</b>	<b>1.18</b>

## Chick Growth

Chick growth studies were studied on 37 chicks in 4 different locations. Chick weights were measured every two days until the chick was fledged using a Pesola scale. This data was used to calculate the asymptotic mass (peak weights for chicks 17 – 26 old) and linear growth rate (average daily mass gain for chicks 3 – 13 days old). The asymptotic mass was 111.1 g which is a decrease from 119.5 g in 2005. The linear growth rate was 6.6 g/day which was an increase from 5.0 g/day in 2005. The figure below summarizes all of the data.

Figure: COTE Asymptotic Mass and Linear Growth Rates in 2005 – 2006. Outer Green, Maine.

<b>AOU</b>	<b>Year</b>	<b>Sample Size</b>	<b>Asymptotic Mass</b>	<b>Linear Growth Rate</b>
COTE	2005	24	119.5 g	5.0 g/day
COTE	2006	37	111.1 g	6.6 g/day

## Common Eider

Common Eiders (*Somateria mollissima*) did nest successfully this season. There were a minimum of 13 nests this year; two were predated by gulls. We recorded a high count of 27 ducklings around the island. In 2005 no nests hatched successfully.

## Leach's Storm-Petrel

This is the third year of a Leach's Storm-Petrel attraction program on Outer Green Island. Historically, Leach's Storm Petrels were known to nest as far west in Maine as Casco Bay. Petrel burrows were noted on OGI in 1914, and as late as 1918 in Casco Bay (White Bull Island). Presently petrels do not breed west of Muscongus Bay, however individuals have been consistently observed at night on Pond Island NWR at the mouth of the Kennebec River.

A sound system broadcasting flight and burrow calls were installed on the island in May. A series of 21 artificial burrows were created using nest boxes and peat. The burrows and sound system were located on the northern end of the island in grid #6. The burrow entrances faced the east and burrows were located between the speakers. Nest boxes were constructed out of wood and had plastic tubing for entrances. The burrow, entrance tubes, and the area just outside the tubes were covered with peat. The burrows were numbered and toothpicks were placed on end in the burrow entrances to monitor activity in the burrows.

Leach's Storm-Petrels were heard on 6 different occasions. On 24<sup>th</sup> July researchers heard several petrels flying around camp near the tent platforms. On each occasion fog was present around the island. A musky smell was present around the speakers from June through July.

## Other Notable Species

### Black Guillemot

There were 7 burrows found around the perimeter of the island. The nest on the northeast end contained 2 eggs and hatched 1 chick. The nest on the southwest end hatched 2 chicks. A third location just north of the landing on the west side of the island hatched 1 chick. There were 4 burrows found in 2005. Researchers could only get to 3 burrows.

## Plant Species

Cow Parsnip (*Heracleum maximum*)  
Stinging Nettles (*Urtica dioica*)  
Pineapple Weed (*Matricaria matricarioides*)  
Red-Berried Elder (*Sambucus pubens*)  
Common Burdock (*Arctium minus*)  
Beach Pea (*Lathyrus japonicus*)  
Charlock (*Brassica kaber*)  
Common Mallow (*Malva neglecta*)  
Common Chickweed (*Stellaria media*)

Common Dandelion (*Taraxcum officinale*)  
Hedge Bindweed (*Convolvulus sepium*)  
Curled Dock (*Rumex crispis*)  
Hedge Mustard (*Sisymbrium officinale*)  
Shepards Purse (*Capsella bursa-pastoris*)  
Wild Radish (*Raphanus raphanistrum*)  
Salt-Marsh Sand Spurrey (*Spergularia marina*)  
Motherwort (*Leonurus cardiaca*)  
Bittersweet Nightshade (*Solanum dulcamara*)  
Bitter Dock (*Rumex obtusifolius*)  
Carrion Flower (*Smilax herbacea*)  
Wild Chamomile (*Anthemis chamomilla*)  
Common Ragweed (*Ambrosia artemisiifolia*)  
Field Pennycress (*Thlaspi arvense*)  
Common Morning Glory (*Ipomoea purpurea*)  
Indian Mustard (*Brassica juncea*)

### Butterfly Species

The following is an abbreviated list of the butterflies observed on Outer Green Island this season. A field guide was not available for the first part of the season.

Eastern Tiger Swallowtail (*Papilio glaucus*)  
Cabbage White (*Pieris rapae*)  
Question Mark (*Polygonia interrogtionis*)  
Eastern Comma (*Polygonia comma*)  
Milbert's Tortoiseshell (*Nymphalis milberti*)  
Red Admiral (*Vanessa atalanta*)  
White Admiral (*Limentis arthemis*)  
European Skipper (*Thymelicus lineola*)  
Delaware Skipper (*Anatrytone logan*)

### Bird List Summary

Through the season, 118 species of birds were seen on or from the island (Appendix B). During the 2002 field season 117 bird species were observed and in 2005 129 were sighted. The island remains a major migration stop for songbirds. The highlights include Bridled Tern, Sooty Tern and Magnificent Frigatebird. This was the second year of mist netting on the island. Three nets were set up from May 6 through the end of the month. Researchers captured 146 birds and 36 species in 284.5 hours. The hours were low due to inclement weather. Appendix 1 shows the species captured during the month of May.

## 2006 Island Staff List and Dates

- Matthew Martinkovic (Island Supervisor): 10 May – 6 August
- Scott Hall (Research Coordinator): 5 May – 8 May
- Paula Shannon (Matinicus Rock Supervisor): 5 May – 16 May
- Frank Mayer (Resident Intern M.R.): 5 May – 16 May
- Juliet Lamb (Intern): 16 May – 24 May; 17 June – 26 June
- Robbie Lambert (Resident Intern--Stratton): 31 May – 5 June
- Ellen Peterson (Volunteer): 31 May – 5 June
- Nick Methany (Intern): 5 June – 11 June
- Emily Runnels (Intern): 11 June – 17 June
- Bob Houston (USF&W): 19 June – 19 June
- Marlene Rodriguez (Intern): 19 June – 19 June
- Charlie Governali (Volunteer): 24 June – 28 June
- Beth MacCleod (Intern): 26 June – 10 July
- Noah Stryker (Volunteer): 10 July – 15 July
- Ian Martin (Intern): 15 July – 27 July

## Acknowledgements

I would like to express my appreciation for all the contributions that made the restoration efforts on Outer Green Island possible this season. The success the island had this season would not have happened if it wasn't for the following groups and individuals:

- Casco Bay Estuary Partnership for support through a grant from the Casco Bay Habitat Restoration Fund.
- The National Audubon Society Seabird Restoration Program: Steve Kress, Rose Borzik, Scott Hall, Pete Salmansohn, Debbie Wood.
- Scott Hall for help opening and for all the advice.
- Paula Shannon and Frank Mayer for opening the island.
- Robby Lambert and Ellen Peterson for watching the island during orientation.
- Wing Goodale for all the help throughout the season.
- Juliet Lamb, Nick Methany, Emily Runnels, Marlene Rodriguez, Charlie Governali, Beth Macleod, Noah Stryker, Ian Martin for all their hard work and friendship.
- Jeff Kimmons for all the great laughs.
- Clark Smith and friends for providing logistical support, laughs and beverages.
- Bob Houston for logistical support, doughnuts, sandwiches. He always goes above and beyond the call of duty.
- John D. Dalton and etal. Town of Falmouth Harbor Master, for the use of the boat launch.
- Bob Savage from Maine Audubon for the use of their storage facility.
- Holy Martyrs Parish for providing parking space for volunteers and me.

- Finally, to everyone involved with Project Puffin over the past six years. I consider everyone family. Thanks.

## Needs and Wish List/Island Recommendations for 2006

### Needs

- A better siphon system
- Weather Wizard computer and new main cord.
- New Burlap
- Scientific Calculator
- Another scope and tripod
- Can Opener (not with gears, but like you find on a Swiss Army knife)
- Cabin
- Repair and modifications for better kitchen
- Lower bottom of window opposite door in Fillmore blind by at least 6 inches
- More ethanol and formalin and larger sample jars for collecting fish
- More complete First Aid Kit (NEED: band-aids, tweezers, triangular bandage, burn cream, safety pins, medical tape, rubber gloves, Q-tips; also see inventory list)
- Red paint for marking gull nests (there is plenty of orange paint if OK to use)
- Book on tern behavior and natural history

### Appendix List

Appendix 1: Mist Netting Summary 2006 OGI

Appendix 2: Outer Green Island 2006 Bird List

Appendix 3: Outer Green Island colony map

## Appendix 1: Mist Netting Summary 2006 OGI

spcd	species	orig	recap
WTSP	White-throated Sparrow	24	2
COYE	Common Yellowthroat	11	0
SWSP	Swamp Sparrow	7	0
MAWA	Magnolia Warbler	14	0
SAVS	Savannah Sparrow	5	0
SOSP	Song Sparrow	9	5
YWAR	Yellow Warbler	4	0
AMGO	American Goldfinch	1	0
GRCA	Gray Catbird	3	2
RBGK	Rose-Breasted Grosbeak	2	0
CSWA	Chestnut-sided Warbler	4	0
LISP	Lincoln's Sparrow	1	0
SPSA	Spotted Sandpiper	5	0
AMRE	American Redstart	3	0
NOWA	Northern Water-thrush	1	0
LEFL	Least Flycatcher	2	0
MOWA	Mourning Warbler	1	0
PISI	Pine Siskin	1	0
BLPW	Blackpoll Warbler	4	0
EATO	Eastern Towhee	2	0
MYWA	Myrtle Warbler	1	0
NOPA	Northern Parula	1	0
REVI	Red-eyed Vireo	7	0
CEWW	Cedar Waxwing	1	0
WIFL	Willow Flycatcher	1	0
BAOR	Baltimore Oriole	1	1
BANS	Bank Swallow	1	0
BAWW	Black-and-White Warbler	3	0
BLBW	Blackburnian Warbler	1	0
PAWA	Palm Warbler	1	0
EAWP	Eastern Wood-Pewee	1	0
CAWA	Canada Warbler	1	0
CHSP	Yellow-bellied Flycatcher	2	0
TRFL	Trail's Flycatcher	11	0
ZZZZ	Total	146	10



## Appendix 2: Outer Green Island 2006 Bird List.

Common Name	First Sighting	Last Sighting	First Max Count Date	Max Count	Cumulative Count	#Days Seen
American Crow	5/6/2006	5/10/2006	5/10/2006	2	6	4
American Goldfinch	5/5/2006	6/29/2006	6/29/2006	4	20	13
American Oystercatcher	5/6/2006	7/8/2006	7/8/2006	2	3	2
American Redstart	5/21/2006	6/6/2006	6/6/2006	4	10	5
American Robin	7/2/2006	7/15/2006	7/15/2006	3	5	2
Arctic Tern	6/19/2006	7/23/2006	7/23/2006	3	19	12
Atlantic Puffin	7/8/2006	7/8/2006	7/8/2006	2	2	1
Baltimore Oriole	5/18/2006	5/21/2006	5/21/2006	2	5	3
Bank Swallow	5/6/2006	7/22/2006	7/22/2006	20	84	52
Barn Swallow	5/5/2006	7/2/2006	7/2/2006	12	37	12
Bay-breasted Warbler	5/22/2006	5/22/2006	5/22/2006	1	1	1
Black Guillemot	5/5/2006	7/23/2006	7/23/2006	35	885	59
Black Scoter	5/6/2006	7/13/2006	7/13/2006	700	756	5
Black Tern	6/26/2006	6/26/2006	6/26/2006	2	2	1
Black-and-White Warbler	5/5/2006	5/21/2006	5/21/2006	2	6	5
Black-billed Cuckoo	6/2/2006	7/2/2006	7/2/2006	1	4	4
Blackburnian Warbler	5/19/2006	6/2/2006	6/2/2006	1	2	2
Black-crowned Night-Heron	6/2/2006	7/22/2006	7/22/2006	2	5	4
Blackpoll Warbler	5/21/2006	6/29/2006	6/29/2006	3	10	7
Black-throated Green Warbler	5/21/2006	6/20/2006	6/20/2006	1	2	2
Blue Jay	5/18/2006	5/18/2006	5/18/2006	5	5	1
Bobolink	6/1/2006	6/23/2006	6/23/2006	1	2	2
Bonaparte's Gull	5/23/2006	6/3/2006	6/3/2006	4	7	3
Brant	5/17/2006	7/17/2006	7/17/2006	5	8	3
Bridled Tern	6/19/2006	7/27/2006	7/27/2006	1	18	18
Brown Thrasher	5/17/2006	5/17/2006	5/17/2006	1	1	1

<b>Common Name</b>	<b>First Sighting</b>	<b>Last Sighting</b>	<b>First Max Count Date</b>	<b>Max Count</b>	<b>Cumulative Count</b>	<b>#Days Seen</b>
Canada Goose	5/5/2006	5/5/2006	5/5/2006	1	1	1
Canada Warbler	6/1/2006	6/1/2006	6/1/2006	2	2	1
Cedar Waxwing	6/3/2006	6/6/2006	6/6/2006	2	3	2
Chestnut-sided Warbler	5/18/2006	6/1/2006	6/1/2006	2	5	4
Chimney Swift	6/26/2006	6/26/2006	6/26/2006	1	1	1
Common Eider	5/6/2006	7/23/2006	7/23/2006	300	4596	70
Common Grackle	5/18/2006	5/18/2006	5/18/2006	1	1	1
Common Loon	5/5/2006	7/21/2006	7/21/2006	16	42	17
Common Murre	6/11/2006	7/15/2006	7/15/2006	2	4	3
Common Tern	5/5/2006	6/20/2006	6/20/2006	1464	19835	34
Common Yellowthroat	5/5/2006	6/18/2006	6/18/2006	20	75	24
Dark-eyed Junco	5/5/2006	5/24/2006	5/24/2006	2	3	2
Double-crested Cormorant	5/7/2006	7/23/2006	7/23/2006	50	875	54
Eastern Kingbird	5/18/2006	7/16/2006	7/16/2006	1	9	9
Eastern Meadowlark	6/1/2006	6/5/2006	6/5/2006	1	4	4
Eastern Towhee	5/5/2006	5/23/2006	5/23/2006	3	22	16
Eastern Wood-Pewee	6/1/2006	6/15/2006	6/15/2006	2	4	3
Glossy Ibis	5/18/2006	7/6/2006	7/6/2006	6	19	8
Gray Catbird	5/17/2006	6/6/2006	6/6/2006	3	14	8
Great Black-backed Gull	5/6/2006	7/23/2006	7/23/2006	46	749	55
Great Blue Heron	5/5/2006	7/21/2006	7/21/2006	2	10	7
Great Crested Flycatcher	6/13/2006	6/13/2006	6/13/2006	1	1	1
Great Egret	5/19/2006	6/15/2006	6/15/2006	2	3	2
Greater Yellowlegs	5/5/2006	7/22/2006	7/22/2006	5	16	8
Hermit Thrush	5/5/2006	5/7/2006	5/7/2006	1	3	3
Herring Gull	5/6/2006	7/23/2006	7/23/2006	48	799	55
Killdeer	6/26/2006	6/26/2006	6/26/2006	1	1	1
Laughing Gull	5/5/2006	7/23/2006	7/23/2006	8	74	43

Common Name	First Sighting	Last Sighting	First Max Count Date	Max Count	Cumulative Count	#Days Seen
Leach's Storm-Petrel	6/3/2006	7/19/2006	7/19/2006	2	5	4
Least Flycatcher	5/17/2006	6/1/2006	6/1/2006	1	3	3
Least Sandpiper	5/16/2006	7/23/2006	7/23/2006	25	109	23
Lincoln's Sparrow	5/18/2006	7/17/2006	7/17/2006	1	3	3
Long-tailed Duck	6/14/2006	7/6/2006	7/6/2006	2	5	4
Magnificent Frigatebird	5/20/2006	5/20/2006	5/20/2006	1	1	1
Magnolia Warbler	5/16/2006	6/17/2006	6/17/2006	5	33	15
Merlin	5/5/2006	6/21/2006	6/21/2006	2	7	6
Mourning Dove	7/7/2006	7/7/2006	7/7/2006	1	1	1
Mourning Warbler	6/1/2006	6/5/2006	6/5/2006	1	2	2
Northern Flicker (Yellow shafted)	5/8/2006	5/8/2006	5/8/2006	1	1	1
Northern Gannet	5/6/2006	7/23/2006	7/23/2006	97	152	10
Northern Mockingbird	5/20/2006	5/20/2006	5/20/2006	1	1	1
Northern Parula	5/17/2006	6/18/2006	6/18/2006	1	5	5
Northern Waterthrush	5/17/2006	6/1/2006	6/1/2006	1	3	3
Osprey	6/2/2006	7/7/2006	7/7/2006	1	3	3
Ovenbird	5/17/2006	5/20/2006	5/20/2006	1	3	3
Palm Warbler	5/8/2006	5/8/2006	5/8/2006	3	3	1
Parasitic Jaeger	6/3/2006	6/3/2006	6/3/2006	2	2	1
Peregrine Falcon	5/19/2006	7/15/2006	7/15/2006	1	8	8
Pine Siskin	5/8/2006	5/8/2006	5/8/2006	1	1	1
Purple Sandpiper	6/1/2006	6/1/2006	6/1/2006	6	6	1
Razorbill	6/21/2006	7/7/2006	7/7/2006	3	8	4
Red Knot	6/3/2006	6/3/2006	6/3/2006	1	1	1
Red-breasted Nuthatch	5/6/2006	5/21/2006	5/21/2006	2	6	5
Red-eyed Vireo	6/1/2006	6/15/2006	6/15/2006	7	12	4
Red-throated Loon	5/23/2006	6/2/2006	6/2/2006	2	4	2
Red-winged Blackbird	5/17/2006	6/13/2006	6/13/2006	1	5	5

<b>Common Name</b>	<b>First Sighting</b>	<b>Last Sighting</b>	<b>First Max Count Date</b>	<b>Max Count</b>	<b>Cumulative Count</b>	<b>#Days Seen</b>
Ring-billed Gull	6/1/2006	6/1/2006	6/1/2006	2	2	1
Rock Dove	6/26/2006	6/26/2006	6/26/2006	1	1	1
Roseate Tern	5/17/2006	7/18/2006	7/18/2006	20	377	42
Rose-breasted Grosbeak	5/17/2006	5/18/2006	5/18/2006	1	2	2
Royal Tern	6/3/2006	7/13/2006	7/13/2006	1	3	3
Ruby-crowned Kinglet	5/5/2006	5/17/2006	5/17/2006	12	26	5
Ruby-throated Hummingbird	5/16/2006	6/6/2006	6/6/2006	2	10	8
Ruddy Turnstone	5/31/2006	7/23/2006	7/23/2006	45	122	11
Rusty Blackbird	5/5/2006	5/5/2006	5/5/2006	1	1	1
Savannah Sparrow	5/5/2006	5/21/2006	5/21/2006	10	36	11
Semipalmated Sandpiper	5/19/2006	7/8/2006	7/8/2006	3	9	5
Sharp-shinned Hawk	5/5/2006	5/5/2006	5/5/2006	1	1	1
Short-billed Dowitcher	5/19/2006	7/22/2006	7/22/2006	45	201	19
Snowy Egret	5/18/2006	6/13/2006	6/13/2006	2	5	3
Song Sparrow	5/5/2006	7/23/2006	7/23/2006	5	69	61
Sooty Shearwater	6/3/2006	6/3/2006	6/3/2006	2	2	1
Sooty Tern	6/17/2006	6/17/2006	6/17/2006	1	1	1
Spotted Sandpiper	5/5/2006	7/22/2006	7/22/2006	5	64	61
Surf Scoter	5/5/2006	5/5/2006	5/5/2006	2	2	1
Swainson's Thrush	5/5/2006	6/1/2006	6/1/2006	1	3	3
Swamp Sparrow	5/5/2006	6/5/2006	6/5/2006	5	15	7
Traill's Flycatcher	6/2/2006	6/15/2006	6/15/2006	4	6	3
Tree Swallow	5/6/2006	7/23/2006	7/23/2006	13	27	8
Veery	5/19/2006	5/19/2006	5/19/2006	1	1	1
Whimbrel	5/5/2006	5/5/2006	5/5/2006	1	1	1
White-throated Sparrow	5/5/2006	5/23/2006	5/23/2006	50	116	11
White-winged Scoter	5/9/2006	7/13/2006	7/13/2006	25	69	6
Willet	7/6/2006	7/22/2006	7/22/2006	8	13	3

Common Name	First Sighting	LastSighting	First Max Count Date	Max Count		Cumulative Count
Willow Flycatcher	6/5/2006	6/5/2006	6/5/2006	2	2	1
Wilson's Storm-Petrel	6/26/2006	7/23/2006	7/23/2006	25	34	8
Wilson's Warbler	5/19/2006	5/20/2006	5/20/2006	1	2	2
Yellow Warbler	5/5/2006	7/23/2006	7/23/2006	4	31	25
Yellow-bellied Flycatcher	6/1/2006	6/18/2006	6/18/2006	2	7	5
Yellow-bellied Sapsucker	7/16/2006	7/17/2006	7/17/2006	1	2	2
Yellow-billed Cuckoo	6/26/2006	6/26/2006	6/26/2006	1	1	1
Yellow-rumped Warbler	5/5/2006	6/12/2006	6/12/2006	2	9	7

Species Total: 118

*\*Data come from both 0600 and Daily Counts. Max count may have occurred on more than one day over the summer; the first date when the max count occurred is provided (First Max Count Date). Cumulative count is a sum of daily maximum counts (not a sum of all counts). # of days seen is the total number of days the species was recorded on the island.*



Appendix 3: Outer Green Island colony map



