

**CAPE HATTERAS NATIONAL SEASHORE
COLONIAL WATERBIRD MONITORING
2010 ANNUAL REPORT**



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ABSTRACT

In 2010 colonial waterbird monitoring at Cape Hatteras National Seashore (CAHA) consisted of identifying and protecting active colonies as well as conducting a single walk-through nest survey. This year Bodie/Hatteras District contained five colonies, Hatteras District contained three colonies and Ocracoke contained two colonies. To minimize disturbance to the colonies, only one walk through was conducted during the peak nesting period.

The Consent Decree (CD) states that for colonial waterbirds, in lieu of providing an annual report, NPS shall provide the data collected on colonial waterbird breeding activity. This report has been prepared by CAHA resources management staff to include not only a summary of the data collected, but also additional species-related information not specifically required by the CD.

INTRODUCTION

CAHA is located along the northern Outer Banks region of North Carolina. Consisting of more than 30,000 acres distributed along approximately 66.8 miles of shoreline, it is part of a dynamic barrier island system. CAHA provides traditional nesting habitat for several species of special concern and state-listed colonial-nesting waterbirds, including the common tern (*Sterna hirundo*), least tern (*Sterna antillarum*), gull-billed tern (*Gelochelidon nilotica aranea*), and black skimmer (*Rhynchops niger*). The federally threatened piping plover (*Charadrius melodus*), and the American oystercatcher (*Haematopus palliatus*), a North Carolina species of special concern, also nest on the seashore. Over the years there has been different levels of staffing and hence different levels of monitoring and data collection for colonial waterbird breeding activity. The varying levels of effort over the years make it difficult to compare results from one year to the next.

Colonial-nesting waterbirds (CWB) refer to those species of birds that nest in large groups or colonies and obtain their food from the water. Terns, gulls, pelicans, skimmers, and cormorants are all examples of CWBs. Terns and skimmers nest above the high-tide line in sand, gravel, or shell beds.

The least tern (LETE), the smallest of the terns and gulls, is the most prevalent of the four species of CWBs monitored at CAHA. They are gray and white with a black cap, a white forehead, yellow legs, and a yellow bill with a black tip. Courtship typically takes place at the nesting site. Like all terns and skimmers, the male will entice a female through a method known as fish flashing, in which he presents her with a fish. Upon acceptance, the pair will copulate and scrape. LETEs nest on sandy beaches close to the water. A clutch of 2-3 eggs is laid in a scrape (i.e. a small shallow depression) and are cryptic in coloration, making them difficult to see. Both adults will incubate the nest for approximately 20-22 days. Once a nest has hatched, the adults will feed the semi-precocial chicks, which have left the nest, for 19-20 days until they fledge. The LETE has the shortest incubation and fledging periods of the shorebird species monitored at CAHA.

The common tern (COTE) is larger than the LETE. It is gray and white with a black cap, reddish-orange legs, and a reddish-orange bill. COTEs will incubate for 21-27 days. The chicks typically fledge between 26-27 days. Gull-billed terns (GBTE) are similar in size and coloration to the COTE, with the exception being the black legs and thick, black, blunt bill. Nests are incubated for 22-23 days and chicks will fledge in 28-35 days.

The black skimmer (BLSK) is a medium to large black and white waterbird. The bill is orange and black with the lower mandible extending past the upper mandible. The bird gained its name by its feeding habit of skimming over the water looking for prey. They are active more at dusk and dawn than during the day. Incubation of 3-5 eggs lasts 21-23 days. The semi-precocial chicks are ready to fledge within 23-25 days.

Monitoring of colonial waterbirds at CAHA focuses on identifying nesting habitat, protecting nesting areas and chicks, and performing routine nest, chick, and fledgling counts. This report contains a summary of the management techniques used, monitoring results for the 2009 breeding season, and comparisons to results from previous years.

METHODS

Consent Decree

In October 2007, a lawsuit was brought against the NPS by the Defenders of Wildlife and the National Audubon Society for failure to provide adequate protection of threatened and endangered species and species of concern from the impacts of off-road vehicle (ORV) use at CAHA. On April 30, 2008, a settlement to the lawsuit was reached between all parties and Federal District Court Judge Terrence Boyle signed a consent decree (CD). The purpose of the CD was to provide additional protection measures pending the development of an ORV management plan and special regulation. Examples of changes in management as a result of the CD included earlier dates for the establishment of pre-nesting closures and larger buffer requirements for nesting birds and chicks. The CD will be in effect until the ORV Management Plan and special regulation are finalized.

Closures

In addition to the pre-nesting closures for piping plovers (PIPL) that are described in the 2010 PIPL annual report, closures for colonial waterbirds were installed in areas where breeding behavior, scrapes, nests, or chicks were observed. This included areas of the seashore where pre-nesting closures had not been established. As per the CD, LETEs required a 100 meter buffer for breeding behavior, scrapes and nests and a 200 meter buffer for chicks (Table 1). Other protected colonial waterbird species required a 200 meter buffer for all breeding and nesting activity. Closures were modified as the colonies expanded or nests hatched to maintain the required buffer sizes from the outer most nest or chicks in the colony. When multiple species were present, the greatest applicable buffer distance was used.

Table 1. Colonial Waterbird Nesting and Chick Buffers Required by the 2008 CD.

Species	Breeding Behavior/Nest Buffer (m)	Unfledged Chick Buffer (m)
LETE	100	200
Other Protected Colonial Waterbirds	200	200

Monitoring

CAHA is broken into three resources management operational districts: Bodie/Hatteras, Hatteras, and Ocracoke. Each district had a team of biological technicians responsible for monitoring the species in that area. The Bodie/Hatteras District covered the area from Ramp 1 to Oregon Inlet,

which includes Bodie Spit, and Rodanthe to Ramp 30. The Bodie/Hatteras District also included Green Island, a small, semi-vegetated island on the sound-side of Oregon Inlet. Hatteras District is the largest of the three districts and extends from Ramp 30 south to Hatteras Inlet and includes Cape Point, South Beach, and Hatteras Inlet Spit. The Ocracoke District covers the area from Hatteras Inlet to South Point at Ocracoke Inlet.

Technicians were responsible for locating areas where colonies were forming. This involved observing terns for courtship, copulation, and scraping behaviors. When such behavior was observed and closure approval was received, a closure was installed around the area utilizing the required buffer. Once a closure was established, the area was surveyed at least once daily from outside the closure by resource management field staff. The distance from the outer most nests/chicks to the closure boundary was checked to ensure all nests or chicks were within the required buffer. If a nest or /chick was outside of the buffer, the closure was modified to meet the buffer requirements. Once nests began to hatch, closures were modified to meet the required 200 meter distance.

This year, in an attempt to count birds nesting later in the season, colonies were surveyed the second and third week of June rather than the last week of May and first week of June. Unless there was breeding behavior from another species the colony was not entered in to again.

Predator Control

In a pilot project to control canid, raccoon, and opossum predation on nests and chicks at the Bodie Spit Bait Pond colony, a 5-strand electric fence was installed around the historic location of the colony on April 29th -30th and was operational on the 30th. The fence was removed after all the chicks in the colony had fledged.

RESULTS

Nest Observations

The nesting population of colonial waterbirds was determined by taking a nest count during a walk through survey between June 5 and June 20. Results for each district are presented below.

Bodie/Hatteras District

Five colonial waterbirds colonies formed in the Bodie/Hatteras District during the 2010 nesting season (Table 2 and Appendix A; Maps 1-2). These colonies accounted for 30 percent of the LETE nest totals, 67 percent of COTE nests, and 1 percent of BLSK nests for CAHA. In addition to the nests, 28 LETE chicks and one COTE chick (Green Island) were documented during the walk through surveys (Table 2).

Hatteras District

Three colonial waterbird colonies formed in the Hatteras District (Table 2 and Appendix A: Maps 3-4). These colonies produced 56 percent of the nests. A single pair of GBTEs nested on the beach in the colony just to the east of Salt Pond Ramp. This was the first pair of GBTEs documented nesting on the Seashore since at least 2004. The nest was unsuccessful. For the fourth straight year, there were no BLSK nests on Hatteras Island. There were also no COTE nests documented in this district in 2010. In addition to the documented nests, 77 live and two dead LETE chicks were documented during the walk through surveys.

Ocracoke

Two colonial waterbirds colonies formed on Ocracoke (Table 2 Appendix A; Map 5) this year. These colonies produced 14 percent of the LETE nests, 33 percent of the COTE nests and 99 percent of the BLSK nests reported. In addition to the nests, 13 live LETE chicks were documented during the walk through surveys.

Table 2. Peak Nest Counts at Cape Hatteras for 2010.

2010 Colonial Waterbird Nests/Chicks							Outside survey window	
	Location	Survey Date	LETE	GBTE	BLSK	COTE	Survey Date	BLSK nests
Bodie / Hatteras District	GIC01	6/12/2010				14/1		
	BIC01	6/11/2010	42/4				8/9/2010	1
	BHC01	6/10/2010	15/2					0
	BHC02	6/10/2010	48/12					0
	BHC03	6/10/2010	8/10					0
Hatteras District	HIC01	6/7/2010	94/20					0
	HIC02	6/10/2010	50/30 ¹					0
	HIC03	6/10/2010	69/27	1				0
Ocracoke District	OIC01	6/17/2010	2/2					
	OIC02	6/18/2010	53/11		5/0	7/0	7/4/2010	11 ²
Total			381/118	1/0	5/0	21/1	Total	12
¹ Two additional dead chicks were observed during survey ² The five nests from the previous survey are included in this total.								

Nest Counts

The Seashore changed their survey dates to coincide with other colonial waterbird surveys being conducted along the Atlantic coast for the same species. In 2009 surveys were conducted at the Seashore during the last week of May and the first week of June and in 2010 the survey window was changed to June 5-June 20. The change in survey dates from the previous year led to a potential under-estimate of nests for the Seashore as 118 chicks were observed during the surveys. It was not possible to determine the nests of origin for the mobile chicks. To be more consistent with how other parks conduct their surveys and to minimize disturbance to the colonies, only one walk through of the colony was conducted during survey window time frame.

The total number of nests appears to be down in 2010 compared to 2009 even though protection of the colonies was similar between the two years. One possible explanation for the high nest numbers in 2009 is that early season storm events forced the birds to abandon their first nesting attempts on the off-shore islands and they nested in larger numbers on the Seashore. With no early season storms in 2010, the nesting numbers on the Seashore declined.

Table 3. CWB Nest Count Comparisons from 2007 to 2010.

Year	LETE	COTE	BLSK	GBTE
2007	194	109	11	0
2008	232	19	4	0
2009	577	53	61	0
2010	381(118) ¹	21(1)	12	1
¹ Totals in () represent documented chicks				

Productivity

CAHA tested a new methodology on several LETE colonies to see if it could be used to determine productivity in 2010. The methods required staff to do dusk shoreline fledgling counts for each colony as the birds grouped up in the evenings during what was believed to be the peak fledging period. Due to the length of the colonies, staff could not count all fledglings before it was too dark to complete the survey. While it is certain some colonies fledged chicks, there are no definite numbers for colonial waterbird productivity for 2010.

Nest/Chick Loss

Three factors are thought to have contributed to the loss of nests or chicks: predation, weather, and abandonment. On multiple occasions, more than one factor may have occurred. In 2010 staff did not take specific measures to document every nest or chick loss. However, it is known the lone GBTE nest was lost to a raccoon near the time it should have hatched. An over-wash event on May 26th was also responsible for nest losses on South Ocracoke.

Human Disturbance/Closure Intrusions

In determining the cause of loss of nests or chicks, human disturbance was considered as the primary cause if/only if direct observation or documentable evidence could support that conclusion. Any unobserved, potential or assumed effects of human disturbance were therefore not included in the recording of violations and potential causes.

A violation was any human act (intentional or unintentional) that could cause disturbance to the birds nesting inside resource protection areas. A violation was considered deliberate when the violation resulted in the destruction or damage of resource property (signs, sign poles or string) delineating a closure, or damage to eggs or chicks was documented. Examples of violations include pedestrians walking through the closure, ORVs running over resource protection signs, dogs off leash inside a resource closure, and kite-boarders/surfers landing inside the closure.

Closure Intrusions

Closure Intrusions were violations of resource closures that did not involve damage to resource property or damage to eggs or chicks. Intrusions were reported by resource field staff when footprints, tracks, or people were observed inside of the resource protection closures. Most intrusions were not witnessed. The total number of recorded intrusions is conservative as colony sites were not continuously monitored by staff and wind can obscure or reduce the likelihood of finding tracks. The number of intrusions documented for colonial waterbird colony closures are presented below (Table 4).

Table 4. CWB Closure Intrusions Recorded by Field Staff for 2010.

District	Intrusion Type			
	Pedestrian	Dog	ORV	Other*
Bodie/Hatteras	134	15	3	3
Hatteras	62	1	0	0
Ocracoke	35	2	1	2
Total	231	18	4	5
* - includes boats, horses, etc.				

Deliberate Violations

Those violations that result in the destruction of resource protection signs and/or string and flagging and/or the loss of nests or chicks are considered deliberate violations. The CD defined a confirmed deliberate violation as “an act that disturbs or harasses wildlife or vandalizes fencing, nests, or plants”. Deliberate violations of the established pre-nesting areas and buffers, as determined by NPS staff, were required to be automatically expanded by 50 meters. The second and third deliberate violations required an automatic expansion of 100 and 500 meters, respectively.

There were two deliberate pedestrian and one deliberate ORV violation involving pre-nesting closures in which CWBs nested in 2010.

Electric Fence

The results of this pilot project were inconclusive and the Park will probably try to replicate this study for at least one more year. There was evidence on a few occasions where coyote and fox tracks led us to believe they had received a shock. There were also two known instances where a fox and opossum were able to breach the fence.

LETE were the only colonial waterbirds to nest on Bodie Spit in the area of the electric fence this year. Black skimmers and common terns were observed in the area early in the season; however, they apparently nested on Pea Island and Green Island this year. The electric fence is not believed to have deterred any nesting attempts. The high density of predator tracks and high predation suffered during the 2009 breeding season is a more likely explanation for the lower nesting numbers in this colony in 2010.

Discussion

While the number of nesting LETEs appears to be trending upward, it is difficult to attribute this increase with certainty to any single known factor. A number of factors may have contributed to this. The first is, based on the last state-wide survey in 2007, the LETE population is increasing in the state and it is a safe assumption that CAHA is the beneficiary of immigrants from other colonies in the state. The other three species, GBTE, COTE and BLSK populations have had no discernable increases on the seashore. In 2010 there was an unsuccessful nesting attempt by a GBTE and successful nests from BLSK and COTE, but no fledglings were observed for these three species. Second, timely installation of closures and increased buffers may influence on the number of LETE pairs, or other colonial waterbird pairs, nesting at CAHA. As with previous years, the majority of colonies occurred outside of the existing PIPL pre-nesting closures. Third, weather events may influence when and where the birds nest in any given year. Fourth, predation may affect whether or not a colony returns to nest in the same location. Finally, the level of effort

in surveying the colonial waterbird nesting populations on the seashore has not remained the same over time. The Seashore is moving away from conducting frequent colonial waterbird nest counts just for reporting purposes and is attempting to minimize disturbance to the colonies. Although higher nesting numbers may have been attained by more frequent walk-throughs as in previous years, the potential negative impacts to the colony are too great and after discussing the issue with the North Carolina Wildlife Resource Commission and U.S. Fish and Wildlife Service, CAHA has decided to scale back on the intensive walk-through counts to a single walk-through per season.

APPENDICES

APPENDIX A: MAPS

Map 1: Bodie Island & Green Island Colonial Waterbird Colonies 2009

Map 2: Bodie Hatteras Colonial Waterbird Colonies 2009

Map 3: North Hatteras Colonial Waterbird Colonies 2009

Map 4: South Hatteras Colonial Waterbird Colonies 2009

Map 5: Ocracoke Hatteras Colonial Waterbird Colonies 2009