

Cape Hatteras National Seashore 2008 Colonial Waterbird Breeding Summary

Colonial waterbirds in the Cape Hatteras National Seashore (CAHA) established 18 different areas of breeding activity during the 2008 breeding season. Least terns, common terns and black skimmers all made nesting attempts although least terns were by far the most numerous. Data for the colonies was collected by walking transects through the colony and making a tally of nests, the number of eggs in each nest, and the number and approximate age of chicks that were found. These surveys were performed at least once per week and were usually completed by two to five Biological Science Technicians (bio-techs). Fledgling counts were made by scanning the colony with a telescope. This was often done by more than one bio-tech at a time to obtain more accurate data and lessen the chances of missing nests. Only data obtained during the peak nesting period (last week of May and first week of June), peak hatching period (21 days after the peak nesting period), to the peak fledging period (19-20 days after peak hatching), were used to estimate nesting numbers and to roughly estimate colony productivity (Appendix A).

As a result of the Consent Decree, any areas where colonial waterbirds exhibited breeding behaviors such as courtship or scraping were immediately closed to the public. One hundred meter buffers were established around least tern scrapes and nests and 200 meter buffers were established for other species. The closures were expanded as the colonies grew in size to maintain the buffer distance from the outermost nest in the colony. These buffers, in most cases, resulted in the area around the nesting colony being closed from the primary dune to the surf zone, allowing no through travel either by pedestrians or off-road vehicles. When least tern chicks were discovered within a colony the buffer was extended to 200 meters between the unfledged offspring and areas that were open to the public.

Breeding activity occurred between the beginning of May and the middle of August. Many of the colonies were established in areas utilized by colonial waterbirds in previous nesting seasons. Four out of the seven piping plover pre-nesting closures that were established in the spring of 2008 had at least one colonial waterbird colony develop within them. These were: Bodie Island spit, Cape Point, South Beach and Ocracoke's South Point. Hatteras Overwash Fans, Hatteras Inlet and the North Ocracoke Spit were pre-nesting closures that did not have colonial waterbird activity.

The following paragraphs are summaries of the eighteen different areas of colonial waterbird activity in CAHA.

Bodie Island District (Ramp 1 to Bodie Island Spit)

Bodie Island Colony #1

BIC1 was located on sand flats of the Bodie Island spit 1 mile south of Ramp 4.

This colony was comprised of more than 40 least tern pairs and four common tern pairs. More than 50 scrapes were found on May 8, and the buffer was expanded in accordance with the Consent Decree. On May 10, the first four nests were found within the buffer zone. The peak nest count was taken during a walk-through on the May 21, when 23 one-egg least tern nests and

four common tern nests were found. It is probable that no chicks were fledged from this colony, primarily due to predation by red and/or grey fox. Fox tracks were found in the colony throughout the breeding season and could still be found there as of September 2008. The colony was determined to be finished on July 13.

Green Island Colony

Green Island is a small partially-vegetated island on the sound side of Oregon Inlet. As in past years, the nesting colony was established on the north end of the island. The estimated population of this colony was more than six black skimmer pairs and more than 30 common tern pairs. The first breeding activity was noted on May 10, when five black skimmer scrapes were found. On May 17, five one-egg common tern nests were found, these were the first nests discovered within this colony. The peak nest count was taken on June 13 when five black skimmer nests and 26 common tern nests were discovered. There were no chicks or fledglings ever documented at this colony. The nesting area showed no evidence of over-washing at any time which suggests predation and/or abandonment as the likely cause of the colony's failure. Raccoon and otter tracks were noted during several surveys. The colony was determined to be finished on August 1.

Bodie-Hatteras District (Between Ramps 23 and 30)

Bodie-Hatteras Colony #1

The north boundary of BHC1 was 1.8 miles south of Ramp 23. The colony extended 0.2 of a mile further southward. The estimated population of this colony was more than 40 pairs of least terns. The first breeding activity was documented on May 8, when several scrapes were found in the area. The first five nests were found on May 24. The peak nest count was taken on June 3, when 39 nests were discovered; (7 one-egg, 28 two-egg, 4 three-egg). The peak fledgling count was taken on July 27, when 12 fledglings were seen roosting within the colony. This peak occurred 54 days after the nesting peak was documented which would suggest that there was a considerable amount of re-nesting within this colony.

Bodie-Hatteras Colony #2

The north boundary of BHC2 was 0.2 miles south of Ramp 27 and extended 0.3 miles further southward. The estimated population of this colony was more than 55 pairs of least terns. The first breeding activity was documented on May 8, when several scrapes were found in the area. The first nests were documented on May 13, when 12 two-egg nests and 11 one-egg nests were discovered. The nesting peak occurred on June 19, when 48 nests were discovered; (11 one-egg, 35 two-egg, and 2 three-egg nests). The peak fledgling count was taken on July 27, when 36 fledglings were seen within the colony. The colony was determined to be finished on August 17.

Bodie-Hatteras Colony #3

BHC3 was located roughly 0.7 miles north of Ramp 30. Territorial behavior, (mobbing of a breeding American oystercatcher pair) was witnessed on May 8. The colony consisted of 20 to 25 individual least terns. No scrapes or nests were ever found and as of June 5, all terns had left the area.

Bodie-Hatteras Colony #4

BHC4 extended from Ramp 27 southward 0.2 miles. This was a satellite colony of BHC2 containing roughly six pairs of least terns. The first breeding activity was documented May 13, when two nests and 12 scrapes were found. The peak nest count was taken soon after, on June 7, when five nests were found (two one-egg, three two-egg). Six chicks were seen on July 2. However, less than a week later there were no chicks or nests found at the site. No evidence of chicks fledging from this colony was documented. BHC4 was determined to be finished on July 15.

Bodie-Hatteras Colony #5

BHC5 began 0.1 miles north of Ramp 27 and extended northward for 0.2 miles. The estimated population of this colony was greater than five pairs of least terns. The first breeding behavior was documented on May 19, when two scrapes were found in the area. This was the last documented account of least tern activity in the area. The closure was removed on June 4.

Bodie-Hatteras Colony #6

BHC6 was located one mile north of Ramp 27 and extended for another 0.1 miles northward. This is a location that has not been utilized by least terns in the last three years. The estimated population of this colony was greater than 40 pairs of least terns. The first breeding behavior was documented on May 27, when a scrape was found in the area. Four days later two nests were found. The peak nest count was taken on June 10, when 15 adults were observed in incubating posture. The peak fledgling count was taken on July 27, when 19 fledglings were seen in the area. There were no chicks seen after August 6, and the closure was removed on August 18.

Hatteras District (Ramp 30 south to Hatteras Inlet)

Hatteras Island Colony #1

HIC1 was located 0.9 miles west of Ramp 45 and extended westward for another eight tenths of a mile. The area used for nesting was roughly fifty acres. The estimated population of this colony was greater than eighty pairs of least terns. The first breeding activity was discovered on May 8, when scrapes were found 1.7 miles west of Ramp 45. On May 14, two nests were discovered on the eastern side of the existing closure. The area eastward of the colony was closed to ORV traffic because of AMOY closures installed near Ramp 45. The colony exhibited a trend of eastward expansion while the western boundary remained stationary throughout the breeding season. The peak nest count was taken on June 4 when 63 nests were documented (20 one-egg, 43 two-egg nests), 23 chicks ranging between one and seven days of age were also found on this survey. The peak fledgling count was taken on July 17 when 22 fledglings were counted while walking through the colony. In early August there were still a few unfledged chicks toward the eastern edge of the colony. However, by the middle of August all territorial behavior had ceased and on August 16 the colony was determined to be finished.

Hatteras Island Colony #2

HIC2 was located on the eastern edge of the Cape Point pre-nesting closure 0.6 miles south of Ramp 44. This colony had an estimated population of greater than 40 least terns utilizing an area of 1.5 acres. The first breeding behavior was documented on May 3, when least terns were seen

making scrapes within 10 feet of the closure boundary. The protection buffer was then extended to 100 meters thus restricting through access of off-road vehicles to Cape Point. On May 11, the first six least tern nests were found in the area and it was noted that common terns were seen using the area as well. On May 14, the colony was over-washed by elevated tides resulting from an offshore storm. No Colonial waterbird breeding behavior was seen in the area after the storm event.

Hatteras Island Colony #3

The northern boundary of HIC3 was located 0.5 miles north of Ramp 34 and extended southward 0.4 miles. This was extended another 0.1 miles on June 16, due to a scrape found less than 30 meters from the southern end of the closure, and was extended another 0.6 miles south on July 11, when 22 least tern chicks were observed outside of the existing closure. The estimated population of this colony was greater than 60 pairs of least terns and one pair of common terns utilizing 23 acres. The first breeding behavior was documented on May 5, when many scrapes were found along the backshore north of Ramp 34. The first nest was found in the northern portion of the closure on May 10. The peak nest count was taken on June 16, when 49 least tern nests were documented (8 one-egg, 36 two-egg, and 5 three-egg nests). The peak fledgling count occurred on July 23, when 61 fledglings were counted during a survey. The last least tern chick was seen on August 10 and the closure was removed on August 18. It is important to note that this colony underwent regular predation by feral cats. Nearly every time a walking survey was completed it was noted that cat tracks were seen meandering throughout the colony.

Hatteras Island Colony #4

HIC4 extended from 0.2 miles west of Ramp 45 eastward to Salt Pond Road and covered an area of 23 acres. This colony had an estimated population of greater than 15 least tern pairs. The first breeding behavior that was documented occurred on May 8, when 40 scrapes and a one-egg nest were found around a small island of vegetation where Ramp 45 met the foreshore. The peak nest count was taken on June 18, when 15 least tern nests (2 one-egg and 13 two-egg) were documented. Twelve of these nests were found amongst small dunelets on the west side of Ramp 45 while only one nest was found on the east side of the ramp. The peak fledgling count was taken on July 28, when five fledglings were seen in the area. As of August 1, the colony had concluded except for one brood that had moved eastward to the vicinity of Salt Pond Road. These two chicks were last seen on August 6, and were presumed to be predated on or before August 10.

Hatteras Island Colony #5

HIC5 was located 0.4 miles east of Salt Pond Road and extended eastward to the Salt Pond drainage mouth covering 18 acres. This colony had an estimated population of greater than 30 least tern pairs and three common tern pairs. The first breeding behavior was documented on May 9, when least tern scrapes were found. The peak nest count was taken on June 5, when 28 least terns and two common terns were seen in incubating posture during an observation. Ten days later there were only two least tern nests and no common tern nests in the colony. Raccoon tracks were found throughout the colony in abundance and all of the nests lost were assumed to be predated over the previous few days. Some of the colony did re-nest. The peak fledgling count was taken on July 28, when nine fledglings were seen within the colony. As of August 1, the activity in the colony had ceased except for a single one-egg nest that was located roughly

100 meters southeast of the main colony. This nest was last seen on August 6 and was presumed abandoned or predated on or by August 10.

Hatteras Island Colony #6

HIC6 was located 1.3 miles southwest of Ramp 55 and covered roughly 0.2 acre. This area was inside of an existing AMOY nesting closure. The only time that breeding behavior was documented in this area was on May 26, when more than ten least tern scrapes were found and territorial behavior by about 12 terns was observed. This was the last time that least terns were seen in this location. The colony was determined to be finished when a survey was performed a week later.

Ocracoke Island District (Hatteras Inlet south to Ocracoke Inlet)

Ocracoke Island Colony #1

OIC1 was a very loose colony of least terns that were found scraping 0.9 miles south of Ramp 68 on May 15. This was the last documentation of least terns being observed in this area and the colony was determined to be finished on May 26.

Ocracoke Island Colony #2-A

OIC2-A was located one mile southwest of Ramp 72 between the primary dune and the ocean, and covered roughly 62 acres. OIC2-A was the primary tern colony on South Point and consisted of more than 45 least tern pairs and two common tern pairs. The first breeding behavior was seen on May 17 when both least terns and common terns were seen exhibiting territorial behavior and scraping in the area. Five days later, on May 22, 16 least tern nests were found. The peak nest count was taken on June 14, when 43 least terns were seen in incubating posture during observations. No fledglings were ever observed in this area. This was an area of frequented by greater black-backed gulls and herring gulls and it is assumed that these species were responsible for the lack of fledging success in this colony. OIC2-A was determined to be finished on August 4.

Ocracoke Island Colony #2-B

OIC2-B was a satellite colony of OIC2-A located 1.7 miles southwest of Ramp 72 in the central sand flats of South Point spit. This colony covered 2.5 acres and consisted of two nests. The first breeding behavior was documented when a single nest was found on May 31. The following week, on June 6, the nest was observed again, having a clutch of two eggs. On June 22, two chicks were seen at the nest site. On July 4, a one-egg nest and one chick were observed. Two days later, on the July 6, a storm over-washed the site. Least tern activity was not seen in the colony following the storm and the colony was assumed to be finished. No other nests were observed, but on August 4, (one month later) a least tern chick was seen in the area. The chick was not seen after August 8 and the closure was removed.

Ocracoke Island Colony #2-C

OIC2-C was located on the sand spit hook of Ocracoke South Point 2.2 miles southwest of Ramp 72. This colony had a population of more than 20 least terns and covered 7.5 acres. The first breeding behavior was observed on June 1, when a one-egg nest and several scrapes were found along a dry section of the hook. The peak nest count was taken on June 15, when six nests were

found (1 one-egg, 3 two-egg, and 2 three-egg). The peak fledgling count was taken on July 10, when four fledglings were observed. The colony was over-washed as result of a storm on August 3. No territorial behavior was witnessed after this and the colony was determined to be finished on August 5. This colony was over-washed more than once and it is assumed that productivity would have been higher if the colony would have nested more than a few inches above the high-tide line.

Conclusions

When compared to the 2007 data, this year's colonial waterbird data shows an increase in least tern productivity and a decrease in the productivity of common tern, gull-billed tern, and black skimmers. The least tern population was estimated to be nearly twice the size of the population in 2007. There an increase 70 least tern nests documented in 2008 than in 2007. Also, the number of least tern chicks that fledged (as estimated during the fledgling period) increased by an additional 61 fledglings. A detailed chart of each colony's totals can be found in Appendix A.

The apparent increase in productivity could be attributed to several different factors. The first factor that may have led to the increase in least tern productivity was the increased buffers resulting from the enactment of the Consent Decree. During this year's shorebird breeding season there were large sections of beach near waterbird colonies that were closed to ORVs and pedestrians. This decrease in disturbance may have encouraged the growth and expansion of several colonies long after their initial establishment. Examples of this were documented at the beaches between Ramps 23 and 27, Ramp 34, and South Beach (Ramp 45 to Ramp 49). In each of these areas colonies expanded a great deal during the nesting season.

A second factor that may have increased the number and success of least terns was the change in prerequisite for the establishment of buffers at CAHA. This season, in accordance with the Consent Decree, buffers were established based on breeding behaviors such as territorial activity, scraping, and courtship rather than the presence of nests alone as in previous seasons. Setting up a protective buffer during the scraping process may have allowed some colonies to form and produce fledglings while in previous years the area may have been abandoned before nests were ever laid if disturbance occurred while the birds were setting up in the area (e.g. Ramp 45 colony). The increased buffers may have decreased area abandonment by some colonies.

The third factor that may have led to an increase in productivity is the removal of mammalian predators throughout the CAHA with a focus on removal near known nesting areas. It is assumed by the Resource Management staff that the leading cause of nest and brood failure is predation. The predator removal efforts deflated populations of raccoons, opossums, feral cats, red and grey fox, and mink which are all known predators of waterbird colonies. This is the first year that the CAHA has had a well-developed trapping program. By reducing the populations of mammalian predators, we may already be seeing a small increase in shorebird productivity. However, raccoon at the Cape Point colony and mink at South Ocracoke colonies decimated those breeding attempts.

A final important factor to recognize when comparing the 2008 breeding season to previous seasons is that more emphasis was placed on collecting colonial waterbird data. Due to staffing levels in 2008 it was possible to spend more time monitoring the waterbird colonies. Colonies could be surveyed on foot at least once a week by small groups of bio-techs which produced relatively reliable nest and chick counts. In previous years (including 2007) colonies were rarely walked through and were usually surveyed by one bio-tech telescoping the colony of birds. Because of the differences in survey techniques it is difficult to accurately compare this year's data with previous year's data.

Note: Fledgling totals for 2007 and 2008 in the following charts assume no migration in or out of the colonies. The totals only include fledglings observed during the calculated peak. Late season fledglings observed after the peak were not included in the totals below since late season fledglings could not be differentiated from earlier fledging chicks.

Appendix A.

District #	Location	Population/ Species	Peak Nest Count	Fledgling estimates
Green Island	North End	>12 BLSK, >50 COTE	5 BLSK, 26 COTE	0
Bodie Island 1	Bodie Island Spit	>80 LETE, >8 COTE	23 LETE, 4 COTE	0- fox predation
Bodie/Hatteras 1	1.8m S of Ramp 23	>80 LETE	39 LETE	12 LETE
Bodie/Hatteras 2	0.3m S of Ramp 27	>100 LETE	48 LETE	36 LETE
Bodie/Hatteras 3	0.7m N of Ramp 30	20-25 LETE	0	0
Bodie/Hatteras 4	0.1m S of Ramp 27	>10 LETE	5 LETE	0
Bodie/Hatteras 5	0.1m N of Ramp 27	>10 LETE	0	0
Bodie/Hatteras 6	0.9m N of Ramp 27	>40 LETE	15 LETE	19 LETE
Hatteras 1	1.5m W of Ramp 45	>130 LETE	63 LETE	22 LETE
Hatteras 2	East Cape Pt	> 40 LETE	5 LETE	0-storm overwash
Hatteras 3	Ramp 34	>100 LETE, 2 COTE	49 LETE	61 LETE
Hatteras 4	Ramp 45	>30 LETE	15 LETE	5 LETE
Hatteras 5	Center of Cape Pt	>50 LETE, >6COTE	21 LETE, 3 COTE	6 LETE
Ocracoke 1	South of Ramp 68	<10 LETE	0	0
Ocracoke 2-A	E. of main dune	>90 LETE	43 LETE	0-GBBG predation
Ocracoke 2-B	Central sand flats	2 LETE	1 LETE	0-storm overwash
Ocracoke 2-C	SW South Pt hook	>40 LETE	6 LETE	4 LETE
	2008 Totals:	>844 LETE, > 66 COTE, > 12 BLSK	333 LETE, 33 COTE, 5 BLSK	165 LETE
	2007 Totals:	>466 LETE, >20 COTE, >12 BLSK	263 LETE, 91 COTE, 16 BLSK	104 LETE, 1 COTE

2008 compared to 2007

Least Terns: +378 individuals estimated
 +70 nests
 +61 fledged chicks (rough estimate)

Common Terns: -46 individuals estimated
 -17 nests
 - 1 fledged chicks

Black Skimmers: no estimated population change
 -11 nests
 no estimated change in fledged chicks