

**CAPE HATTERAS NATIONAL SEASHORE
COLONIAL WATERBIRD MONITORING
2013 ANNUAL REPORT**



National Park Service
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ABSTRACT

In 2013, colonial waterbird (CWB) monitoring at Cape Hatteras National Seashore (CAHA) consisted of identifying and protecting active colonies as well as conducting at least two walk-through nest surveys during peak nesting. The nesting population of CWB was determined by taking a nest count during walk-through surveys in the first part of June for tern species or later in June for other species. A total of 19 active colonies were documented in 2013. Green Island contained one colony, Bodie Island contained two colonies, Hatteras Island contained 13 colonies and Ocracoke Island contained three colonies (Appendix A, Maps 1-6). Of these active colonies, 12 met the requirements of a colony (i.e. 10 or more nests) as defined in the Cape Hatteras National Seashore Off-Road Vehicle Management Plan (ORVMP). The total number of nests for least terns (LETE), common terns (COTE), black skimmers (BLSK), and gull-billed terns (GBTE) decreased in 2013. The Forster's tern (FOTE), a species previously undocumented to be nesting at CAHA, was discovered nesting on Green Island among COTE and BLSK. In 2013, totals of 802 LETE nests, 34 COTE nests, 119 BLSK nests, 6 GBTE nests, and 42 FOTE nests were documented. The largest multi-species colony occurred on Green Island and consisted of 30 COTE nests, 42 FOTE nests, and 53 BLSK nests. The largest LETE colony, 329 nests, occurred at Cape Point on Hatteras Island.

INTRODUCTION

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 CWB. 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*), and black skimmer (*Rhynchops niger*). Less common nesters include the gull-billed tern (*Gelochelidon nilotica aranea*) and Forster's tern (*Sterna forsteri*).

ORV Management Plan

On February 15, 2012 the Cape Hatteras National Seashore Off-Road Vehicle Management Plan and Special Regulation (2012, ORVMP) was enacted at CAHA. It was developed from 2007-2012 and was accompanied by a special regulation detailing requirements for off-road vehicle (ORV) use at CAHA. A copy of the ORVMP and other related documents are available electronically at <http://parkplanning.nps.gov/caha>. The ORVMP includes establishment of pre-nesting closures and buffer requirements for nesting birds and chicks as well as the requirement for an ORV permit to drive on CAHA beaches. It states that "Concentrations of more than 10 CWB nests in more than one of the past five years and new habitat that is particularly suitable for shorebird nesting...will be posted as pre-nesting closures...by April 15." This was the second year the ORVMP guided the management of protected species at CAHA.

METHODS

Closure

In addition to the pre-nesting closures established for Piping Plovers (PIPL) and American oystercatchers (AMOY), pre-nesting closures for CWB were installed by April 15, 2013 in areas where the habitat was suitable for nesting and where nesting had occurred in more than one of the past five years (Appendix A, Maps 1-6). This included areas where pre-nesting closures had not been established for PIPLs and/or AMOYs earlier in the breeding season. As per

the Final ORVMP, LETE buffers were 100 meters for breeding behavior (scrapes or nests) and 200 meters for unfledged chicks. Other protected CWB species received a 200 meter buffer for all breeding and nesting activity (Table 1). 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 applied.

Table 1. CWB Nesting and Chick Buffers.

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

Monitoring

Monitoring of CWB at CAHA focuses on identifying nesting habitat, protecting nesting areas and chicks, and monitoring colony activity. Technicians were responsible for locating areas where active colonies were beginning to form. This involved observing CWB for courtship, copulation, and scraping behaviors. Colony establishment began when scraping behavior or physical scrapes were observed and a closure (with applicable buffers) was installed around the area. Once a closure was established, the area was observed at least once daily from either outside the closure or inside the closure at the shoreline by resource management field staff. Efforts were made to minimize entry into colonies to minimize colony disturbance.

A minimum of two walk-through nest-abundance surveys were performed for each colony to more accurately count and classify colony types. The highest count was reported as the nesting peak. The estimated peak nesting for CAHA is generally within the first week of June, but this may be advanced or delayed based on the start date and progression of the colony. If chicks have been observed prior to the first week of June then it is acceptable to perform a walk-through survey. The distance from the outer most nests/chicks to the closure boundary were checked during observation periods to ensure all nests or chicks were within the required buffer.

Predator Control

Depredation by mammals has the potential to affect the success of a colony, thus predator control continues to be a tool in aiding with the success of established colonies. Traps were installed in the vicinity of the closure(s) with the intent of targeting specific predators. When field staff walked through areas, they documented and reported any natural signs of predators e.g. track or scat. If predator sign was found in a closure, trapping efforts were increased in that location.

The electric fence project at CAHA was not implemented for the 2013 CWB breeding season. After three consecutive years of use on Bodie Island spit, it was decided that given the dynamic nature of the spit, the electric fence could not consistently or effectively remain operable. The project may be revisited in the future if alternative modifications can be made to prevent excessive weathering of the fence.

RESULTS

Observed Colonies

The ORVMP does not specify what parameters constitute an active CWB colony. Based on current resource management protocols, an active colony that triggers a resource protection closure must include physical evidence of established breeding such as a scrape or a nest; behavior alone (e.g. copulation or fish-flashing) will not suffice. A total of 19 colonies (Table 2) active with scrapes or nests were observed within CAHA during the 2013 breeding season. If not already present, a closure with proper buffering was installed to provide the colony with protection. Under the ORVMP, locations of colonies containing more than 10 CWB nests will be considered for future placement of prenesting closures.

Table 2. Summary of Colonies Observed During the 2013 Breeding Season.

	Observed Colonies	Colonies With More Than 10 Nests
Green Island	1	1
Bodie Island	2	2
Hatteras Island	13	6
Ocracoke Island	3	3
Total	19	12

Scrape/Nest Observations and Counts

Similar to previous years, individual colony walk-throughs occurred during the peak nesting period for each species. The 2013 breeding season deviates from 2012 in that walk-throughs were conducted a minimum of two times during peak nesting and potentially a third time if circumstances necessitate. A third survey was likely if a colony start date is early or delayed, if there is predator influence, if storms/weather significantly impact colony sites, or if the colony has grown and more accurate information regarding breeding estimates can be obtained.

Peak nest counts produced a total of 802 LETE nests with 81 observed chicks, 34 COTE nests with 1 observed chick, 6 GBTE nests, 119 BLSK nests with 19 observed chicks, and 42 FOTE nests with 11 chicks. All but 4 colonies were surveyed within the June window. Colony BHCO08 had a late start date of June 13, 2013, which delayed the survey window into early July. The same follows for colonies HICO04, HICO05, and OICO03 which had even later start dates that pushed the surveys into mid-July. The colony on Green Island (GICO01) was observed on average once per week by way of kayak. For the first time, multiple FOTE were documented nesting on the island among COTE and BLSK. At this point, it is uncertain whether this species had nested on Green Island previously and was misidentified as a COTE, or if this is the initial nesting year for this species on the island. Bodie Island spit was absent of nesting COTE and BLSK in 2013. This unusual occurrence is attributed to the changed landscape of the spit after Hurricane Sandy in the fall of 2012. The hurricane flattened the profile of the spit by removing the dunelettes and elevated parcels of sand preferred by COTE and BLSK.

Four LETE colonies were established and abandoned before the walk-through survey dates:

- Colony BHCO01 on Hatteras Island was active (scrapes only) from May 10 – May 19. One day after the establishment of this colony, there was a drastic reduction in LETE. On May 12, abundant fox tracks were observed within the colony. Thereafter, the presence of LETE was minimal and eventually non-existent.
- Colony BHCO03 on Hatteras Island was active with scraping and one pair in incubating posture from May 14 – May 27. This particular site directly south of Salvo is generally productive in terms of nesting but a rapid reduction in LETE activity occurred nonetheless.
- Colony BHCO05 on Hatteras Island was active (scrapes only) from May 15 – May 23. On the same day the colony was established, an ORV drove directly through the colony site minutes before a resource protection closure could be installed. The following day and henceforth, LETE breeding activity dwindled and eventually ceased.
- Colony BHCO07 on Hatteras Island was active (scrapes only) from May 16 – May 22. The LETE breeding activity within this colony was in the early stages when a feral cat was removed from the area on May 17. Minimal activity was observed thereafter.

Historical Comparison

With the exception of the newly documented FOTE nests on Green Island, the total number nests for all species in CAHA were lower in 2013 (Figures 1-4). The total LETE nests, although lower, were not much different from the previous nesting season and still fall very much above the average number of nests. The number of documented LETE chicks, 81, is the second highest among the last five years. The COTE and BLSK nest numbers both saw a decrease which may be attributed to the dynamic habitat change that the points and spits endured during last fall's Hurricane Sandy. The BLSK nest numbers still remain much higher than average and 2013 saw the highest documented chick count (19 chicks) for this species in five years. Nesting GBTE may have also fallen victim to the habitat-transforming hurricane, but their nest numbers were not much lower than average at CAHA.

Figure 1. Historic LETE Peak Nest Counts.

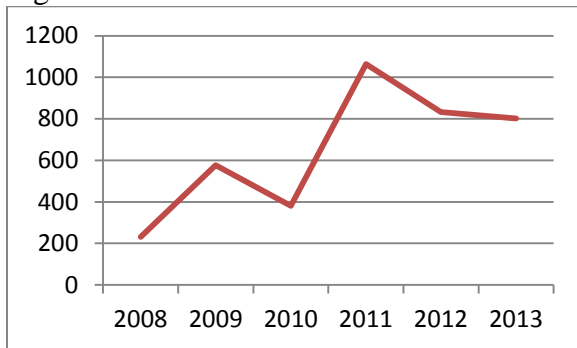


Figure 2. Historic COTE Peak Nest Counts.

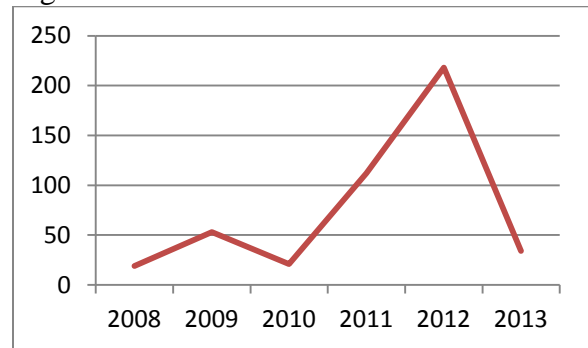


Figure 3. Historic GBTE Peak Nest Counts.

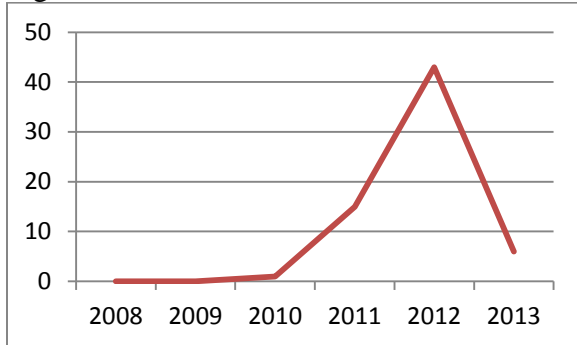
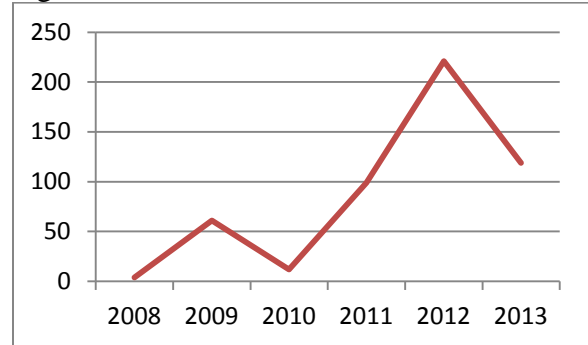


Figure 3. Historic BLSK Peak Nest Counts.



Productivity

Productivity in unmarked CWB colonies is very difficult to determine. While it is certain many colonies fledged chicks, there are no definitive numbers for CWB productivity at CAHA. Of the 19 documented colonies, LETE fledglings were observed in eleven colonies, COTE fledglings were observed in one colony, and BLSK fledglings were observed in one colony. GBTE or FOTE fledglings were not observed.

Nest/Chick Loss

Three factors at CAHA are thought to contribute to the loss of nests or chicks on a yearly basis: depredation, weather, and abandonment. On multiple occasions, more than one factor may have occurred. In six of the 19 colonies, depredation of eggs and/or chicks was documented. Predators included ghost crabs, avian predators, raccoon, mink, feral cat, red fox and coyote. Nests located in closer proximity to water were more subject to being washed out than nests located on higher elevations on the beach. Some nesting locations, primarily on the points and spits, were more prone to being washed out after Hurricane Sandy scoured the habitat and eroded much of the smaller dunes and vegetation in 2012.

Human Disturbance

Human disturbance, direct or indirect, can lead to the abandonment of nests or loss of chicks. Throughout the 2013 season, field staff documented 78 pedestrian, five ORV, and four dog, boat or horse intrusions in closures with CWB. The numbers are conservative since sites are not monitored continuously, weather erases tracks, and field staff did not disturb an incubating pair or young in order to document disturbance. These numbers indicate violations to closures specifically containing nesting CWB or habitat protected for CWB. It is important to note that most of the closures contained multiple species, including CWB, American oystercatchers, and piping plovers. Most illegal entries were not witnessed, but documented based on vehicle, pedestrian, or dog tracks left in the sand. Visitors' unleashed dogs are also a threat to protected species and continue to be a problem.

DISCUSSION

The 2013 CWB nesting season resulted in fewer documented nests in four of the five species that nest at CAHA. There are a few factors that may have played a role in this outcome. As is the norm, depredation will always be a factor that affects nesting shorebird colonies at CAHA. The more significant affecter may be the severe weather that plagued the outer banks before and during

the shorebird breeding season. When Hurricane Sandy wreaked havoc on our barrier islands the previous fall, it reduced the habitat to a flat and muddy plane, thus eliminating most of the small and sparsely vegetated duneettes that species like BLSK, COTE, and GBTE depend on for nesting. Fortunately, these areas were able to recover and restore nesting shellbed habitat in the backshore in time for breeding season, even though the points and spits still lack in profile. In the heart of nesting season a second culprit emerged, Tropical Storm Andrea plagued the outer banks in early June by bringing excessive winds and extreme tides resulting in many areas being washed out.

While severe weather and depredation may have contributed to lesser nesting numbers, the overall colony count (19) is higher than the previous year. The installation of pre-nest closures and maintenance of appropriate buffers may have had a positive influence on the number of CWB pairs nesting at CAHA by providing a sense of security within locations they utilize for nesting on a yearly basis. Of the 19 colonies, only two were comprised of multiple species while the rest had LETE as the common factor. Green Island nesting species included BLSK, COTE and FOTE while the colony on Ocracoke spit included LETE, BLSK, COTE, and GBTE. Last season, Cape Point saw its first multi-species colony since 2006 but this colony reverted back to LETE-only in 2013; another potential result of habitat alteration by weather.

Instead of one walk-through nest count survey as in 2012, a transition was made this season to a minimum of two walk-through nest-abundance surveys. These surveys were performed for each colony to aid in refining nest counts and to more accurately classify colony types; the survey having the highest count was reported as the nesting peak. Resource management staff has made a greater effort to quantify birds documented in incubating posture as an alternative to conducting more frequent walk-through counts outside of peak nesting. Although we are losing some accuracy by relying solely on observational skills, nesting shorebirds have benefited from less obtrusive methods of monitoring.

APPENDICES

APPENDIX A: MAPS

Map 1: Bodie Island & Green Island Colonial Waterbird Colonies 2008 - 2013

Map 2: Bodie Hatteras Colonial Waterbird Colonies 2008 - 2013

Map 3: North Hatteras Colonial Waterbird Colonies 2008 - 2013

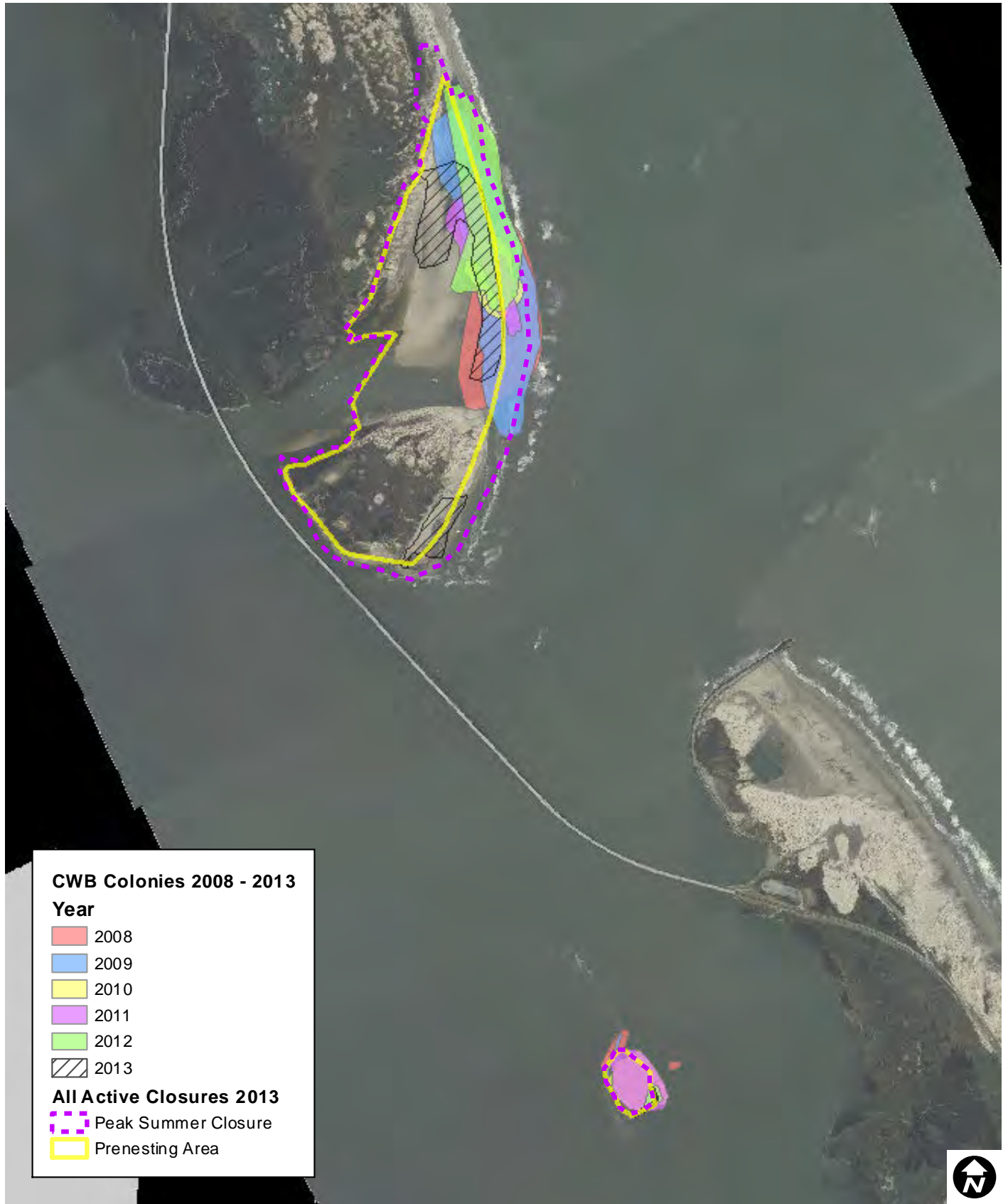
Map 4: Southeast Hatteras Colonial Waterbird Colonies 2008 - 2013

Map 5: North Ocracoke Colonial Waterbird Colonies 2008 - 2013

Map 6: South Ocracoke Colonial Waterbird Colonies 2008 - 2013



Map 1: Bodie Island & Green Island CWB Colonies, 2008 - 2013



CWB Colonies 2008 - 2013

Year

- 2008
- 2009
- 2010
- 2011
- 2012
- 2013

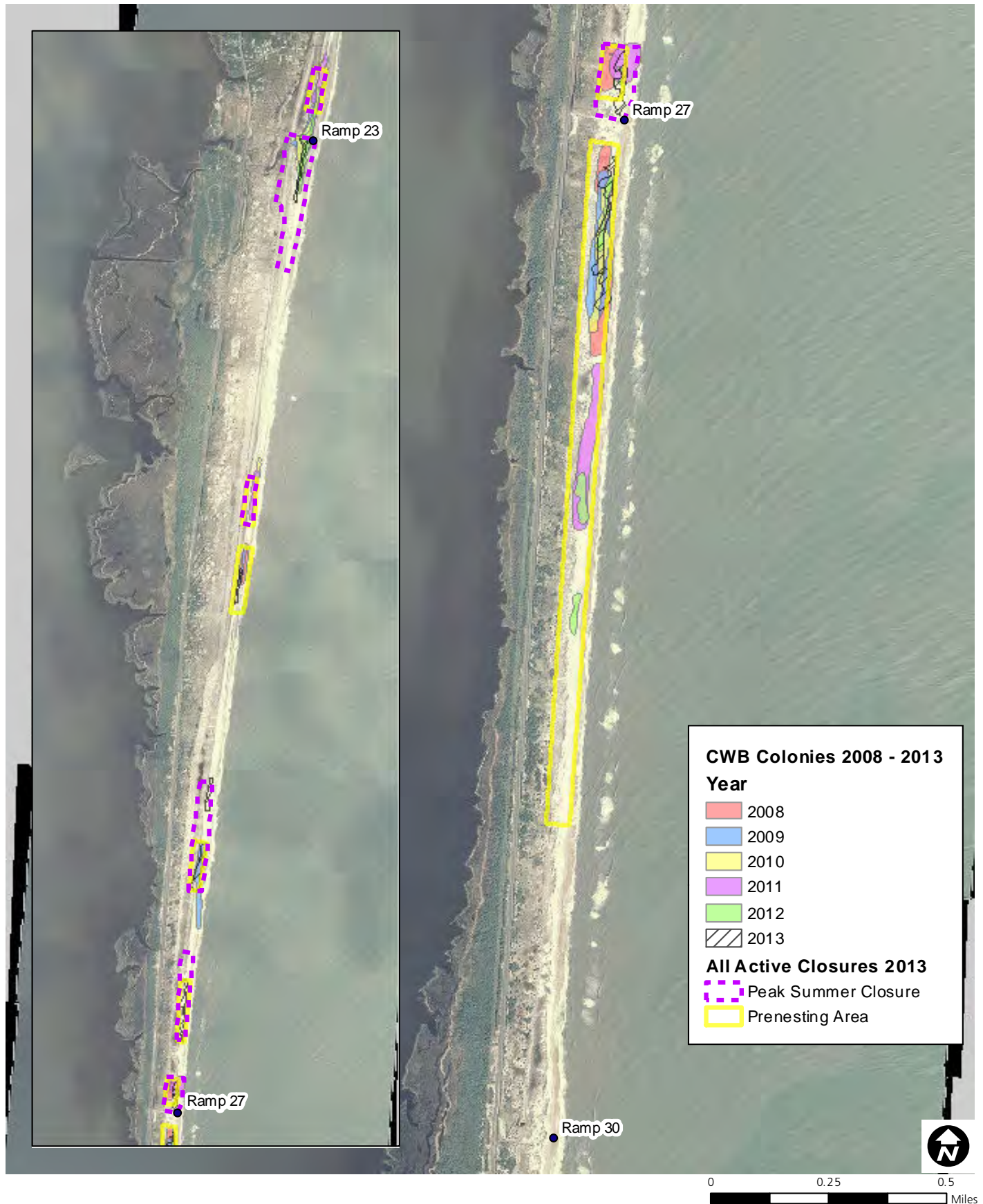
All Active Closures 2013

- Peak Summer Closure
- Prenesting Area

0 0.225 0.45
Miles

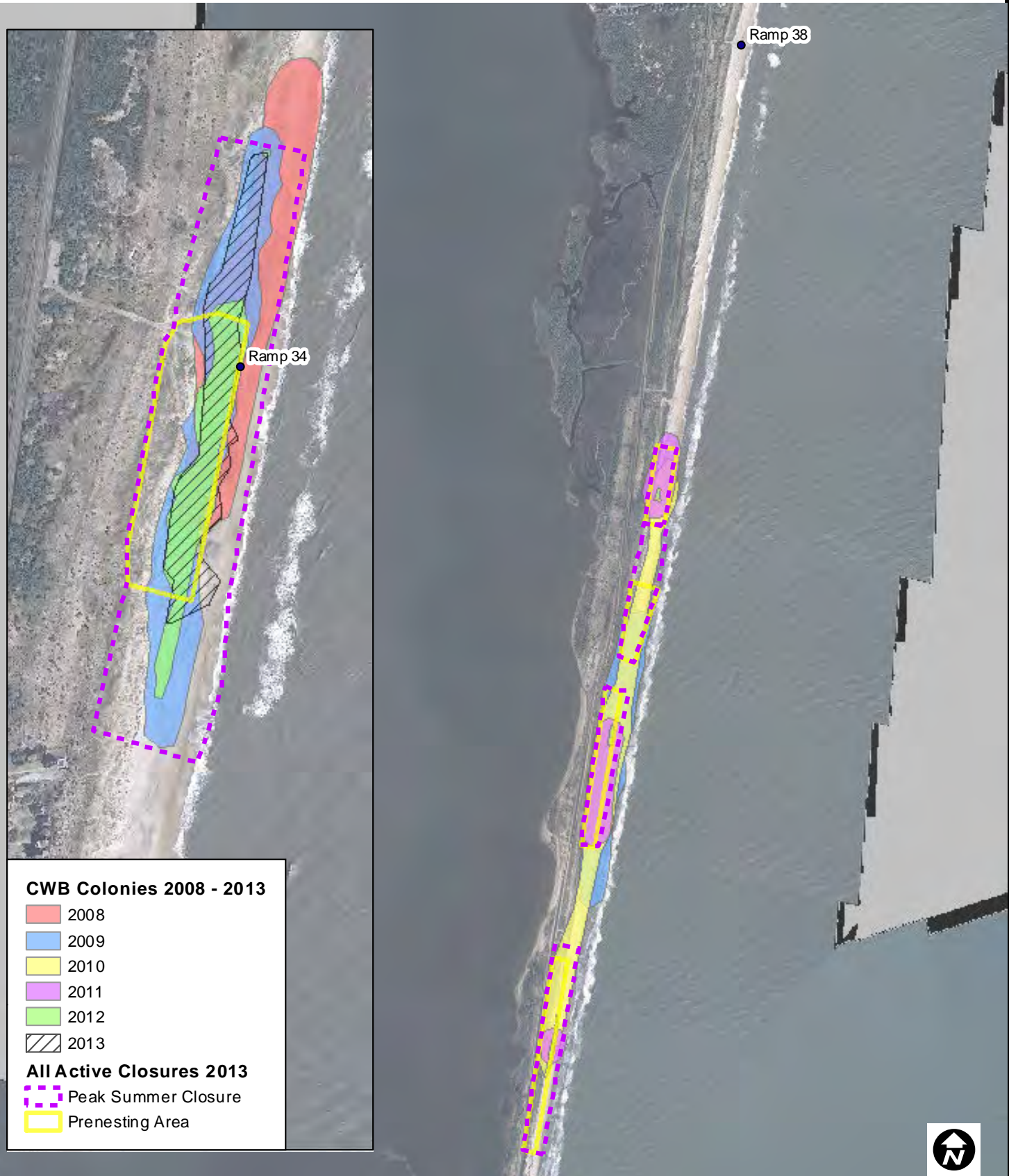


Map 2: Bodie Hatteras CWB Colonies, 2008 - 2013





Map 3: North Hatteras CWB Colonies, 2008 - 2013

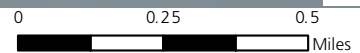


CWB Colonies 2008 - 2013

- 2008
- 2009
- 2010
- 2011
- 2012
- 2013

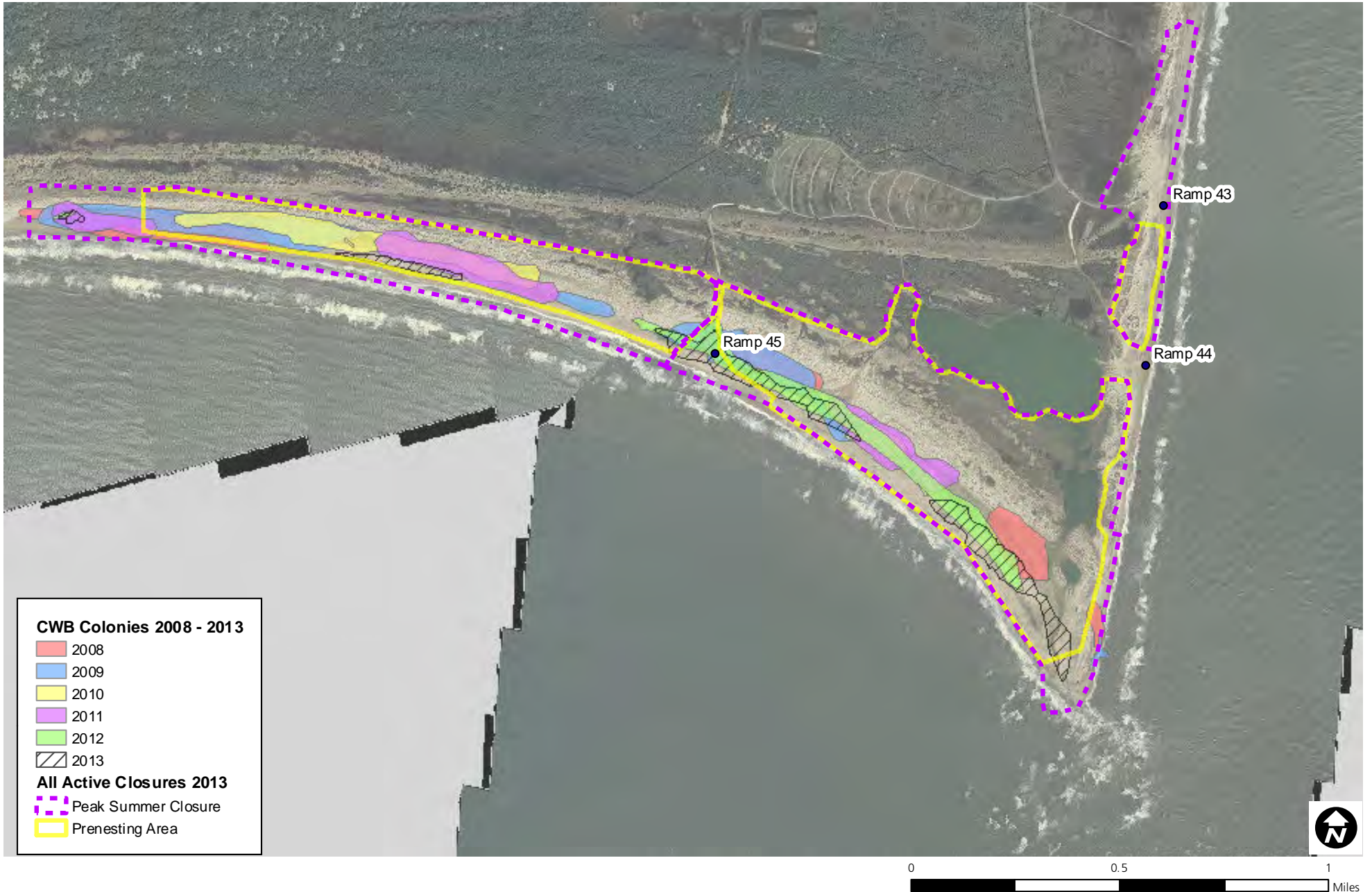
All Active Closures 2013

- Peak Summer Closure
- Prenesting Area





Map 4: Southeast Hatteras CWB Colonies, 2008 - 2013



CWB Colonies 2008 - 2013

- 2008
- 2009
- 2010
- 2011
- 2012
- 2013

All Active Closures 2013

- Peak Summer Closure
- Prenesting Area



Map 5: North Ocracoke CWB Colonies, 2008 - 2013





Map 6: South Ocracoke CWB Colonies, 2008 - 2013

