

**CAPE HATTERAS NATIONAL SEASHORE
COLONIAL WATERBIRD MONITORING
2014 ANNUAL REPORT**



National Park Service
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ABSTRACT

During the 2014 breeding season, 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 per colony during peak nesting. The nesting population of CWB was determined by documenting nests during walk-through surveys primarily during the month of June, but occasionally into July, depending on colony status. A total of 12 colonies containing two or more nests within 200m (as defined by the seashore's Colonial Waterbird Management protocol) were documented in 2014. Hatteras Island contained seven colonies, Bodie Island contained two colonies, Ocracoke Island contained two colonies, and Green Island contained one colony (Appendix A, Maps 1-6). Of these observed colonies, nine met the requirements of future pre-nesting closure placement (i.e. 10 or more nests) as defined in the Cape Hatteras National Seashore Off-Road Vehicle Management Plan (ORV Management Plan). The total number of nests for least terns (LETE), common terns (COTE), black skimmers (BLSK), and gull-billed terns (GBTE) saw an overall decrease during the 2014 breeding season. A decrease in nests for the isolated Forster's tern (FOTE) was also observed. The species was documented nesting on Green Island for a second consecutive year among COTE. In 2014, totals of 469 LETE nests, 38 COTE nests, 95 BLSK nests, one GBTE nests, and four FOTE nests were documented. The largest multi-species colony occurred on Ocracoke Island Spit (South Point) and consisted of 95 BLSK nests, 50 LETE nests, seven COTE nests, and one GBTE nest. The largest LETE colony, 144 nests, occurred at beach access Ramp 34 on Hatteras Island.

INTRODUCTION

Colonial waterbird 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. The beaches of CAHA provide 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 (*Rynchops niger*). Less common nesters include the gull-billed tern (*Gelochelidon nilotica*) and Forster's tern (*Sterna forsteri*).

Cape Hatteras National Seashore Off-Road Vehicle Management Plan and Special Regulation

On February 15, 2012 the Cape Hatteras National Seashore Off-Road Vehicle Management Plan and Special Regulation (ORV Management Plan) was enacted. 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 ORV Management Plan and other related documents are available electronically at <http://parkplanning.nps.gov/caha>. The ORV Management Plan 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 Apr 15." This is the third year the ORV Management Plan has guided the management of protected species at CAHA.

METHODS

Resource Protection Closures

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, 2014 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 PIPL and/or AMOY earlier in the breeding season. As per the Final ORV Management Plan, 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. Colonial waterbird (CWB) nesting and chick buffers at CAHA.

	Breeding Behavior and 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. In addition to established pre-nesting closures, technicians were responsible for locating additional areas where active colonies may begin to form. This involved observing CWB for courtship, copulation, and scraping behaviors. Initialization of data collection 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 determine the size of the colony. The highest count was reported as the nesting peak. The estimated peak nesting for CAHA is generally within the first part 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 or 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 and surveyed 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.

RESULTS

Observed Colonies

The ORV Management Plan does not specify what parameters constitute an active CWB colony. Based on the current protocol, Colonial Waterbird (CWB) Management at Cape Hatteras National Seashore, “Each distinct group of nesting CWB will be considered a colony and receive a name designation if there are 2 or more nests within 200m or less of one other.” Also, activity 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 12 colonies (Table 2) with 2 or more nests within 200m were observed within CAHA during the 2014 breeding season. If not already present, a closure with proper buffering was installed to provide the colony with protection. Under the ORV Management Plan, locations of colonies containing more than 10 CWB nests will be considered for future placement of pre-nesting closures.

Table 2. Summary of colonies observed during the 2014 breeding season.

	Observed Colonies	Colonies with More than 10 Nests
Bodie Island	2	1
Green Island	1	1
Hatteras Island	7	6
Ocracoke Island	2	1
Total	12	9

Nest Observations and Counts

Similar to previous years, individual colony walk-throughs occurred during the peak nesting period for each colony. The 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 was early or delayed, if there was predator influence, if storms/weather significantly impacted colony sites, or if the colony grew and more accurate information regarding breeding estimates was obtained.

Table 3. Total nests, eggs, and chicks documented per species during peak nesting surveys; 2014.

	Nests	Eggs	Chicks
LETE	469	922	134
COTE	38	89	2
GBTE	1	2	0
FOTE	4	9	0
BLSK	95	292	59

Peak nest counts produced a total of 469 LETE nests with 134 observed chicks, 38 COTE nests with two observed chicks, one GBTE nest, four FOTE nests, and 95 BLSK nests with 59 observed chicks. Of the 12 observed colonies, three of them contained multi-species nesters. On Ocracoke,

14CWBOI01 was the most diverse colony on the seashore, containing LETE, COTE, GBTE, and BLSK; the nearby 14CWBOI03 contained LETE and COTE. The colony on Green Island, 14CWBGI01, was reached by way of kayak but only under safe, weather-permitting conditions; it was monitored on 8 of 71 active days. For a second consecutive season, multiple FOTE were documented nesting on the island among COTE; conversely, BLSK did not nest on Green Island in 2014. Bodie Island and Hatteras Island only contained single-species colonies – all LETE.

Eight CWB breeding locations were established and lost before colony status could be established and prior to the walk-through survey dates.

- 14CWBBH01 on Hatteras Island was active (LETE scrapes only) from May 8 – May 15. The gradual reduction in LETE activity within one week was thought to be caused by a heavy pedestrian presence; this is typical with CWB that establish within the vicinity of Ramp 27 (north).
- 14CWBBH03 on Hatteras Island was active (LETE scrapes only) from May 11 – May 17. The close proximity to Ramp 27 (south) and a likely increase in human interaction is what may have caused this CWB congregation to abandon breeding activity early.
- 14CWBHI04 on Hatteras Island was active from May 11 – May 19. Minimal scraping activity was observed and on 5/17 an unusually high tide was documented near the breeding habitat. No nests documented.
- 14CWBOI02 on Ocracoke Island was active from May 25 – June 17. Breeding activity ceased for unknown reasons; only a maximum of 6 breeding adults documented. No storm and overwash event or predator interaction was observed.
- 14CWBBH05 on Hatteras Island was active from June 2 – June 25. Breeding activity ceased gradually for unknown reasons. Only one nest, and later 2 chicks, was observed but why the CWB never thrived is unclear.
- 14CWBHI07 on Hatteras Island was active from July 9 – July 22. Only scrapes were observed in this breeding location. Data suggests that the adults may have broken away from a larger colony that recently concluded breeding activity. Mostly fledglings observed.
- 14CWBHI08 on Hatteras Island was active from July 14 – August 5. Data suggests this was a shift in location from 14CWBHI07. Only a single nest was documented on multiple occasions and on 8/5-8/7 intense ocean swell from Hurricane Bertha (offshore) was thought to lead the end of breeding activity.
- 14CWBBH06 on Hatteras Island was active from July 17 – July 27. This is an unusually late start for any CWB breeding activity. Although one nest was located, the majority of the numerous CWB observed did not display breeding behavior at any time.

Historical Comparison

With the exception of a minimally higher COTE nest count, the total number of nests for the remaining species in CAHA were lower in 2014 (Figures 1-4). The FOTE nests, though not represented graphically due to a lack of history, were also lower. The number of documented LETE chicks, 134, is the highest to date. The congregation of BLSK that typically nest on Green Island was absent in 2014, which may be attributed to an increasing number of Laughing gulls (*Leucophaeus atricilla*) nesting on the island. The BLSK nest numbers fell just below the park average and 2014 saw the highest documented chick count (54 chicks) for this species in six years. The GBTE still remain low in terms of nesting numbers and they were only observed on Ocracoke for a second consecutive year.

Figure 1. Historic LETE Peak Nest Counts.

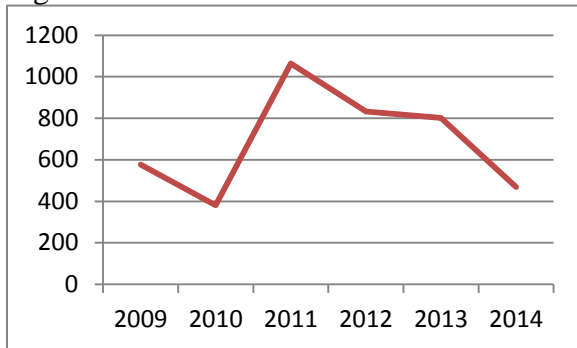


Figure 2. Historic COTE Peak Nest Counts.

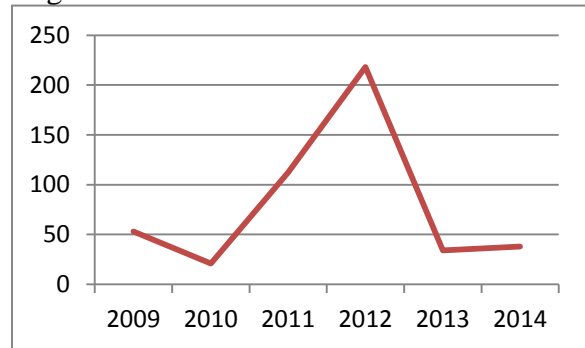


Figure 3. Historic GBTE Peak Nest Counts.

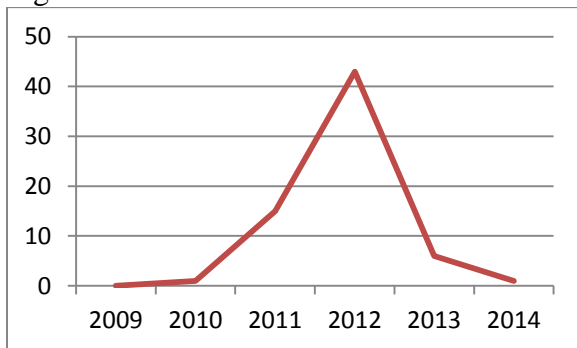
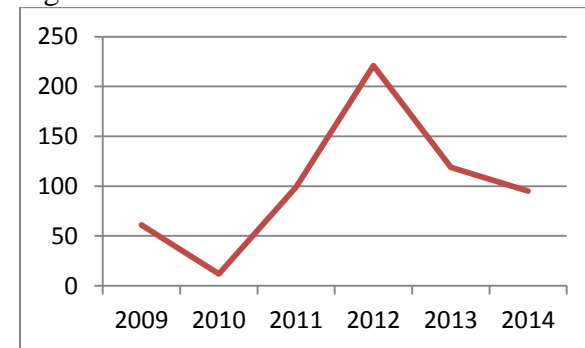


Figure 3. Historic BLSK Peak Nest Counts.



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 12 documented colonies, LETE fledglings were observed in 4 colonies. No other species of fledglings were observed.

Nest and Chick Loss

Three factors at CAHA are thought to contribute to the loss of nests or chicks on a yearly basis: predator disturbance, abandonment, and weather. On multiple occasions, more than one factor may occur. The heavy abundance of ghost crabs throughout the seashore is a continuous threat that all nesting CWB face. Large-predator interactions were documented in 4 of the 12 observed colonies; documented predators include coyote, avian predators (e.g. gulls), and feral cat. Perpetual predators that affect localized colonies include coyote disturbance on Bodie Island spit

and mink on Ocracoke Island. Constant pressure from predators has proven to lead to colony abandonment. North Carolina endured its earliest hurricane on record just after peak CWB nesting; Hurricane Arthur passed through the area on July 3-5. Nests and chicks located in closer proximity to water were more subject to being washed out than those located at higher elevations on the backshore beach; especially vulnerable were nests and chicks on the points and spits.

Human Disturbance

Human disturbance, direct or indirect, can lead to the abandonment of nests or loss of chicks. Throughout the 2014 nesting season, field staff documented 31 pedestrian and 3 Off-road Vehicle (ORV) intrusions within resource protection closures containing CWB. Dog violations were not documented within the vicinity of CWB nesting areas and one instance involved 3 pedestrians accessing Green Island by way of boat. Most unlawful entries were not witnessed, but documented based on pedestrian, vehicle, or dog tracks left in the sand. 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. This number, 31, indicates 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/or piping plovers. Visitors' unleashed dogs are continuously a threat to protected species attempting to nest on the beach.

DISCUSSION

The 2014 CWB nesting season resulted in fewer documented nests in four of the five species that nest at CAHA. Typically, pressure from predators will always be a factor that affects nesting shorebird colonies at CAHA. A more significant affecter may be the severe weather that surprised the outer banks during the shorebird breeding season. Fortunately, Hurricane Arthur passed over the area when the majority of the breeding had concluded. Interestingly, multiple CWB congregations (with scrapes) formed after the hurricane, potentially indicating that some breeding adults reattempted nesting after the storm. Ocracoke Island appeared to endure more extreme habitat alteration due to the hurricane, while Hatteras Island received moderate damage and Bodie Island showed minimal signs of erosion.

Even though seven fewer colonies were documented than the previous year, the overall decrease in nest numbers per species was not drastic. The installation of yearly 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 less human pressure within nesting habitat.

Two walk-through nest-abundance surveys were performed during peak breeding for a second consecutive year. These surveys were performed for each colony to aid in refining nest counts and to more accurately classify colonies; 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 CWB Colonies, 2009 - 2014

Map 2: Bodie Hatteras CWB Colonies, 2009 - 2014

Map 3: North Hatteras CWB Colonies, 2009 - 2014

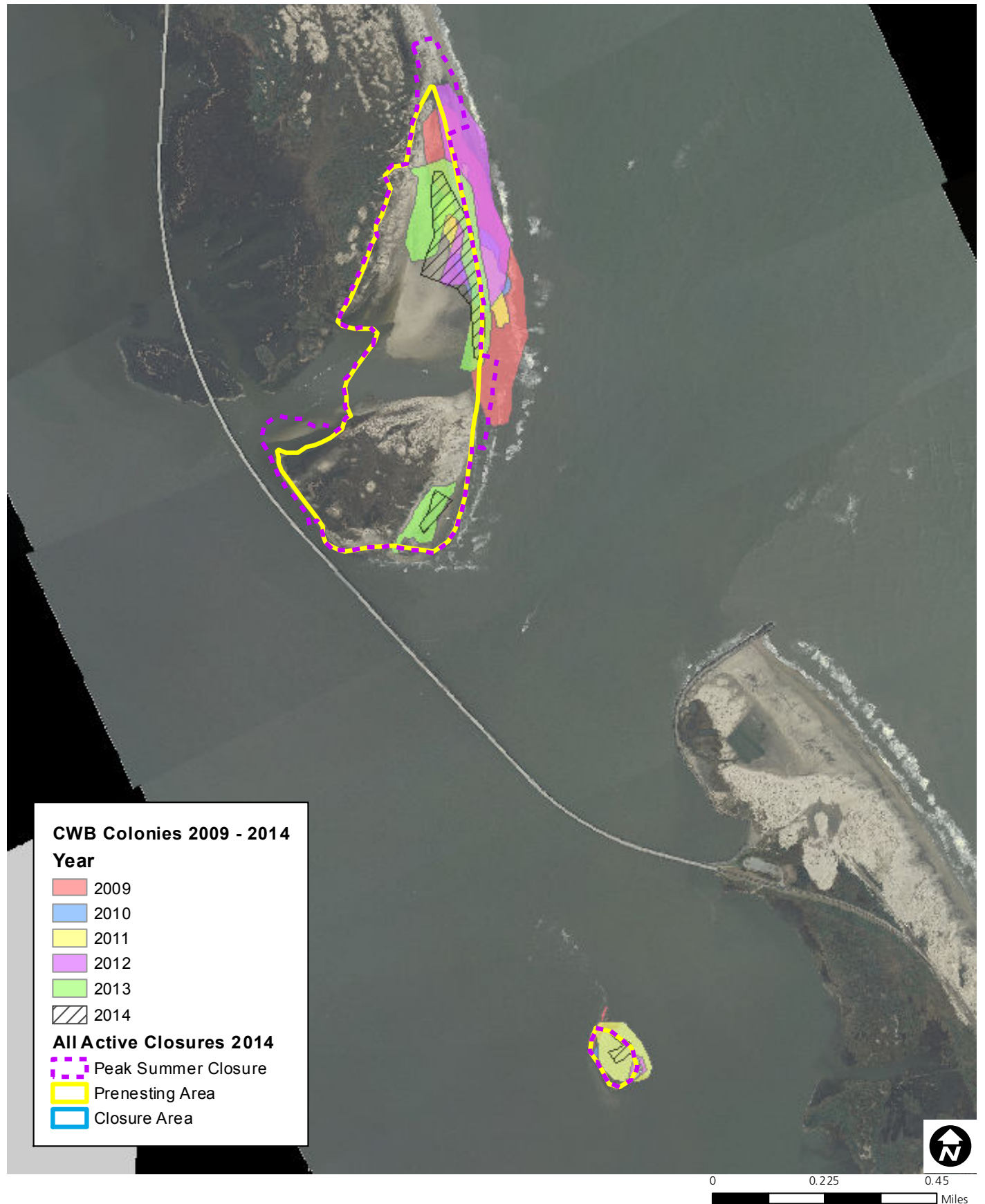
Map 4: Southeast Hatteras CWB Colonies, 2009 - 2014

Map 5: North Ocracoke CWB Colonies, 2009 - 2014

Map 6: South Ocracoke CWB Colonies, 2009 - 2014

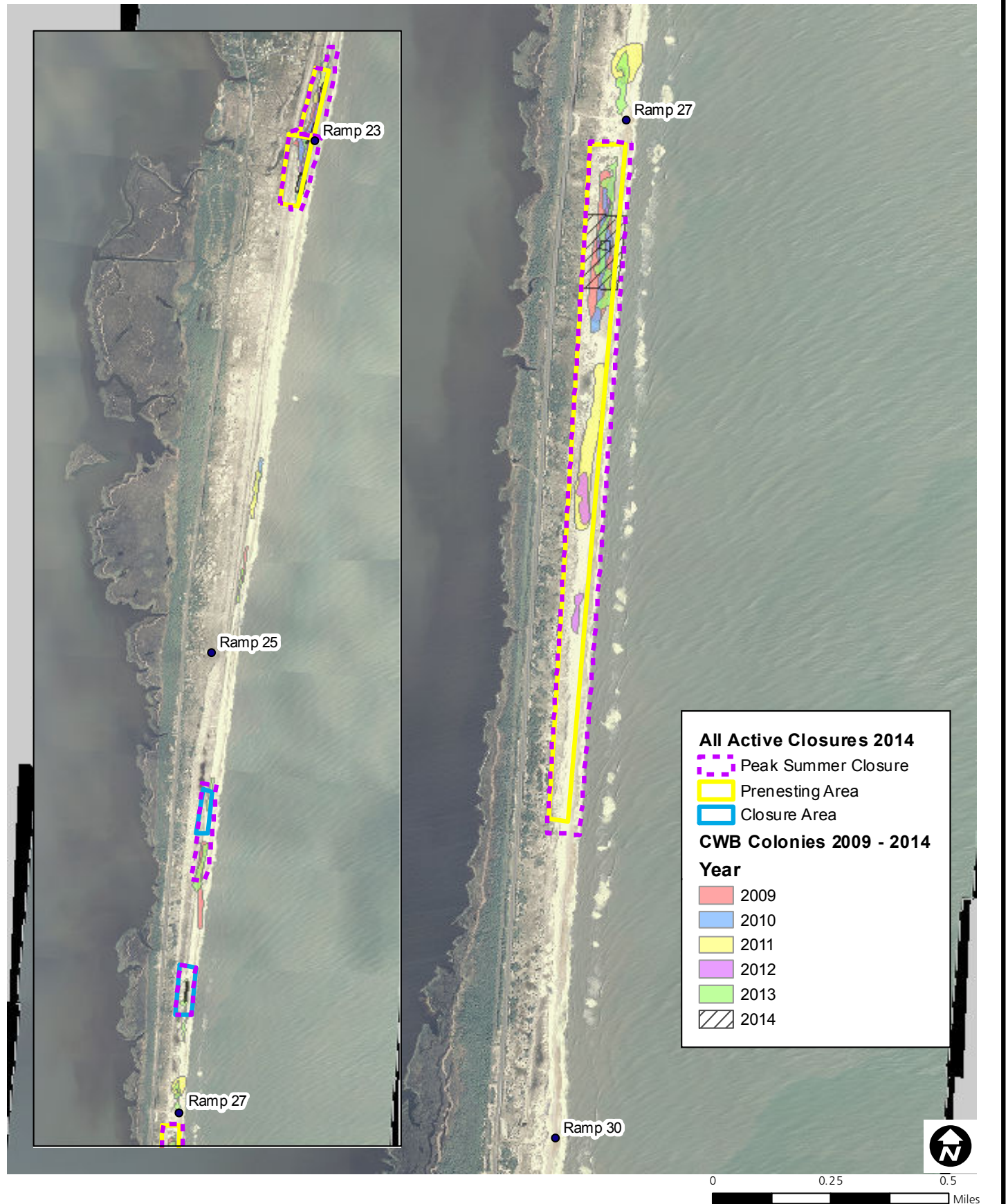


Map 1: Bodie Island & Green Island CWB Colonies, 2009 - 2014



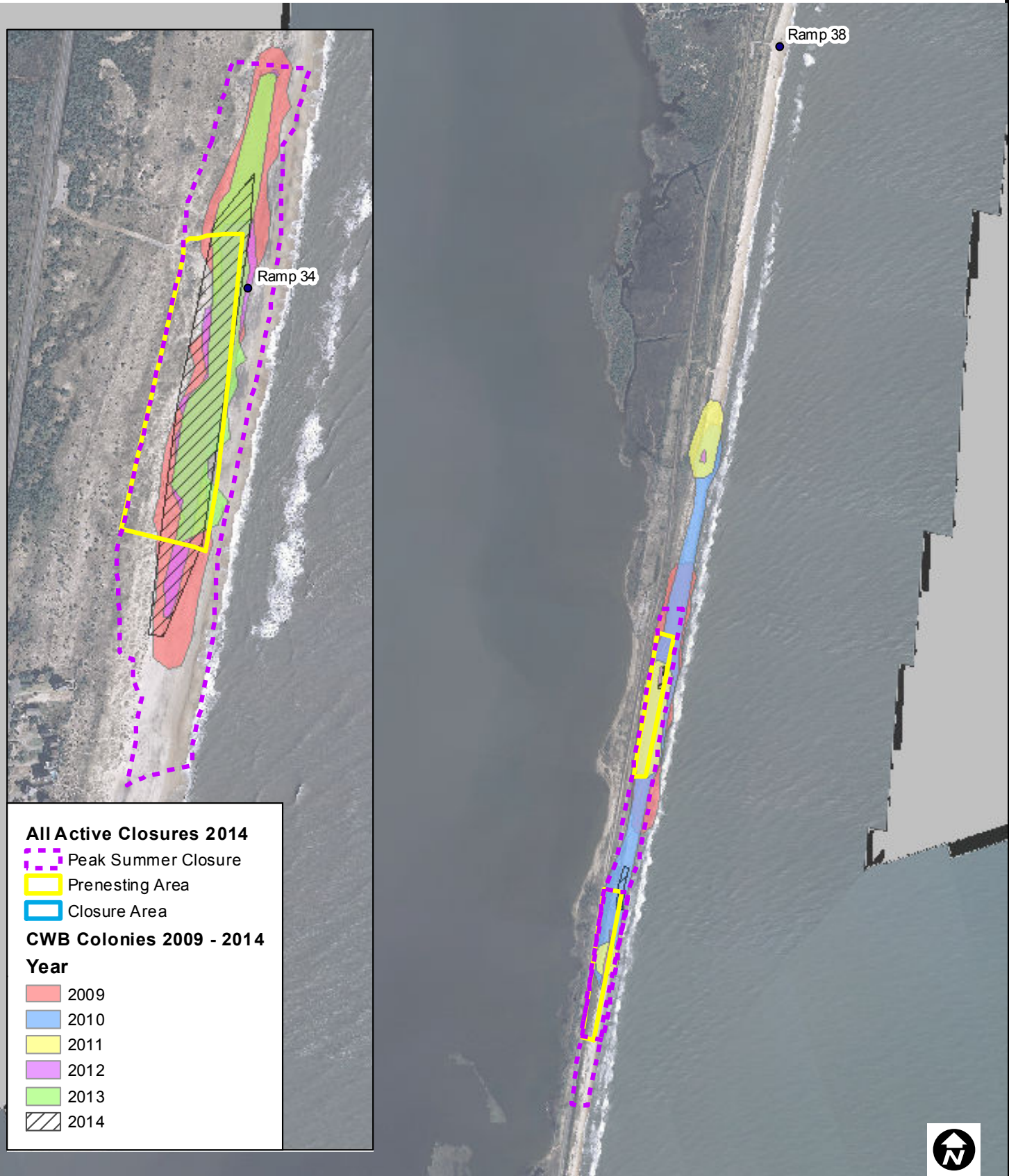


Map 2: Bodie Hatteras CWB Colonies, 2009 - 2014





Map 3: North Hatteras CWB Colonies, 2009 - 2014



All Active Closures 2014

- Peak Summer Closure
- Prenesting Area
- Closure Area

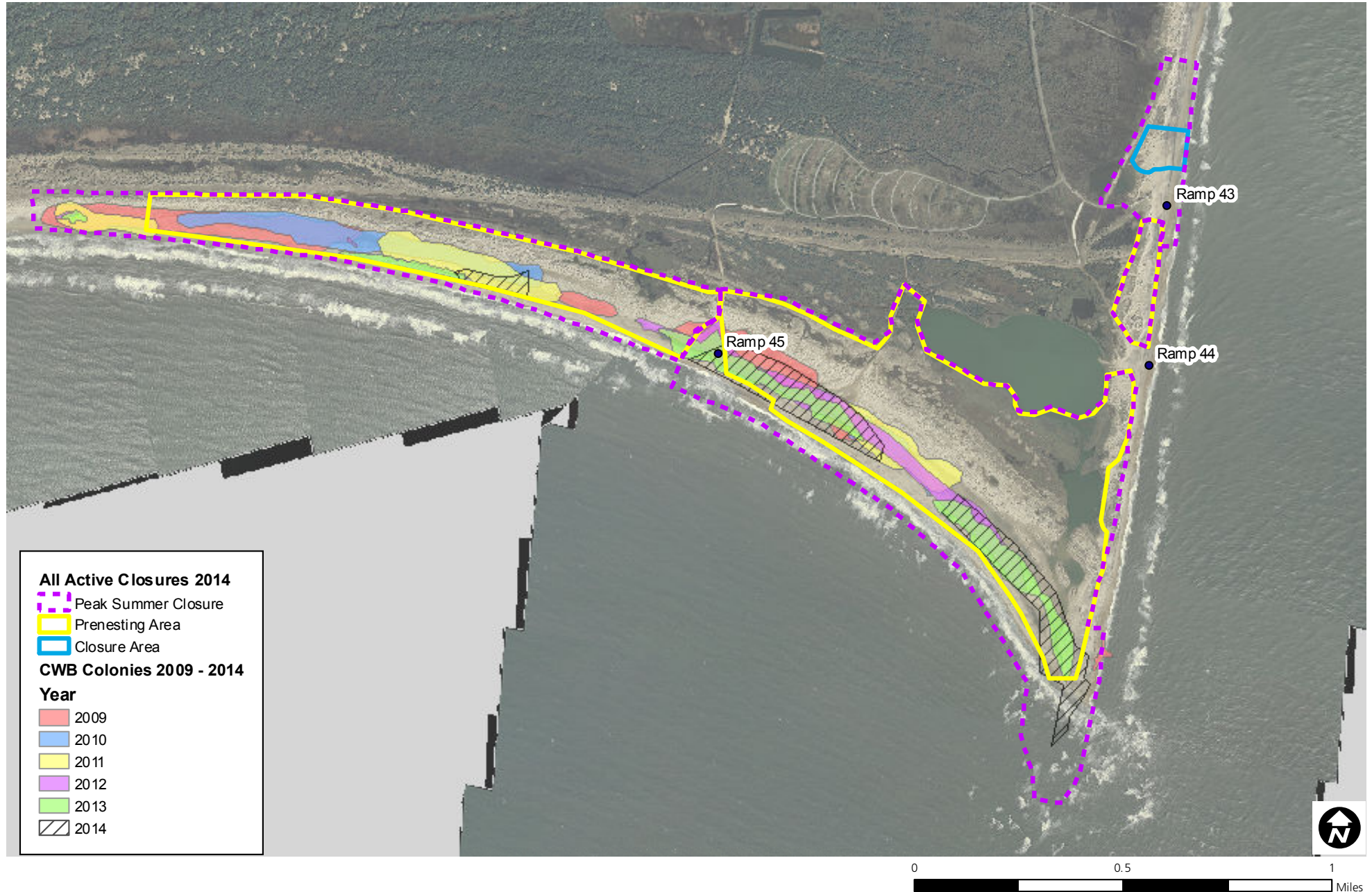
CWB Colonies 2009 - 2014

Year

- 2009
- 2010
- 2011
- 2012
- 2013
- 2014



Map 4: Southeast Hatteras CWB Colonies, 2009 - 2014



All Active Closures 2014

- Peak Summer Closure
- Prenesting Area
- Closure Area

CWB Colonies 2009 - 2014

Year

- 2009
- 2010
- 2011
- 2012
- 2013
- 2014



Map 5: North Ocracoke CWB Colonies, 2009 - 2014





Map 6: South Ocracoke CWB Colonies, 2009 - 2014

