

**2003 SEA TURTLE SUMMARY
BREEDING AND STRANDING ACTIVITIES
CAPE HATTERAS NATIONAL SEASHORE**

Introduction

Cape Hatteras National Seashore (CAHA) lies near the northern proximity of nesting sea turtles. Non-breeding sea turtles can be found in the nearby waters, especially inshore sounds, during much of the year. CAHA follows management guidelines defined by the North Carolina Wildlife Resources Commission (NCWRC) in *Handbook for Sea Turtle Volunteers in North Carolina* (2002). An annual permit is issued by NCWRC under the authority of the U.S. Fish and Wildlife Service.

Breeding Activity

Beaches were patrolled daily between June 1 and September 1, 2003 in search of turtle crawls. Volunteers In the Park, Student Conservation Association volunteers and Park staff monitored approximately 55 miles each day on Bodie, Hatteras and Ocracoke Islands.

Nest Composition and Distribution

There were 89 nests located in 2003 (Table 1). This is less than the record 101 nests found last year but higher than the average number recorded at CAHA (Chart 1) since 1988 when monitoring efforts improved. Efforts were not as thorough in early years, but over the past ten seasons an average of 78 nests per year have been found. Of the 89 nests found this season, 53 (59%) were found on Hatteras Island, 35 nests (39%) were found on Ocracoke Island and one nest was located on Bodie Island. Hatteras Island had 20 fewer recorded nests than last season, Ocracoke had 11 more, and Bodie Island decreased from four the previous year to one. Ocean temperatures were unseasonably cool along CAHA beaches this season. For example, the life guarded beach north of Cape Point often reported daily surf temperatures of 72 degrees F in July and August – four to six degrees cooler than normal. Seventy-five per cent of the nesting activity occurred along the south facing beaches where water temperatures were warmer than the east facing beaches north of Cape Point. The first known nest of the season was found on May 21 and the last nest was laid on August 21.

Three species of sea turtles were known to have nested on CAHA beaches in 2003. The species and distribution were 86 loggerhead nests (*Caretta caretta*), two green nests (*Chelonia mydas*), and one leatherback nest (*Dermochelys coriacea*). Green turtle nests were lost to storm activity and thus could not be examined for post-hatching confirmation. This is the tenth year green turtle nests were recorded at CAHA in the past 24 years. This figure is likely low due to inadequate documentation in early years. This is the fourth year a leatherback nest has been recorded here. Neighboring Pea Island Wildlife Refuge reported a total of two loggerhead nests this season, a low number, which may also have been the result of cooler water temperatures.

Leatherback nests have been found here in 1998, 2000, and 2002. These two-year intervals represent the minimum period between egg laying cycles for an individual female leatherback.

The presence of a leatherback nest in 2003 confirms that more than one female of the species uses CAHA as a nesting ground. No other leatherback nests were reported for other areas of North Carolina in 2003. Two were reported in South Carolina. CAHA remains the northernmost nesting location on record for the species (Rabon et al, 2004).

Nests were documented by patrols surveying the beaches beginning at dawn each day between June and August. It is unknown if any nest were laid prior to the monitoring season. Small numbers of loggerhead nests have been found in May in past years. A leatherback nest was found as early as April 16 in 2000.

Treatment

Nests were either left in place or relocated for environmental reasons. In general, nest relocation has been discouraged under recommendations of the NCWRC and USFWS; therefore, with few exceptions nest relocation was confined to nests that might be threatened by erosion or overwash.

In a situation where eggs were believed to be present but could not be found, the activity was categorized as a "dig". Rather than abandoning the site because staff could not locate eggs (recognizing the possibility of human error), these sites were closed and treated exactly like nest sites, with all information recorded, poles labeled, and transponders buried. Eight digs were recorded on Hatteras, and six were recorded on Ocracoke Island. Of these, four of the Hatteras digs and one of the Ocracoke digs were later confirmed to be nests, due to hatching. All markers and any nest evidence of the remaining nine digs were lost during Hurricane Isabel. They are all treated as nests in this report.

Of the 89 nests, 73 (82%) were protected at the original nest site and 16 (17%) were relocated (Table 3). One nest was relocated on Bodie Island, 12 on Hatteras Island and three on Ocracoke (Table 3). Of the 16 relocated nests, 10 (62%) were moved because of natural factors and six (37%) due to potential human disturbance. Several environmental factors were considered in decisions to relocate nests including, high erosion rates, close proximity to the tide line or to an unstable, escarped dune line. Many beaches in CAHA are narrowing since the artificial dune line prevents natural overwash, which would create additional beach habitat. The most common factor leading to nest relocation this season occurred when eggs were found within one mile of a fishing pier. Piers emit light pollution that attracts hatchlings, which then fall prey to fish congregating near the piers. The resource management division has submitted recommendations that would decrease light pollution generated by the three fishing piers within CAHA. Other artificial structures causing relocation are the groins at the original site of the Cape Hatteras Lighthouse near Buxton. Nests laid on the beach around the groins are very susceptible to sudden shoreline changes.

Hatching Success

Hatching events at various nests either took place in one nightly episode or intermittently over several nights. All nests were examined after hatching to determine productivity rates. Nests were excavated at a minimum of 72 hours after hatching events. In cases where hatching events or dates were unknown, nest cavities would be unearthed 80-90 days after the laying date. A total of 2,784 known eggs hatched. Of these, 2,708 hatchlings emerged from the nest cavities.

Hatching and emerging numbers were low in 2003 due to impacts caused by Hurricane Isabel that made landfall on September 18, 2003. Thirty-four (38%) of the 89 nests successfully hatched. Fifty-three nests (60%) were lost (due to the storm except one to predation). It is unknown if two others hatched before the sites were claimed by the hurricane. Prior to this storm, the average hatching success was 69.7%. No hatching was known to have occurred after the storm, reducing the CAHA overall hatching success in 2003 to a low of 27.2% (Table 4). Individual loggerhead nest success ranged from 0% to 99%. Sixty-eight leatherback hatchlings emerged from the one nest containing 83 eggs resulting in an 81.9% hatch rate.

A single hatchling was reportedly found by a visitor on the beach in an unspecified area between Avon and Buxton on October 13, one month following the hurricane. It remains unclear from which nest this turtle emerged. It is not known if the turtle was found in the surf or crawling from a nest cavity higher on the beach. Only one nest was located between these villages prior to the storm. It had not hatched near its expected hatch date of 8/26 (average 63 incubation days) likely due to high incidence of overwash. The nest was believed to be physically lost during the storm based on shoreline changes thus it is unlikely the hatchling emerged from this site. Three other nests located in front of the Cape Hatteras Lighthouse had been situated relatively near the area where the hatchling was found. None of the three could be found after the hurricane. If there had been an error made on their survival, one of the three would have been in its hatching window on 9/18. The hatchling could have come from an undocumented nest or have washed in from another site.

Nest Protection

Any single nest left in place, or relocated, was protected by an approximately 30' x 30' posted closure during the incubation period. At 55 days into incubation, these small closures were expanded to the surf line. The width of the closure was based on the type and level of use of the beach: 75' in a vehicle free area with little or no pedestrian traffic; 150' adjacent to villages or other high levels of day use; 350' in ORV areas. Opposite the surf line on the upper end of the closure, the closed area was expanded to a minimum of 50' duneward from the nest. If present, all vehicle tracks were smoothed over manually with rakes or with a steel mat attached to an ATV, so as not to impede hatchlings attempting to reach the surf (NMFS, USFWS 1991). In several cases silt fence was used behind nests nearing hatching dates. Fencing was used to block light pollution from the villages and from beach vehicles operating after dark. Fencing is often buried and/or removed by high tides and strong winds and often damaged in the process. Therefore, the use of silt fencing requires daily maintenance of the site. Larger signs were posted to notify drivers that the established closures included the surf line at all tides. Interpretive signs warned how vehicle traffic could harm eggs and hatchlings. Traffic detours behind the nest area were clearly marked with signs and reflective arrows. Signs were removed no earlier than 72 hours after hatching occurred, and after the excavation of the nest was complete.

In the 2003 season, there were 35 nests found in ORV areas. Of these, five sites required complete closures to through traffic during the expected hatching period. These complete closures excluded all ORV traffic from dune to ocean at a width of 350' parallel to shoreline. These temporary closures were necessary due to the nest location on the upper beach or in the dunes. There was not enough room behind the nests for ORV traffic to pass. These areas were

well posted and large signs warned visitors at ORV Ramps of "No through traffic to the next Ramp". The public was notified of closures that would temporarily limit ORV traffic. A press release was sent to local and regional newspapers. Local tackle shops and ORV organizations were contacted when closures were established or reopened. A notice explaining that commercial fishing activities were not allowed in any of these posted areas were given out with annual commercial fishing permits. Four of the five sites were located on the narrow beaches from Ramps 23 and 34 and one site west of Ramp 49. In addition to these, two other complete closure sites were planned but nests were lost during Hurricane Isabel.

False Crawls

Of the 137 turtle crawls located during the 2003-breeding season, 48 (35%) of these were false crawls or aborted nesting attempts (Table 5). Twenty-one (44%) of the false crawls were found in areas open to ORV use, and 23 (48%) were located in heavy day use areas such as lifeguard beaches and other sites serviced by parking lots. No false crawls were found on beaches adjacent to village development and 2 (4%) were located in areas within one mile of a pier. It should be noted that the pier areas are also in the vicinity of village beaches, in Rodanthe, Avon, and Frisco, but were included in the pier data group. The remaining two (4%) were found on beaches which did not fall into the previous mentioned categories and thus had lower concentrations of human activity. As in past years, the highest percentage of false crawls (46%) occurred on Hatteras Island in 2003.

Factors Influencing Nest Success

The single event affecting overall hatching success in 2003 was Hurricane Isabel with winds up to 110mph. The storm crossed over the barrier islands on September 18, though heavy seas and tides reached the beaches several days prior. Fifty-two nests (58%) of the 89 nest were lost in the storm whereas, 34 (38%) hatched before the hurricane. There was such extreme sand and water movement along the beaches that no evidence of any nests could be found following the storm.

One nest (1%) was depredated by a red fox. After fox tracks were noted at the site, protective wire screening was put in place. However the screening was not placed properly and a fox successfully unearthed the nest. Upon examination the next day, it appeared that the fox claimed eggs as well as hatchlings that had not yet emerged from the nest. The remaining 14 eggs were reburied and properly screened. Evidence was found of the fox attempting to regain access to the nest. The remaining eggs later hatched. The successes of two other nests are unknown, as they were lost to the hurricane just prior to excavation dates. However, before their loss no sign of hatching was observed at either site and ocean overwash was frequently noted.

Human Disturbance

It is unknown to what extent human activities disrupt nesting activities. Although CAHA remains open to the public 24 hours a day, NPS staff is not available around the clock to safeguard and monitor the Park's natural resources. Human disturbance likely occurs but goes unreported and opportunities to educate visitors are lost. Nighttime human activity can cause nesting females to abort nesting attempts. Recreational beach equipment and furniture can also cause turtles to forgo egg laying. These objects can hamper or actually trap animals attempting

to locate a nesting site (NMFS, USFWS 1991). A substantial amount of unattended personal items are left overnight on CAHA beaches in front of the villages. For the third consecutive year, turtle patrol has tied notices to personal objects found on the beach after dawn, advising owners of the threats to nesting sea turtles as well as safety issues and NPS regulations.

Closures were periodically damaged or tampered with. In two separate occasions, signs posted to protect nests were intentionally pulled out of place or broken. On four additional occasions, strategically placed poles used to help staff relocate nest cavities were removed.

Artificial light is known to disturb nesting females. It also disorients and misorients hatchlings, often with fatal results (NMFS, USFWS 1991). As large-scale beach house development along Park boundaries has intensified, so has light pollution. ORVs are permitted to operate on CAHA beaches after dark. No longer are beaches of Hatteras or Bodie Island free of light pollution. In 2003, filter fence was used in virtually all nests in these locations, whereas Ocracoke Island still has many areas free of artificial light. In 2001, a total of 773 beach fires were documented during the sea turtle nesting season and this problem continues. (Abandoned smoldering pits containing broken bottles, charred lumber, cans, nails and broken bottles remain as a continued hazard to visitors as well as turtles.) Fireworks are another source of light pollution. They are sold locally and are commonly used, although illegal, on CAHA beaches.

The 2003 turtle-nesting season came to an abrupt end with the passing of Hurricane Isabel in mid-September. Therefore, pedestrian and ORV closure violations can not be fully compared to past years. Twenty-nine incidents documenting a minimum of 70 sets of human tracks were documented in 2003. In one case on Ocracoke, a visitor left an incubation closure when asked by park staff but then reentered claiming the Park was infringing on his rights and as well as his dog's rights. Seventy-nine per cent of the incidents were recorded on Hatteras Island and the remaining 21% on Ocracoke Island. Numbers of tracks recorded in each case varied from one to 20 sets of tracks.

Many but not all beach drivers respected marked turtle areas. In 2003, 19 incidents documenting at minimum 45 sets of vehicle tracks were noted within closures. Incidents were evenly divided between Hatteras and Ocracoke Islands. This is likely a conservative number since observers were not present at all sites at all times. Additionally, evidence of tire tracks washed away with each high tide. ORVs drove through areas where signs and reflective arrows clearly marked established detours behind the closures. Most ORVs drove in front of the nest areas during periods of low tide. Signs could not be placed in the low tide area, since they would wash away with the approach of each high tide and accompanying waves. Signs placed at the high water mark did state the surf line was closed at all tides. Also, PVC pipes were driven into the sand from the signs to the low tide line and marked with string and flagging emphasizing the tidal closure. Thirteen of the 19 incidents recorded were observed near the tide line while the remaining tracks were found on the higher sections of the beach. On one occasion, a truck was parked within the posted closure. The closure that was breached most often was located east of Ramp 49 near Frisco, a heavy ORV traffic site. This well posted area was a complete closure. In one case 17 sets of tracks were recorded through the site. There were four cases reported of vehicles causing property damage to signs, posts and twine protecting sea turtle nests parkwide.

NCWRC contacted CAHA concerning a report of a turtle taken from Park beaches. As reported, a woman removed a post-hatchling loggerhead from the beach in the Buxton/Avon area on October 13, 2003. The woman took it to an animal medical center in New York City on October 15 where it died. The Riverhead Foundation for Marine Research and Preservation in Riverhead, New York took custody of the carcass on October 16. National Marine Fisheries Service (NMFS) was investigating the case.

Dog Disturbance

Dogs continue to enter closures. Tacks were documented within closures a minimum of 12 different occasions. A pet leash law, carrying a \$100 fine, exists at CAHA. The regulation is not consistently enforced in all areas of CAHA. Many dogs on the beach are not leashed or only leashed by their owners as park vehicle approaches. Dogs can be a serious threat by digging up incubating eggs. From mid-May through mid-September, data was collected on the number of leashed vs. unleashed dogs observed along the Seashore beaches. Again these are conservative figures since not all beaches were observed at all times. A total of 3425 dogs were documented. Of these, 1971 were unleashed and 1454 were leashed.

Predator Removal

Red fox populations have been expanding their range southward in CAHA. They were first reported on Bodie Island in 1996 and on Hatteras Island in 2000. The new Hatteras Island fox population likely used the Bonner Bridge as a corridor to the island last year. Melvin Covey, a Buxton resident, observed a red fox moving south on the bridge in 1999. This route may be continuing. Kris Fair, Pea Island Wildlife Refuge, observed a dead red fox on the bridge approximately 100 yards from the northern terminus in October, 2002. There are no historical records of red fox on Hatteras Island. Fox destroyed several sea turtle nests and emerging hatchlings in 2001. Based on the continued and growing danger fox present to threatened and endangered species, CAHA decided to trap fox. Funds were procured with the help of U.S. Fish and Wildlife Service. Professional trappers from the US Department of Agriculture (USDA) have removed a total of 43 fox from CAHA in 2002 and 2003. Of these, 30 were from Bodie Island and 13 were from Hatteras Island. Twenty-eight fox were trapped in 2002. This season, a total of 15 red fox were taken during the predator management work from June 2 -14, 2003. Of those, 14 red fox were removed from Bodie Island, which included 3 adult males, 2 adult females, 4 juvenile males, and 5 juvenile females. Another adult male was removed from Hatteras Island near Cape Point. The USDA trappers tried repeatedly to catch what they thought was an adult female with a few young last seen at Hatteras Inlet. They were not successful believing the hot, humid conditions were keeping the group's movements to a minimum. Similar to last year, the trappers also felt that a den or two may be located at the north end of Hatteras Island, possibly within PIWR or the three northern villages of Rodanthe, Waves and Salvo. Red fox still remain on Bodie Island.

Stranding Activity

In 2003, 109 stranded turtles were documented along the shores of CAHA (Table 6, Chart 2). This represents a 17 % increase from 2002. Annual totals between 1996 and 1998 ranged between 47 and 98 turtles, and increased significantly in 1999 and 2000. This number decreased

in 2001 and then has increased in the past two years. This year's strandings increased on ocean beaches, but decreased on inshore (sound side) beaches as compared to 2002. Eighty-eight (81%) were recovered from the ocean beach and 21 (19%) on the soundside. Hatteras Island reported the highest stranding numbers, 84 (77%). While Ocracoke and Bodie Islands reported 22 (20%) and 3 (3%) respectively. Park wide, 87 (80%) were identified as loggerhead, 11 (10%) were green, 8 (7%) were Kemp's ridley, 2 (2%) were leatherback, and 1 (1%) was unknown.

Eleven turtles (10%) were alive when discovered. NC Sea Turtle Network volunteers helped transport most turtles to the Roanoke Island Animal Hospital. Veterinarians made health assessments and if possible the animals were then taken to holding tanks at the NC Aquarium in Manteo, North Carolina. Network for Endangered Sea Turtles (NEST), a volunteer group based in Nags Head area, continue to care for them until they can be released. Nine of these animals appeared to be victims of hypothermia when sound side water temperatures dropped in response to cold fronts. A hypothermic Kemp's ridley died overnight before being transported to the animal hospital. One live loggerhead was released from recreational fishing line that it was tangled in 30 feet offshore from the beach in Buxton. It took two attempts to free the turtle. Only on the second attempt did a visitor free the line that was anchored to the bottom and attached to the turtle. One live post hatchling was recovered and removed from the beach by a park visitor. The visitor transported the animal to a New York City animal clinic where it eventually died. NMFS and CAHA law enforcement staffs were notified.

Ninety-eight (90%) turtles were dead when found. Though carcasses were found throughout the year, the month of April had the greatest number of strandings with 24 reported (Table 7.) Carcass wounds or anomalies that may have contributed to the death of the turtle were recorded. Seven turtles were missing part or all of a flipper, two had head injuries, nine had carapace damage, five were found with boat propeller scars, and one was found entangled in quarter inch line. The remaining turtles showed no obvious cause of death or were too far decomposed to tell. Turtles were searched for Passive Integrated Transponder (PIT) tags and metal tags. One PIT tag and six metal tags were found on four loggerhead turtles (Table 8). The National Marine Fisheries Service (Beaufort Laboratory) tagged three of the turtles locally in the Core Sound. At least one of these turtles was removed from a pound net as part of a mark/recapture study. Another turtle was tagged in the Madeira Islands in the eastern Atlantic near the coast of Morocco. Necropsies were performed on six turtles. All or parts of 15 turtles were salvaged under permits with NCWRC. State biologists transferred specimens to NMFS biologists conducting DNA and aging studies.

Conclusions and Recommendations

Breeding activity was more active along south facing beaches this year likely due to cooler than normal temperatures. Hatching success was extremely poor due to impacts of Hurricane Isabel. This follows a year when hatching success was higher than normal due to the prevalence of warm, dry weather. Leatherback nests have been found in four of the past six years. It is very possible that some nests are being missed since daily turtle patrols are tailored to loggerhead biology. Leatherback nesting has been noted here in April. Fox predation has been greatly reduced by the trapping efforts. Trapping efforts need to continue. Similar to last year, false

crawls constituted 35% of sea turtle activity this season. It is unknown how many nesting attempts were aborted due to natural or human disturbances.

CAHA is reducing the number of nests relocated due to potential human disturbances. Though compliance was fairly good, there were still a significant amount of drivers who disregarded the posted closures. Violations were most common in high ORV use areas where closures temporarily restricted through traffic. The Resource Management Division would need much more staff if it were to station monitors at closures to direct traffic. Law enforcement presence also needs to increase. Efforts made to educate the public through the media should continue. Local bait and tackle shops were notified of all beach closures and any changes in these closures.

Nighttime activities potentially impacting breeding activities need to be continually examined at CAHA. These include beach driving, village light pollution and campfire activity. It is also essential to make sure no NPS facility is producing light pollution. NPS needs to work with Park concessionaires to reduce nighttime lights. In the future it is hoped that a portion of the concessionaire franchise fees may be used to help fishing piers purchase "turtle friendly" lights.

The presence of artificial dune lines along the Seashore inhibits natural overwash processes. The resulting narrow beaches leave limited turtle nesting habitat. Hurricane Isabel pushed back the artificial dune line in many places creating a broader beach and thus more nesting habitat. The NPS Southeast Regional Office, USFWS and NCWRC visited CAHA and made resource management recommendations after the hurricane. Nesting habitat was identified and recommendations were made to protect such habitat from human disturbance. It is recommended that CAHA provide such protection in a timely manner to best protect all vulnerable beach nesting species. Quality habitat will not develop in areas where North Carolina Department of Transportation continues to rebuild and maintain the existing dunes for NC Highway 12 protection.

Stranding Activity

For the past several years, turtle mortality has been high at CAHA compared to other North Carolina sites. While stranding numbers have decreased compared to the record high in 2000, it is likely many strandings on the soundside go unreported due to limited accessibility. NCWRC Stranding Network and NEST volunteers were of great assistance to park staff once again. Efforts to document threatened and endangered sea turtle strandings need to continue. Sick and injured animals rescued are often successfully rehabilitated. Valuable information is also collected from dead stranded sea turtles and made available to other Federal and State agencies responsible for the protection and recovery of these species.

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LIST OF ATTACHMENTS

Table 1. Sea Turtle Nests at Cape Hatteras National Seashore 2003

Table 2. Sea Turtle Nests 1987-2003

Table 3. Relocated Nests at Cape Hatteras National Seashore 2003

Table 4. Hatch Success at Cape Hatteras National Seashore 2003

Table 5. Number of false Crawls by area Type Cape Hatteras National Seashore 2003

Table 6. Sea Turtle Strandings Cape Hatteras National Seashore 1996-2003

Table 7. Sea Turtle Strandings by Month at Cape Hatteras National Seashore 2003

Table 8. Tagged Sea Turtle Found at Cape Hatteras National Seashore in 2003

Chart 1. Cape Hatteras National Seashore Sea Turtle Nests 1988-2003

Chart 2. Sea Turtle Strandings Cape Hatteras National Seashore 1996-2003

**Table 1. Sea Turtle Nests at
Cape Hatteras National Seashore 2003**

Species	# of Nests
Loggerhead	86
Green	2
Leatherback	1
Total	89

Table 2. Sea Turtle Nests 1987-2003

1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
11	22	26	32	70	38	45	94	69	39	39	98	92	84	75	101	89

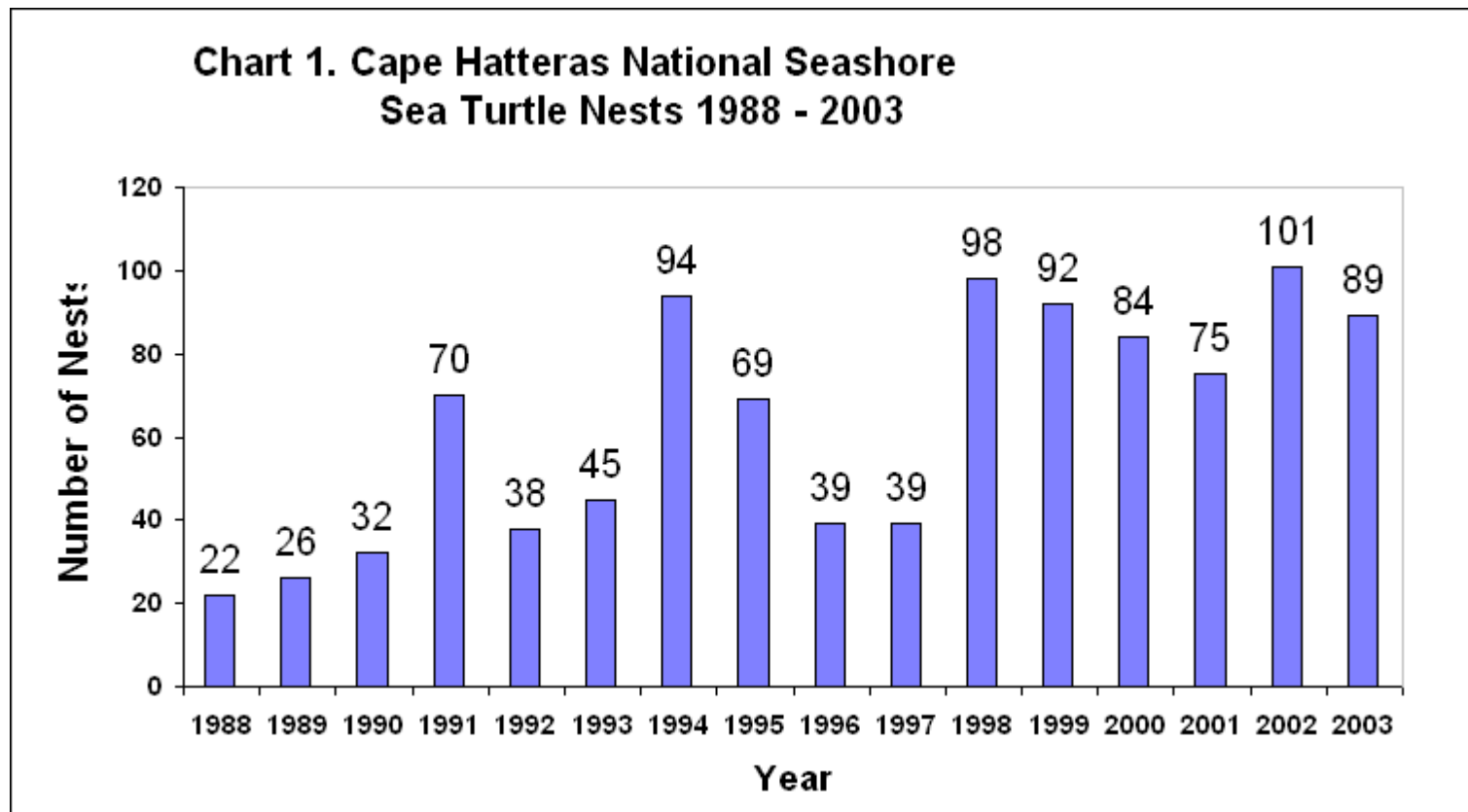


Table 3. Relocated Nests at Cape Hatteras National Seashore 2003

	Total for CAHA	
Relocated nests	16	18%
Non-relocated nests	<u>73</u>	82%
Total	89	

	HATTERAS ISLAND	
Relocated nests	12	23%
Non-relocated nests	<u>41</u>	81%
Total	53	

	OCRACOKE ISLAND	
Relocated nests	4	0%
Non-relocated nests	<u>31</u>	100%
Total	35	

	BODIE ISLAND	
Relocated nests	1	11%
Non-relocated nests	<u>0</u>	89%
Total	1	

Table 4 . Hatch Success at Cape Hatteras National Seashore 2003

	# of Nests	Hatch Success (%)
Hatched Nests	34	69.7%
Lost Nests	52	0.0%
Combined Season Total	89*	27.2%

* does not include two nests whose success is unknown

**Table 5. Number of False Crawls by Area Type
Cape Hatteras National Seashore 2003**

Area Type	# of False Crawls
ORV use	21
Day use	15
Village	4
Other	8
Total	48

ORV use - beaches opened to off road vehicles

Day use - beaches adjacent to day use parking lots (also used after dark)

Village - beaches bordering village development

Other - beaches on which there is not a high volume of human activity

**Table 6. Sea Turtle Strandings
Cape Hatteras National Seashore 1996-
2003**

Year	Stranding Totals	Species Composition*					Location	
		CC	LK	CM	DC	uk	Oceanside	Soundside
1996	47	26	8	10	3			
1997	98	64	17	10	3	4	62	36
1998	85	45	25	12	2	1	53	32
1999	226	149	55	22	0	0	138	88
2000	332	226	31	43	2	2	245	87
2001	69	41	11	11	4	2	46	23
2002	93	52	10	30	0	1	50	43
2003	109	87	8	11	2	1	88	21

*
 CC = Loggerhead
 LK = Kemp's ridley
 CM = Green
 DC = Leatherback
 uk = unknown

**Chart 2. Sea Turtle Strandings
Cape Hatteras National Seashore 1996-2003**

