

# Confirmed Leatherback Turtle (*Dermochelys coriacea*) Nests from North Carolina, with a Summary of Leatherback Nesting Activities North of Florida.

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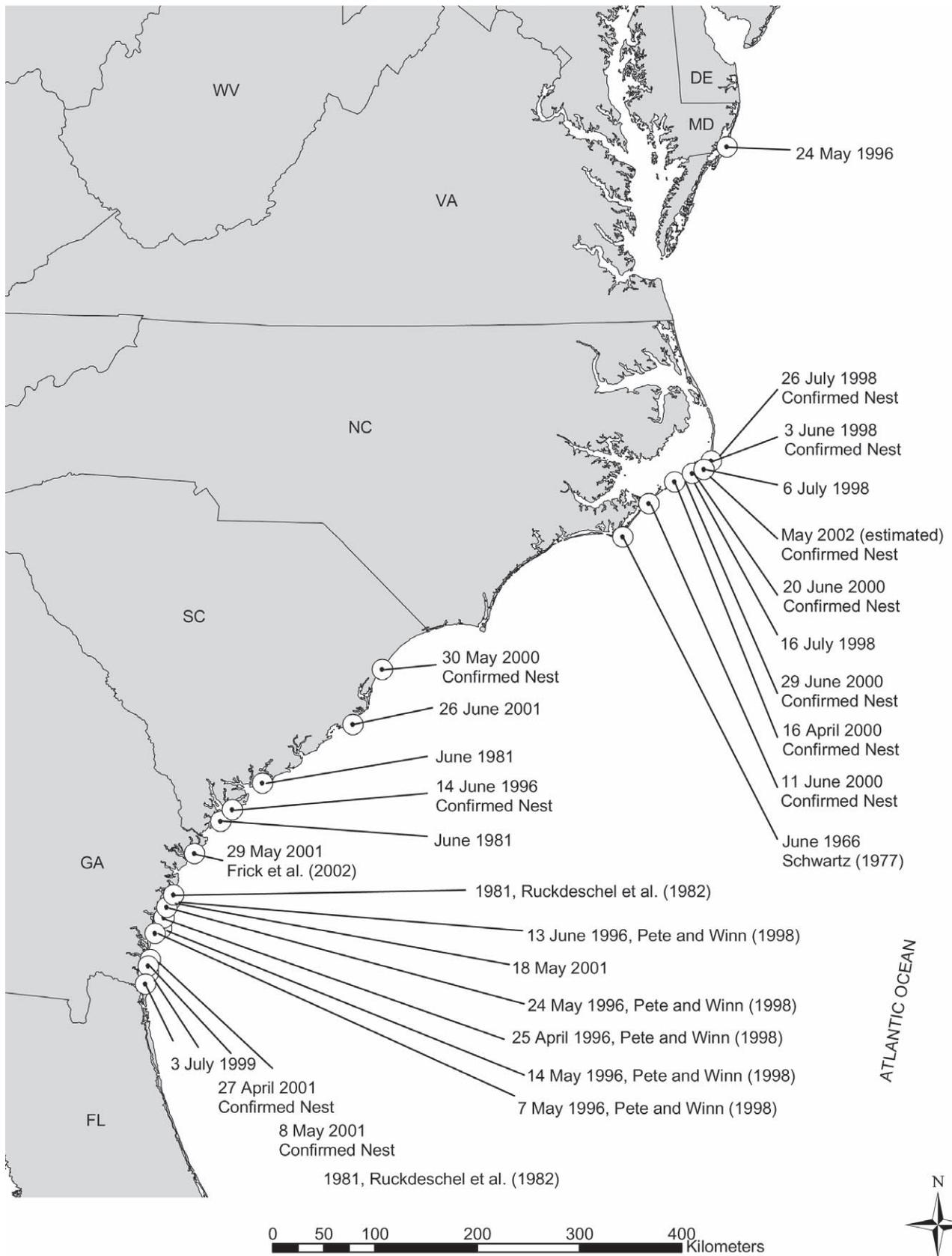
Leatherback turtles (*Dermochelys coriacea*) nest circumglobally, primarily on beaches in the tropics, many of which have experienced severe population declines in recent decades (NMFS & USFWS 1992, 1998; Spotila *et al.* 1996). However, extremes in nesting distribution occur in temperate regions in the Western Atlantic. In South America, leatherback nests have been reported as far south as Torres, State of Rio Grande do Sul, Brazil (Soto *et al.* 1997). In North America, the northeast coast of Florida was considered the northern limit for leatherback nesting until the early 1980s (Allen & Neill 1957; Caldwell 1959; Caldwell *et al.* 1956; Nichols & Du Toit 1983; Seyle 1985). In 1981, two confirmed leatherback nests were documented in Georgia on Cumberland (Camden County) and Blackbeard (McIntosh County) Islands (Ruckdeschel *et al.* 1982). Recently, Frick *et al.* (2002) reported a single leatherback nest on the northern end of Wassaw Island (Chatham County), Georgia, as the northernmost verified leatherback nest on the East Coast of the United States. Herein we report confirmed leatherback nests in North Carolina, thus extending the northernmost nesting range for the species in eastern North America. We also report previously unpublished records of leatherback nesting activity in Georgia, South Carolina and Maryland.

Although adult leatherbacks are common in the Atlantic Ocean off the coast of North Carolina at certain times of the year (Epperly *et al.* 1995; Grant *et al.* 1996; Lee & Palmer 1981), nesting in the State is infrequent. The first potential evidence of leatherback nesting in North Carolina was in 1966 in the form of an unconfirmed report of hatchlings found on South Core Banks, near Cape Lookout (Carteret County)

(Schwartz 1976, 1977). Since then, no credible reports of leatherback nesting activity were reported in the State until the summer of 1998. Confirmed nests also were reported during the 2000 and 2002 nesting seasons.

During the 1998 nesting season two confirmed nests (i.e., eggs or hatchlings observed), one on 3 June and the other on 26 July, and two potential nests (i.e., an unconfirmed nest reported as a “false crawl”) on 6 July and 16 July, were observed at Cape Hatteras National Seashore (Dare and Hyde Counties), North Carolina. The 6 July and 16 July events may have actually been nests. In both instances the turtle disturbed a very large area of sand, but despite an exhaustive search for the clutch and regular monitoring of the area, no eggs or evidence of hatchlings were found. The 26 July nest was lost to erosion as a result of the landfall of Hurricane Bonnie on 26 August 1998, near Wilmington, North Carolina. The 3 June nest produced hatchlings, but because of the condition of the remains of the nest when it was excavated (i.e., many small eggshell fragments), clutch size and hatching success were not estimated. One full-term embryo was salvaged from the remains of the clutch (n=26 yolked eggs) and deposited in the North Carolina State Museum of Natural Sciences (specimen no. NCSM 62550).

During the 2000 nesting season four leatherback nests were confirmed in North Carolina. Three nests (16 April, 20 and 29 June) were documented at Cape Hatteras National Seashore and one (11 June) at Cape Lookout National Seashore (Carteret County). On 10 July 2000, the 16 April nest was excavated – no eggs hatched and clutch size was estimated as 70 yolked and 15 yolckless eggs. The 11 June nest was excavated on 29 August 2000 – eggs appeared to have hatched



**Figure 1.** Leatherback turtle (*Dermodochelys coriacea*) nesting activity along the East Coast of the United States of America, north of Florida. Individual locations were plotted using ESRI, Inc., ArcMap 8.2 software and the “State Boundaries of the United States” data layer from the U.S. Geological Survey.

and clutch size was estimated as 101 yolked and 31 yolkless eggs. Hatchlings from the 20 June nest emerged on 7 September 2000 – clutch size was estimated as 99 eggs (86 hatched and 13 unhatched), and hatching success was estimated as 87% when excavated on 13 September 2000. The 29 June nest was excavated on 22 September 2000, but because eggs could not be found during the final nest examination, clutch size and hatching success were not determined.

One leatherback nest was confirmed in North Carolina in 2002. The date of egg deposition is unknown and the nest was not discovered until 12 August when hatchling tracks were noted near the Town of Frisco (Dare County) within the Cape Hatteras National Seashore. The nest was excavated 72 hours later and leatherback hatchlings were found. The nest had an estimated clutch size of 96 yolked and 29 yolkless eggs, and the hatching success was estimated as 26% (n=25) of yolked eggs (emergence success was 24% because two dead hatchlings were found in the nest). Because park biologists had no record of a sea turtle nesting emergence in the area, the turtle likely nested before crawl surveys were initiated in June.

Twelve leatherback emergences have been documented on Georgia beaches; the earliest of these were reported by Ruckdeschel *et al.* (1982), the most recent by Frick *et al.* (2002). Pete and Winn (1998) reported three leatherback nests from Sea and Sapelo Islands (Glynn County) and two non-nesting emergences from St. Simons (Glynn County) and Blackbeard (McIntosh County) Islands in 1996. Previously unpublished records include four additional leatherback nesting events. A probable nest was reported on 3 July 1999 on Cumberland Island (Camden County), but the potential nest site was lost to erosion caused by Hurricane Floyd, which made landfall near Wilmington, North Carolina on 16 September 1999. In 2001, two nests from Cumberland Island (Camden County) were documented on 27 April and 8 May. On 18 May 2001, an additional probable nest on Blackbeard Island (McIntosh County) was evidenced by a single yolkless egg found at the site. Unfortunately, additional information on these nesting events is not available.

Along the coast of South Carolina, two non-nesting emergences were observed during aerial beach surveys in June of 1981 on Hilton Head Island (Beaufort County) and Edisto Beach State Park (Colleton County). On 14 June 1996, the first State record of a leatherback nest was documented on St. Phillips Island (Beaufort County) during an aerial survey of the beach. Clutch size was estimated at 117 eggs, and they hatched successfully; although 30 hatchlings were found dead

on the surface of the sand near the nest site. One full-term embryo was salvaged from the remains of the clutch and is on permanent loan to the University of South Carolina Beaufort at Pritchards Island (specimen no. PI-0196-USCB). On 30 May 2000, a leatherback turtle was discovered at Huntington Beach State Park (Georgetown County) at about 0600 hours in the process of laying eggs. Biologists relocated the nest (under appropriate State and Federal permits) because it was laid in an area prone to overwash. The nest contained 50 yolked and 53 yolkless eggs; an additional 4 yolked eggs were crushed by the turtle during nesting. Signs of hatchling emergence were noted on 29 August and the nest was excavated on 5 September 2000. Hatching success was estimated at 18% (n=9) of yolked eggs. The remaining eggs perished in early development (n=32), late development (n=1), or were depredated (n=8) by ghost crabs (*Ocypode quadrata*). The turtle was not tagged and the left rear flipper was missing; no other abnormalities were noted. Curved-carapace length was 135 cm and curved-carapace width was 113 cm. These measurements fall within the size range of adult leatherbacks recorded from the southeastern United States (NMFS & USFWS 1992). A leatherback emergence was reported on Cape Island (Cape Romain National Wildlife Refuge, Charleston County) by refuge biologists on 26 June 2001, but no additional information is available.

One leatherback emergence has been documented from Maryland. On 24 May 1996, a park biologist observed daytime nesting of a leatherback on Assateague Island National Seashore (Worcester County), Maryland. The turtle was observed for approximately one hour as she crawled in three tight circles that were connected by curving loops. This occurred within 0.5 meters above the high tide line and the turtle returned to the water around 1000 hours. A potential egg chamber was found at the site; however, no eggs were found despite a thorough search of this area. The turtle was measured before she returned to the water and had a curved-carapace length of 139.7 cm and curved-carapace width of 106.7 cm. The flippers were checked for tags or tag scars, but none were evident; although a portion of the right rear flipper was missing.

Leatherback nesting activity has not been reported from the beaches of Virginia; however, most of the Commonwealth's beaches are not regularly monitored for sea turtle nesting activity. Virginia's southern beaches within Back Bay National Wildlife Refuge and the City of Virginia Beach have been monitored since 1980 and 1993, respectively, but leatherback nesting

activity has not been reported (Williams & Gallegos, 2000; Cliche & Gallegos 2001). Additionally, leatherback nesting activity has not been reported on Virginia's portion of Assateague Island, where biologists have monitored piping plover (*Charadrius melodus*) nesting activity since the mid-1980s.

In summary, seven *Dermochelys* nests have been confirmed in North Carolina, eight nests confirmed in Georgia, and two nests confirmed in South Carolina (Figure 1). Numerous non-nesting emergences, some of which were probably nests, have been observed in these states. A single nesting attempt, which may have resulted in the deposition of eggs, was recorded in Maryland. The number of turtles responsible for these events and the factors associated with the apparent increase of nesting activities outside of the historical range of this species are unknown. Florida, however, hosts a small nesting colony of leatherbacks that has been significantly increasing (Witherington & Koeppl 2000) and may be the source population of the nesting females reported here.

The North Carolina records constitute the northernmost, confirmed reports of leatherback nests along the East Coast of the United States. Almost all *Dermochelys* nesting activity in North Carolina has been concentrated along beaches between Cape Lookout and Cape Hatteras, and confirmed nests have only been documented in 1998, 2000, and 2002. Leatherback sea turtles nest every two to three years and their average intraseasonal nesting interval is approximately nine to ten days (NMFS & USFWS 1992). Thus, the nesting emergences we report here for North Carolina could represent the activities of a single female.

Because leatherbacks on the East Coast of the United States may nest as early as late February (Meylan *et al.* 1995), current data for North Carolina are probably an underestimate of actual leatherback nesting activity. Beach patrols usually commence in May or June to maximize observations of nesting loggerhead turtles (*Caretta caretta*); therefore, leatherback nests may have been missed. Management considerations for the leatherback turtle nesting along the beaches north of Florida should include adjusting the commencement of beach patrols to account for its early initiation of nesting activities. This is of particular importance in areas that might be affected by beach management activities (e.g., beach driving, beach nourishment, beach bulldozing, etc.), which are primarily conducted during the winter and early spring.

*Acknowledgments:* We thank R. Steward for alerting Assateague Island National Seashore biologists of the presence of a leatherback in Maryland, K. Labrie and A. McClelland at Cape Romain National Wildlife Refuge, and all the volunteers who participated in monitoring sea turtle nesting activity in Georgia, South Carolina and North Carolina. Special thanks to T. Rice for preparing Figure 1, and to S. MacPherson, M. Godfrey and an anonymous reviewer for providing many useful comments on the manuscript.

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## **Monitoring Nesting Loggerhead Turtles (*Caretta Caretta*) in the Central Caribbean Coast of Colombia**

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Four of the world's seven sea turtle species nest on the central Caribbean coast of Colombia. These are the loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*) and green turtles (*Chelonia mydas*). Although the loggerhead turtle is still the most common species, it has widely felt that it has declined in nesting abundance over the last 30 years at the Guachaca, Mendihuaca, Buritaca, Don Diego and Quintana nesting beaches in the Magdalena Department (Amorocho *et al.* 1999; Marrugo & Vasquez 2002; Muñoz *et al.* 1989; Pinzón *et al.* 1996; Ramirez 1975; Figure 1). The reduction of this nesting population mandates a recovery plan for its conservation in the Colombian Caribbean.

Herein I describe the nesting activity of loggerhead females and the hatching success obtained from nests transferred into protected hatcheries during the 2001 breeding season in a study area defined along the coast of the Magdalena Department between 11° 16' N - 73°

51' W and 11° 15' N - 73° 39' W, which includes the Mendihuaca, Guachaca, Buritaca, Don Diego and Quintana beaches, historically known as the main nesting ground for loggerheads in Colombia (Medem 1962, Kaufman 1968, Kaufmann 1971, Tufts 1972). The Buritaca nesting reserve is located between the mouths of the rivers Buritaca and Don Diego and it is locally referred as Don Diego beach (see Figure 1).

Eighteen of the 21 km of nesting beaches between the mouths of the Mendihuaca and Palomino rivers were monitored four nights each week from May 17 to September 2 of 2001. After this date, nighttime surveys were suspended due to security conditions in the area. Data gathered after September 2 during occasional daytime surveys has not been considered for the analysis of the results.

The nests collected by the research team within the study area were transferred into two protected hatcheries managed by a local NGO, which conducts