Nesting of Loggerhead Sea Turtles,

Caretta caretta, in Virginia

Final Report Submitted to

the Environmental Protection Agency

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By

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INTRODUCTION

In May of 1980, we initiated a project to evaluate the nesting use of Virginia's Atlantic coastal beaches by the loggerhead sea turtle, *Caretta caretta*.

The loggerhead is considered an endangered species by the Commonwealth of Virginia and the species is on the federal threatened list.

Funds for the study were provided by a fellowship stipend from the City of Danville, Virginia through the Environmental Protection Agency.

The loggerhead is the most common nesting marine turtle in the United States and the southeast coast is one of only four major loggerhead nesting areas remaining in the world (L.M. Ehrhart, personal communication). The species is the most commonly occurring sea turtle of the four species that enter Virginia's nearshore waters and the Chesapeake Bay during warm weather. The Chesapeake Bay and adjacent marine waters serve as a major summer feeding area for subadult loggerheads (M. Lutcavage, unpublished Master's Thesis, VIMS, 1981).

Carr (1952, p. 390) described the U.S. breeding range of *Caretta* as the southern coast and "formerly from Virginia to Florida and the Gulf states" and Ernst & Barbour (1972, p. 233) state that although it formerly nested in Virginia, today's breeding range "probably is restricted to points south of Cape Lookout, North Carolina." However, on several occasions nesting by loggerheads has been reported on the beaches of the Barrier Islands of the Delmarva Peninsula and on or near the Back Bay National Wildlife Refuge (NWR). In spite of the paucity of verified records (see Appendix I), we believed the actual incidence of nesting might be much greater due to several factors enumerated below.

1. Nearly all of Virginia's Barrier Islands are uninhabited with extremely limited access. The majority of the Barrier coast is under stewardship of the Nature Conservancy which intends the perpetual preservation of the ecosystem (Hennessey, 1976), controls access to the islands, and patrols only infrequently to keep unauthorized persons off the lands, all of which are only accessible by boat. Recent and current nesting may not have been observed and therefore could not be reported.

2. The Back Bay NWR is also remote and uninhabited and not regularily patrolled by Fish and Wildlife Personnel. Although there is more public access to this section of beach, unnoticed or unreported nesting may have occurred.

3. Concentrations of adult sized loggerheads are found in Virginia's coastal waters during summer months. They are particularily abundant in the tidal channels and other waters around the Barrier Islands. Caldwell, Carr and Ogren (1959) note that male and female loggerheads congregate for mating near a nesting beach during the reproductive season and the

reports of adult size sea turtles in our area may be circumstantial evidence that suggests nesting activities.

4. In 1969, the U.S. Fish and Wildlife Service initiated a program of transplanting *Caretta* eggs from nests laid at the Cape Romain (South Carolina) NWR to Chincoteague, Back Bay and Pea Island NWR's. According to Rick Poetter, assistant manager of the Back Bay NWR, from 1969 through 1979 over 14,500 hatchlings were released on Virginia's beaches. The purpose of the transplantation program was to attempt a northward extension of the breeding range of the Atlantic loggerhead to coastal NWR's in Virginia and North Carolina where nesting colonies could be "reestablished" on protected beaches (unpublished U.S.F.W.S. Progress Report No. 11, October 31, 1979).

As the survivors of these efforts reached maturity, it was assumed they would return to beaches where they first crawled into the ocean as hatchlings and lay their eggs.

DESCRIPTION OF STUDY AREA

1. The Eastern Shore

The Eastern Shore of Virginia is the southernmost portion of the Delmarva Peninsula bounded on the north by the State of Maryland, on the west and south by the Chesapeake Bay and on the east by the Atlantic Ocean. Low barrier islands backed by extensive tidal marshlands and lagoon systems separate the mainland of the Peninsula from the Atlantic Ocean. The thirteen islands which compose the outermost barrier system are interrupted by twelve major tidal inlets (see Map 1).

Unbroken island coastal lengths range from approximately 2.7 kilometers for Myrtle Island to approximately 13 kilometers for Parramore Island. The total length of Atlantic shoreline composed by Virginia's Barrier Islands is approximately 82 kilometers.

These barrier Islands vary from low sand overwash areas and eroding old marshlands to well defined sandy beaches backed by stable dune ridges and maritime forests. All of the islands grade into extensive tidal marshes and upland islands to the west.

The generally narrow beaches consist of fine to coarse siliceous and carbonate sands with varying amounts of shell fragments. They range from well sorted to not well sorted sands. Hennessey (1976) describes the higher and older frontal dunes as excessively drained soils of the Newhan series (fine sand) vegetated by herbaceous plants interspaced with open areas of slight vegetation marked by blowing sand. Typically behind the frontal dunes, flatter areas of Corolla fine sands, Corolla fine sand overwashes or complexes of soil types are found. These soils support a wide variety of herbaceous and woody plants.

This is a high energy shoreline with erosion and sand transport altering the island beach configuration markedly from year to year and season to season.

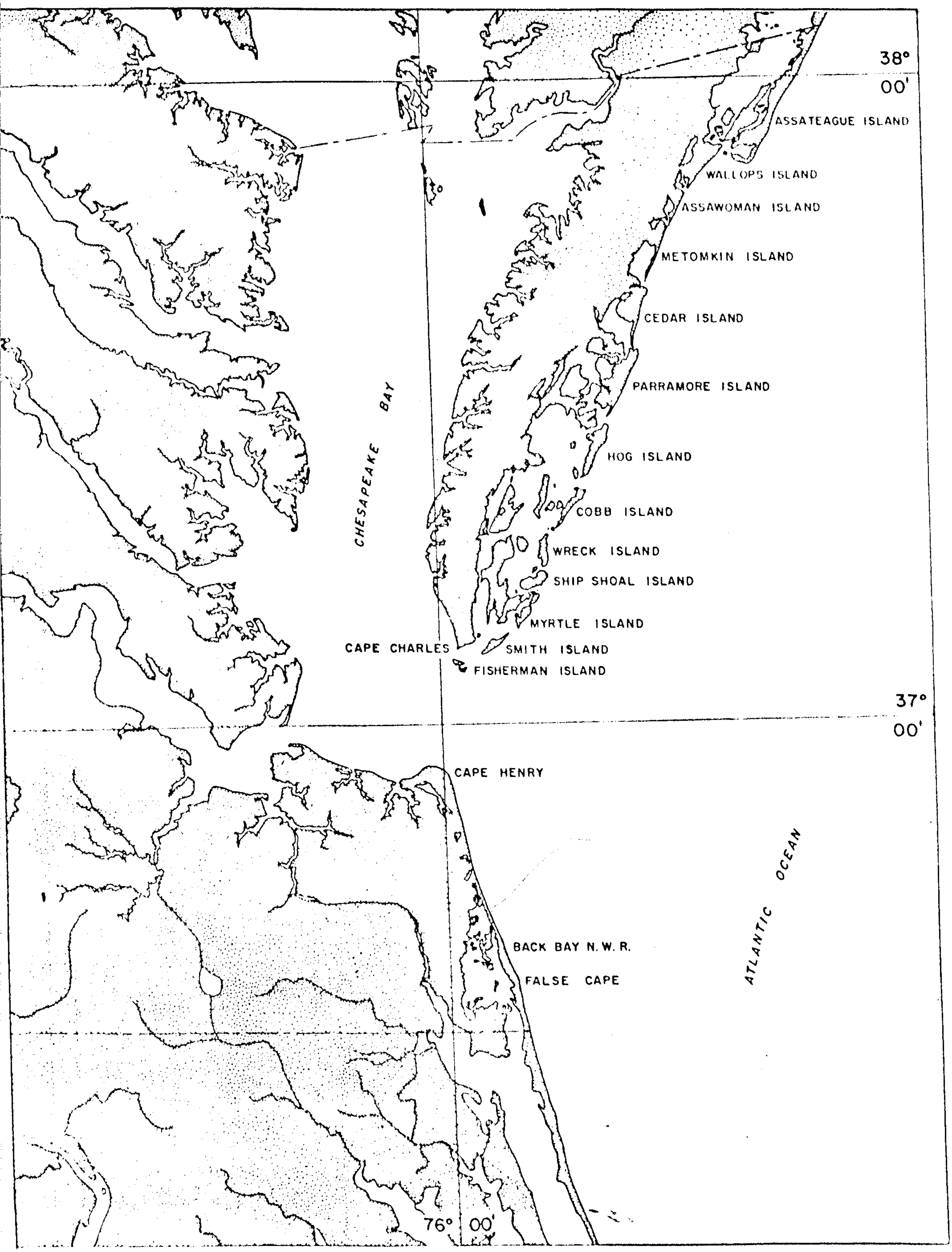
2. Cape Henry and South

South of the Chesapeake Bay mouth, Virginia's 43 kilometer Atlantic coast is typically a low barrier beach in the southern half; bounded by the North Carolina state line to the south and Back Bay waters and marshes (a northward continuation of Currituck Sound) to the west. The northern half of the region is low mainland beach bounded by the Bay mouth at Cape Henry.

The beach south of the Bay mouth is wider, more stable and has a higher, continuous dune with fewer overwash areas than the Eastern Shore beaches. The extensively developed Virginia Beach area has a serious erosion problem that requires tons of sand be trucked in to replace sand lost to erosion.

Soil, sand, and beach types are similar to those of the Barrier Islands described in 1. above.

Map 1


38°
00'
ASSATEAGUE ISLAND
WALLOPS ISLAND
ASSAWOMAN ISLAND
METOMKIN ISLAND
CEDAR ISLAND
PARRAMORE ISLAND
HOG ISLAND
COBB ISLAND
WRECK ISLAND
SHIP SHOAL ISLAND
MYRTLE ISLAND
CHESAPEAKE BAY
CAPE CHARLES
SMITH ISLAND
FISHERMAN ISLAND
37°
00'
CAPE HENRY
ATLANTIC OCEAN
BACK BAY N. W. R.
FALSE CAPE
76° 00'

MATERIALS AND METHODS

The survey of the suitable Virginia nesting beaches was made weekly by aircraft flying at 45 to 90 meters in altitude except in areas of human activity where a 150 meter minimum distance was maintained. Air speed was kept as low as conditions and safety permitted--generally around 75 knots. One observer and the pilot were the minimum crew with added observers when possible to aid in overwater and coastal nearshore sightings of waterborn turtles.

The VIMS aircraft, a single-engined, high-winged de Haviland Beaver was used for most of the flights. The plane is designed as a military observer craft and is ideally suited for low-level aerial surveys. Due to budgetary and availability problems, various Cessna 150 and 170 class planes were rented for some of the earlier flights.

The methodology followed guide lines established in planning meetings held by the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS) and the sea turtle recovery team. The purpose of the meetings was to discuss and plan aerial survey methodology, techniques and details for the 1980 nesting season in the Southeastern U.S. Methods outlined in a NMFS, SE Fisheries Center, February 5, 1980 memo by Fred Berry and Nancy Thompson were adopted and used by sea turtle researchers in the SE Region. The basic methods outlined in the above memo were utilized in the present study.

The Virginia coast from Chincoteague Island to False Cape was examined at weekly intervals from 15 May 1980 to 19 August 1980 for a total of fifteen flights.

RESULTS

1. Sea Turtle Observations

No turtle tracks that resulted in a nest were observed during the weekly flights. One non-nesting track was noted on south Parramore Island, the 24th of May, flight Number 2. This was a small (approximately 50 cm wide), wandering track.

One documented loggerhead nesting occurred which was witnessed by the public on a heavily used portion of Sandbridge Beach on the night of the 25th of July. The tracks were immediately obliterated by curious onlookers. US FWS employees from Back Bay NWR carefully exhumed the nest within 12 hours of deposition and reburied the 104 eggs in two nearly equal numerical parts side by side in a protected area of the refuge beach for incubation. The clutch was split in order to use protective wire enclosures already in hand. Ninety eggs hatched out on 29 September and 1 October, 1980 for an extremely good hatch of 86.5%.

Live, waterborn sea turtles were seen on seven of the survey flights and are listed in Table 1. Many live specimens were probably missed as a result of closely monitoring the beach and not the adjacent waters. The stranded, dead turtles observed on the beaches are recorded in Table II.

2. Ancillary Observations

On 9 June a saddleback dolphin, *Delphinus delphis*, was observed dead on the Hog Island beach. The specimen was washed off the beach by the tide before positive identification could be made. On 7 July, an adult dwarf sperm whale *Kogia simus* was observed and examined on a sandbar in Chincoteague Inlet. Identification was later confirmed by the Smithsonian Institute.

Table I

Live Waterborn Loggerheads - 1980

Date	Location	Comments
9 June	N. Bay Bridge Tunnel	2, heading into Bay
	Bay - Wolftrap Light	1, heading north
	Bay - New Point Comfort	1 < 25 cm, heading NNE
17 June	Kitty Hawk Pier, N.C.	1 heading north
	Dam Neck area	3 heading north
	Rudee Inlet (offshore)	1, heading north
1 July	Currituck Co., N.C.	1, heading north
	Bay - 3km SE of Grandview	1, heading UpBay
7 July	Bay - SW of Fisherman's Island	2, 40-50cm, heading UpBay
	1.6km E of Trestle "B" CBBT	1, direction not noted
	Corrolla Lighthouse, N.C. 300m offshore	1 large, heading north
	" " " " " " "	1 60-75cm, heading offshore
	N.C. State Line, 300m offshore	1 large, not active
	3km N of Cape Henry and 1.5km E of Thimble Shoals Channel	1, heading towards Bay
	Just W of Trestle "B" CBBT	1 ~ 75cm, heading north
	Bay - 10km NW Tunnel CBBT	1 ~ 60cm, heading east
	Bay - <1km E of Grandview	1 ~ 45cm, heading UpBay
15 July	0.5km S of Fisherman's Island	1 large, heading south
1 Aug.	Currituck Co., N.C., >1.5km offshore	4, direction not noted
5 Aug.	Bay - 3km NW of Tunnel CBBT	1, direction not noted
19 Aug.	Wachapreague Inlet	1, heading east

(CBBT = Chesapeake Bay Bridge Tunnel)

Table II

Stranded Dead Loggerheads - 1980

Date	Location	Comments*
24 May	Fisherman's Island	1 bloated
30 May	Cobb Island	1 large Loggerhead
	N. Hog Island	1 small Loggerhead
9 June	Currituck Co., N.C.	2 Loggerheads, near Lighthouse
	Back Bay NWR	1 Loggerhead
	Cape Henry	1 at Lighthouse
	Fisherman's Island	2
	Ship Shoal Island	1 old, belly-up
	Hog Island	1 old loggerhead
	Parramore Island	1 buried by sand
12 June	Currituck Co., N.C.	1
17 June	N. Hog Island	1
	False Cape	1 Loggerhead
	N.C. border	1 large, belly-up
	Rudee Inlet	2 Loggerheads
24 June	Currituck Co., N.C.	1
7 July	Chincoteague Inlet	1 Loggerhead, rear crushed, 1.2 m, on sandbar
	Wallops Island	1 Loggerhead ~ 1 m

*Positive identifications are noted as "Loggerheads".

DISCUSSION

Sea turtles exhibit an ecological strategy seen in many migratory animals--that of returning to a favorable area to reproduce. Carr (1967a) and most sea turtle researchers suspect that reproductive females return to the beach where they were hatched (natal beach) in order to lay eggs. Philopatry (in this case the seasonal return to the same beach) in sea turtles is known in green turtles (Carr and Carr 1972, Carr 1975, Carr, Carr and Meylan 1978), ridleys (Márquez, et al. 1976, Zwinenberg 1977), leatherbacks (Pritchard 1976) and loggerheads (Hughes 1974, Ehrhart 1980).

Fitch and Fitch (1967) contend the egg stage in oviparous reptiles is the least tolerant to variations in environmental conditions. Therefore, the location of loggerhead nesting beaches is seemingly dictated by proper environmental conditions for adequate nesting and the subsequent successful incubation and hatch of the eggs. However, the hatchlings also must survive to maturity and reproduce viable offspring in order to perpetuate the species. The homing instinct serves as a mechanism to return the turtles to a beach that already has proved to be a successful incubation and hatching environment. This behavior has evolved in part because sea turtles have parental care investments in their offspring limited only to a temporal and spatial selection of nesting areas.

Environmental conditions on many of Virginia's beaches should be suitable for the successful nesting and hatching of loggerhead turtles:

1. The isolation and lack of human activity of the majority of Virginia's coastline would be beneficial for maintenance of a chelonery (sea turtle "rookery"; after Hirth 1980). Loggerheads pause often and look around when crawling from the surf to elevated sections of the beach to lay their eggs. During this time lights, sudden blocking of the moonlight or starlight and close-by movement can cause the turtle to return to the sea without nesting.

Lights in developed areas not only disturb the adult females but also affect the sea finding sense of hatchlings. In their crucial first hours of freedom, the principal mechanism of orientation is based on a positive phototaxis which will lead them toward the sea with its lighter horizon (Mrosovsky 1978). A case was described by Philibosian (1976) where hatchling hawksbill turtles wandered onto a brightly lit baseball field attracted by the flood lights. Mortimer (1979) reported the charred bodies of 500 hatchlings in an unattended bonfire on Ascension Island and another 100 that were crushed when attracted to a brightly lit hut where a dance was in progress. Hatchlings lured from a direct run to the sea by house or street lights could suffer higher mortality due to predation and desiccation, thereby reducing the viability of the colony.

2. The beach types of the Eastern Shore and the Back Bay NWR area are quite similar to types found in the major loggerhead cheloneries in Florida, Georgia and South Carolina

(see description of study area). Caldwell (1959) stated that aerial reconnaissance of beaches from the Atlantic Coast of Florida to North Carolina indicated that nesting turtles preferred beaches backed by high dunes or vegetation. He also found that loggerheads nesting in Cape Romain, South Carolina preferred 25 to 40 foot wide, sloping beach with a continuous outer dune. The shoreline of Virginia south of Sandbridge nearly always match these criteria and most of the large Barrier Islands have major sections fitting these criteria.

Sandy beaches are necessary for the excavation of the nest cavity. Stancyk and Ross in 1978 reported results of an attempt to correlate the amount of nesting activity of green turtles to sand characteristics on various beaches at Ascension Island. They felt they had encompassed the complete range of beach types and found the only significant reduction in nesting occurred in areas of human disturbance. Since the sand types from Virginia to Florida are much the same, differing mainly in organic content in certain areas, we feel this parameter is not detrimental to nesting in Virginia. The evidence of successful nesting presented in Number 4 below supports this conclusion.

3. Temperature is probably the most important factor limiting the ranges of reptiles. Thermal tolerance has been correlated with geographic distribution of many reptiles (e.g. Fitch 1964, Fitch and Fitch 1967, Bustard 1969, Vinegar 1973). Licht and Moberly (1965) proposed that effects on embryonic

development by temperature ranges other than optimal were factors influencing the distribution of lizards. Poikilothermous reptiles need to insure their eggs are in areas with temperatures most conductive for metabolism during incubation. The enzymes controlling metabolism and development will function best at optimum temperatures which are externally defined for these ectotherms.

Temperatures for suitable Virginia beaches have not been sampled at the depth of sand that a natural nest would be found. Temperatures have been monitored in natural and artificially incubated loggerhead nests in Florida (McGehee, unpublished Master's Thesis, Univ. of Central Fla., 1979). The average sand temperature at nest depth on the beach one meter lateral to a nest was 27.8°C with a range from 27° to 29°C. An optimal temperature of 27°C was found for eggs incubated artificially at 20°, 24°, 27°, 30°, 32°, 35° and 38°C. Although we have no temperatures to compare directly, our contention is that the temperatures on Virginia's beaches are sufficient to hatch loggerhead nests as evidenced by the successful nest described in Number 4 below.

4. Primary evidence that Virginia's shores can adequately produce healthy hatchlings is shown by the one nest that was encountered this summer, transplanted to Back Bay NWR and successfully incubated and hatched under nearly natural conditions. Hatchling appearance occurred after 66 and 68 days of incubation.

Of the 104 eggs laid and then transplanted, 90 hatchlings were produced yielding a hatching success of 86.5%.

Caldwell (1959) tells of lengths of incubation for loggerhead eggs in natural nests at Cape Romain, S.C. from 49 to 62 days. Blanck and Sawyer (1981) state the mean incubation time for transplanted loggerhead nests at Ossabaw Island, GA. is 60 $\pm$ 10.2 days. The incubation time of 66-68 days for the Back Bay nest is near the natural time and within the range of observations of transplanted nests. The good hatching percentage achieved in this nest shows us that turtle eggs can get the balance of environmental conditions necessary for success on a Virginia beach.

In lieu of the evidence in favor of loggerhead nesting in Virginia, why isn't there an established chelonery here? Possibilities are the production of male-only clutches under minimum acceptable incubation temperatures, the lack of suitable refugia for the hatchling turtles when they leave the beaches, and the race against falling autumn temperatures during the first few months of life of the hatchlings.

Incubation temperature is known to affect the sex ratio of fresh water turtles (Pieau 1971, Yntema 1979) and *Caretta caretta* (Yntema and Mrosovsky 1979). The last authors found that eggs incubated 26° and 28°C produced all males, 30°C temperatures yielded an approximate 50-50 sex ratio and 32° and 34°C incubation gave all females. These findings resulted from laboratory incubation at controlled and even temperatures.

Temperatures under field conditions are neither controlled nor even, fluctuating slightly with diurnal period (although remarkably constant) and even more with climatic changes over the incubation period. The effects on sex ratio by fluctuating temperatures in natural nests or possible synergistic effects of temperature and other environmental parameters during incubation have not yet been elucidated. Nonetheless, cooler temperatures here at the northern end of the breeding range could be producing clutches of predominately male hatchlings and few or no females to return at maturity and lay their eggs on these shores.

When sea turtle hatchlings leave the nest and swim out to sea, they must run a gamut of predators including ghost crabs, sea gulls, pelagic birds, sharks, and many predatory fishes. For neonate loggerheads, the first year is spent at or near the surface. They have virtually no buoyancy control the first month and tend to pop up like corks when they dive according to Milsom (1975). He noted the ability to dive developed rapidly but at two to four months they had only limited control of buoyancy and full control did not develop until around eleven months of age. Presumably, the early diving ability is adaptive for both aerial predator avoidance and feeding while the neonates are "confined" to the surface.

Hatchlings have shown what has become known as "swimming-frenzy" (Carr 1967a); once they enter the water, hatchlings swim continuously for at least 24 hours (Frick 1976). Carr (1967b) says it is not known when some other navigation process may replace the tendency to swim away from the beach. He also notes that food and shelter will only be found in *Sargassum* rafts or debris during this pelagic phase. The *Sargassum* community is diverse and rich (Weis 1968, Fine 1970) in food items available to neonate sea turtles. Hatchling sea turtles have been reported in association with *Sargassum* rafts by Carr 1967a, Smith 1968, Caldwell 1969, and Witham 1974. Frick (1976) followed green turtle hatchlings from the beach and found that they tended to move directly from shore keeping on a straight course even when out of sight of land. Two of the samples she tracked encountered *Sargassum* and stopped to rest or explore. She suggested "the fundamental adaptive reason for the juvenile travel-drive may be, as has been suggested (by Carr, 1967 a&b), to reach longshore currents in which *Sargassum* rafts serve as a refuge and feeding place." Loggerhead hatchlings were tracked by Fletemeyer (1978) and found to stop in floating *Sargassum*. Four day old loggerheads he released near a weedline swam directly to the rafts and did not leave them during two hours of observation. Carr and Meylan (1980) found three green turtle hatchlings in only ten minutes of observation in well consolidated *Sargassum* rafts in a shear line 40 km off the coast of Panama. Carr states "the more or less consolidated alignment of rafts along inshore shears increased the probability that a hatchling will find refuge in the weed."

A problem for sea turtle hatchlings leaving Virginia's beaches is that there are no well developed rafts of *Sargassum* nearshore and the consolidation of such rafts along inshore shears is nonexistent. Other than occasional windblown patches and spotty, widely dispersed small clumps in the summer, *Sargassum* is not found off the coast of Virginia except near and in the Gulf Stream. Although the shortest route to the Gulf Stream from Virginia is southwesterly and is approximately 160 km from the southern border, the average position of the inner margin of the Stream is approximately 220 km due east of southern Virginia and 370 km due east in the north (Harrison et al. 1967). A hatchling would have a great distance of open ocean to cover before reaching suitable shelter and the longer he is thus exposed, the more likely he would fall to a predator.

Water temperatures just off Virginia fall from summer highs of 26°C or 27°C in August to below 20°C by mid-October, 15°C by November and below 10°C in winter. Declining air temperatures are much colder than water temperatures during the fall. Hatchlings that did encounter suitable *Sargassum* refugia drifting in the mid-Atlantic Bight would find shelter from predators but would be trapped by falling temperatures. Exposed portions of floating *Sargassum* die in air temperatures below 18°C, causing the plant mass to rotate with the heavier dead portions assuming deeper positions in the water and thus exposing living portions to the air (Parr, 1939). The cycle continues until sufficient quantities of the plant have succumbed to overcome the buoyancy of the living portions and the mass then sinks. This then would leave hatchling sea turtles associated with the *Sargassum* refugeless and exposed to predators and water temperatures rapidly dropping to levels that will immobilize the turtles and eventually kill them (Schwartz, 1978).

CONCLUSIONS

Loggerhead sea turtles are a regular and common component of Virginia's migratory fauna. Although conditions exist that can support successful nesting on the coast, the surveys have shown there is no major nesting activity on our beaches. Occasional nesting occurs but we are beyond the periphery of the normal breeding range. We conclude that this may be due to a combination of less than optimal temperatures during and after incubation and the lack of suitable refugia for neonatal hatchling protection.

SUMMARY

Loggerheads are common in Virginia's waters in the summers and occasional nests have been reported. Aerial examinations of suitable nesting beaches from May to August, 1981 revealed no nests made by sea turtles. Although loggerheads nest further north than any other sea turtle species, Virginia apparently is beyond the normal breeding range.

Evidence favorable for successful nesting in Virginia are:

1. The isolation and lack of human activity on the majority of the State's coastline;
2. Beach profiles and sand types similar to those found on beaches of the major cheloneries in the southeastern U.S.;
3. Temperatures favorable for successful incubation and hatching;
4. Evidence of a very successful nest at the Back Bay NWR which produced 90 hatchlings from 104 eggs buried.

Probable reasons that a chelonery has not become established here are:

1. Possible production of predominantly male hatchlings by less than optimal incubation temperatures;
2. The lack of suitable refugia (*Sargassum*) for neonate turtles in Virginia's nearshore and offshore waters;

3. Temperatures in the fall and early winter that can kill any *Sargassum* and hatchlings occuring in the mid-Atlantic Bight.

Virginia does not have a nesting population and those loggerheads nesting here should be considered extra-limital to the breeding range.

APPENDIX I

Historical Nesting Records

Records of Sea Turtle Nesting Activities

for the Virginia Atlantic Coast

I. Cape Henry and South

20 June 1970 - A nest of 132 loggerhead eggs was found at the south ramp of Back Bay NWR. The female turtle was estimated to weigh 400 pounds.

30 June 1970 - A nest of 87 loggerhead eggs was found at Sandbridge and transferred to Back Bay NWR. No hatching occurred.

June 1971 - Two loggerheads came ashore at Back Bay NWR but returned without nesting.

10 July 1971 - A loggerhead estimated at 250 pounds came ashore to nest but was scared off by vehicle headlights before completing the egg chamber.

26 July 1971 - A loggerhead was seen nesting at Virginia Beach. A clutch of 119 was transferred to Back Bay NWR. When no signs of hatching were seen, the nest was exhumed and all the eggs had been stolen.

15 August 1971 - A sea turtle estimated at 400 pounds came ashore, crawled to the dune line but was scared by a bystander with a flashlight and returned without nesting.

24 August 1972 - One loggerhead nest was examined south of Back Bay NWR (J. A. Musick, unpublished data).

11 August 1973 - A dead loggerhead hatchling was found at Sandbridge by a VIMS scientist (VIMS museum # RKD-37).

ca. 1 July 1979 - Turtle tracks were encountered at Back Bay NWR that did not result in a nest.

21 July 1979 - A nest of 131 loggerhead eggs 1 mile north of the southern Back Bay NWR boundary was exhumed and transferred to a protected location by FWS.

2 August 1979 - A nest of 147 loggerhead eggs was encountered near the southern Back Bay NWR boundary, exhumed and transferred to a protected location.

Late Summer, 1979 - A track was discovered in Sandbridge that did not result in a nest. Exact location and date not recorded.

25 July 1980 - A nest of 104 loggerhead eggs was exhumed and transferred from Sandbridge to Back Bay NWR.

II. Eastern Shore

Early 1920-'s - Recollections made by Granville Hogg, a Smith Island resident, of turtles as large as three feet in length that crawled out of the ocean in the summer to lay eggs on the beach. He also saw hatchlings crawl to the sea.

21 July 1974 - Nest at S. tip Assateague I. 115 eggs moved - all developed but died before pipping the eggs.

8 May 1975 - Tracks were encountered by a Botanist and two U.S.S.C.S. soil scientists. The tracks went inland from the beach surf line. Nesting unknown.

21 June 1975 - Nest on north beach Assateague I. Left in place. Tides flooded the nest and all the eggs rotted.

21 July 1975 - Nest on north beach Assateague I. Checked 10-8, dug up 11-5. Only 8 living, 4 badly deformed.

24 July 1975 - 3 crawls reported on Wallops I. nesting not known.

22 April 1976 - Virginia Marine Resources Commission pilot Jeff Walker noticed turtle tracks from the air on the Barrier Islands. Tracks weren't confirmed by foot.

29 July 1977 - Nest @ S. tip Assateague I moved to hatchery. Cool rains in August. Moved 110 inside (34 bad). Hatched 83 under 150 w bulb.

18 June 1979 - A loggerhead nest was discovered on North Parramore near Coast Guard Station. It is thought to have been dug up by predators later.

June 1979 - False crawl @ MD-VA line.

~ July 1979 - Nest at Wallops I. High tides inundated. Moved 2 days later 129 eggs - no hatch.

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