Attachment 6

UNITED STATES DEPARTMENT OF COMMERCE
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SEP 27 2002 F/SER3:DK:mdh

Mr. William H. Rogers
Natural Resources Manager
Marine Corps Air Station
PSC Box 8006
Cherry Point, NC 28533-0006

SUBJECT: Endangered Species Act Section 7 Consultation on Ongoing Ordnance Delivery at Marine Corps Air Station Cherry Point Bombing Target 9 and Bombing Target 11 in Pamlico Sound, North Carolina

Dear Mr. Rogers:

This document represents the National Marine Fisheries Service's (NOAA Fisheries) biological opinion (Opinion) based on our review of the activities to be conducted by the United States Marine Corps Air Station in Cherry Point, North Carolina (MCAS) and their effects on loggerhead turtles (*Caretta caretta*), Kemp's ridley turtles (*Lepidochelys kempii*), green turtles (*Chelonia mydas*), and leatherback turtles (*Dermochelys coriacea*). This Opinion has been prepared in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1536 *et seq.*). The NOAA Fisheries' consultation number for this action is F/SER/2002/00130. Please refer to this number in any future correspondence regarding this consultation.

This Opinion is based on information provided in a biological assessment prepared by the MCAS and received by NOAA Fisheries' Protected Resources Division on March 7, 2002, published and unpublished scientific information on the biology and ecology of threatened and endangered marine species within the action area, and other sources of information. A complete administrative record of this consultation is on file at the NOAA Fisheries' Southeast Regional Office in St. Petersburg, Florida. Comments received from MCAS regarding their review of a draft copy of the Opinion are addressed in the Consultation History section of the Opinion.

The Opinion states NOAA Fisheries' belief that the proposed action is not likely to jeopardize the continued existence of loggerhead, Kemp's ridley, green, or leatherback sea turtles. However, NOAA Fisheries anticipates incidental take of these species and has issued an Incidental Take Statement (ITS) pursuant to section 7 of the ESA. This ITS contains reasonable and prudent measures with implementing terms and conditions to help minimize this take.

If you have any questions, please contact Dennis Klemm, fishery biologist, at the number above or by e-mail at Dennis.Klemm@noaa.gov.

Sincerely,

for,

Joseph E. Powers, Ph.D.
Acting Regional Administrator

Enclosure

cc: F/PR3
F/SER41- R. Sechler

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Endangered Species Act - Section 7 Consultation
Biological Opinion

Action Agency: U.S. Marine Corps, Air Station Cherry Point

Activity: Ongoing Ordnance Delivery at Bombing Target 9 (BT-9) and Bombing Target 11 (BT-11) at Marine Corps Air Station, Cherry Point, North Carolina (Consultation No. F/SER/2002/00130)

Consultation Conducted By: National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida

Approved By: _____
Joseph E. Powers, Ph.D., Regional Administrator

Date Issued: SEP 27 2002

Consultation History

- On March 24, 2000, the National Marine Fisheries Service (NOAA Fisheries) sent the United States Marine Corps Air Station in Cherry Point, North Carolina (MCAS), a list of threatened and endangered species with the potential to occur in that area.

- On March 2, 2002, NOAA Fisheries' Southeast Regional Office, Protected Resources Division, received a letter from the MCAS with an attached biological assessment (BA) for the ongoing delivery of ordnance at BT-9 and BT-11. MCAS determined that there will be no effect on the blue (*Balaenoptera musculus*), finback (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales, nor on the hawksbill sea turtle (*Eretmochelys imbricata*) and shortnose sturgeon (*Acipenser brevirostrum*). A "may effect, but not likely to adversely affect" determination was made for the right whale (*Balaena glacialis*) and the leatherback sea turtle (*Dermochelys coriacea*). MCAS has determined that the inert ordnance activity is not likely to affect any listed species, but that ongoing, live ordnance delivery may affect, and is likely to adversely affect, loggerhead (*Caretta caretta*), green (*Chelonia mydas*), and Kemp's ridley (*Lepidochelys kempii*) sea turtles, thereby triggering formal consultation. NOAA Fisheries considers this letter and BA a complete consultation package.

- On July 25, 2002, MCAS sent a letter to NOAA Fisheries with concerns/comments stemming from their review of a draft copy of this biological opinion. The response to those comments are as follows:

> Comment 1 asked that the life span of the opinion be indefinite and that reinitiation occur only if one of the factors listed in the ESA implementing regulations (50 CFR 402.16(a)) triggers reinitiation. NOAA Fisheries decided to instead implement a 10-year life span for this Opinion. This decision is predicated on the fact that small changes in the action over time may not be deemed significant enough to result in reinitiation. However, those changes taken cumulatively may constitute a substantial change in the action. A re-evaluation by NOAA Fisheries after a

reasonable time frame is needed to ensure that necessary protections are provided as required by the ESA. This comment also requested that language in Section IV.A. of the draft opinion be revised to reflect the calculated take of 0.373 turtles. The calculated takes for direct hit by ordnance were reflected for each bombing target area. However, in the practical terms of expected takes, it has to be rounded up to one turtle, as a take of less than one turtle is not possible.

Comment 2 asked that the language in the Incidental Take Statement (ITS) be clarified that protection and Terms and Conditions only apply to ESA listed species and not species protected by the Marine Mammal Protection Act (MMPA). This language was changed and a paragraph was added stating the ITS does not cover MMPA issues and MCAS must consult separately on MMPA issues with the appropriate NOAA Fisheries' personnel.

Comment 3 questioned the inclusion of one sea turtle take as a result of boat strike over a 10-year period when MCAS considered the likelihood to be discountable. NOAA Fisheries feels that over any given year the likelihood may be discountable, but over a 10-year period, given the large amount of boat traffic associated with the action area, there is a non-discountable likelihood of a boat strike. As noted in the comment, the issuance of one take also provides some level of protection to MCAS in the unlikely event of such a take.

Comment 4 questioned the justification of suggesting continued water-quality testing as part of the Conservation Recommendations within the ITS because past testing did not demonstrate any concerns. Conservation Recommendations are non-binding recommendations. Although some limited water and sediment quality testing had been done, it could still potentially be an area of concern. In fact, in some areas sediment testing was not even undertaken because of the danger of unexploded ordnance, and enormous quantities of lead will no doubt accumulate in these areas over the years. NOAA Fisheries removed it as a stand-alone recommendation but then added to Conservation Recommendation 1 that if the area is no longer used for target practice and is opened for public use, water and sediment sampling should be performed prior to allowing public use of the area.

BIOLOGICAL OPINION

I. Description of Proposed Action

The Marine Corps manages two bombing targets (BT-9 and BT-11) in Pamlico Sound, N.C., for the purpose of training military personnel in the skill of ordnance delivery (by aircraft and occasionally small watercraft) at a target. Related actions in support of the ordnance delivery training include maintenance and replacement of targets on water and land and boat operations for personnel and equipment transport.

The BA submitted by the MCAS does not address impacts of flight operations themselves. These impacts for BT-9 and BT-11 have been previously addressed in the March 1998 *Final Environmental Impact Statement, Realignment of F/A-18 Aircraft and Operational Functions from Naval Air Station Cecil Field Florida, to other East Coast Installations,* and the April 1999 *Aircraft Noise Study for the Introduction of the V-22 to the 2nd MAW at Eastern North Carolina.* These two documents did not address the impacts of ordnance delivery.

BT-9 is used for various aircraft and small watercraft training in bombing techniques and target training. In this area both inert ordnance (practice bombs with no explosives) up to 2,000 pounds, and strafing and explosive ordnance (not to exceed 100 pounds TNT equivalent) are authorized for use. The actual target within the BT-9 range is a ship hull which is grounded on the Brant Island Shoal.

The BT-11 area is a multi-purpose complex with both land- and water-based targets including bulls eye, boat, simulated truck convoy, simulated train, simulated airstrip, strafing banner, and surface-to-air missile targets. The water-based targets are on the west side of Piney Island in Rattan Bay, and include a barge, PT boat, and remotely controlled boats. The complex is designed for both multiple aircraft and small watercraft strikes. Only inert ordnance is authorized on BT-11.

Further details on exact types, frequencies, and quantities of ordnance, as well as other detailed project information can be found in the *Biological Assessment for Ongoing Ordnance Delivery at Bombing Target 9 and Bombing Target 11* (MCAS 2001) which was reviewed for this Opinion. It is important to note, however, that all analyses provided in the BA are based upon what MCAS describes as a "typical amount of sorties over a year of operations" at the bombing targets. Normal year-to-year variation is not expected to cause a significant difference in the expected impacts at the action area. Should activities increase substantially in frequency or intensity, reinitiation would be required in order to consider the changed circumstances.

Action Area

The action area consists of two bombing target ranges, BT-9 and BT-11. These target ranges are located at the convergence of the Neuse River and Pamlico Sound in North Carolina. Pamlico Sound and its tributaries represent the second largest estuarine system in the United States, with the Neuse River providing the major source of freshwater inflow.

The range encompassing BT-9 is a circle with a 6 statute-mile diameter. This prohibited area is off limits to surface vessels, and is delineated by perimeter signs. The ship hull is replaced occasionally after damage from ordnance strikes has made it unuseable as a target. The replacement hull is placed directly over the site of the previous hull, if possible, otherwise it is placed directly to the side of the previous hull.

BT-11 includes both land and water areas encompassing a total of 12,500 acres. It is located in Carteret County, N.C., with the land portion on Piney Island. Within the overall BT-11, there are areas restricted as danger zones on both full-time and intermittent bases. The Rattan Bay target prohibited area includes approximately 2,300 acres of water.

Actions to reduce adverse effects

The MCAS incorporates specific procedures into their operations which help to minimize adverse effects to listed species. During practice runs, a target is declared foul if a protected species is sighted within 1,000 yards of the BT-9 target or anywhere within Rattan Bay. Operations may not commence until the animal(s) have moved outside of these ranges. It is also standard operating procedure for pilots to perform a visual check prior to ordnance delivery to determine if unauthorized civilian vessels or personnel, or protected species, are present. Pilots are directed to perform a low, cold (no ordnance

delivered) first pass. Prior to granting a "First Pass Hot" (use of ordnance) to the aircrew, range personnel make every attempt to clear the area via visual inspection and remotely operated camera operations. The Range Controller may deny or approve the First Pass Hot clearance as conditions warrant.

The remotely operated range cameras are high resolution and, according to range personnel, even allows them to clearly see a duck floating near the target. A newer, enhanced system with night vision capability is being installed at both BT-9 and BT-11. The cameras allow viewers to see animals at the surface and breaking the surface, but not underwater.

Search and rescue sweeps via helicopter are also undertaken every morning prior to the commencement of range operations. The primary goal of the sweep is to ensure that the target area is clear of fishermen or any other persons, but also incorporates a visual inspection for protected species. Sweeps are flown at 100-300 feet above the water surface at speeds of 60-100 knots. The crews can communicate directly with the range personnel, allowing immediate notification if the target area is not clear.

II. Status of Listed Species and Critical Habitat

Much of the information for this section, as well as additional detailed information relating to the species biology, habitat requirements, threats, and recovery objectives can be found in the recovery plan for each species (see "References Cited" section).

The following listed species under the jurisdiction of NOAA Fisheries are known to occur in or near the action area:

Threatened

Loggerhead sea turtle	*Caretta caretta*

Endangered

Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's ridley sea turtle	*Lepidochelys kempii*
Green sea turtle	*Chelonia mydas**
Blue whale	*Balaenoptera musculus*
Finback whale	*Balaenoptera physalus*
Humpback whale	*Megaptera novaeangliae*
Sei whale	*Balaenoptera borealis*
Right whale	*Balaena glacialis*
Sperm whale	*Physeter macrocephalus*
Shortnose sturgeon	*Acipenser brevirostrum*

**Green sea turtles in U.S. Atlantic waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green sea turtles are considered endangered wherever they occur in U.S. waters.*

The blue, finback, humpback, sei, and sperm whales, hawksbill sea turtle, and shortnose sturgeon are not expected to be affected by activities conducted at the project site. The whales are very large animals that prefer deeper, oceanic waters and are highly unlikely to occur in the shallow action area. An exception to this is the right whale, which has been reported in inland waters, albeit infrequently, and therefore the potential for impact will be addressed. Reported shortnose sturgeon populations in North Carolina are restricted to the Cape Fear River and the western part of Albemarle Sound. There have been no reports of shortnose sturgeon from the Pamlico, Pungo, and Neuse rivers. Since this species is not known to occur in the study area, it is extremely unlikely that this species would be affected. The hawksbill sea turtle is not known to nest or feed in the project area, and population survey and stranding data support the assertion that they do not occur in that area except in very rare instances.

A. Species/critical habitat description

Northern Right Whale

The Northern Atlantic right whale is listed as endangered under the ESA, and has a population estimate of only around 300 individuals for the western North Atlantic (IWC 2001). Although the Northern right whale is known to prefer coastal areas, the areas around BT-9 and BT-11 do not provide suitable habitat for regular use by the whales. The areas are too shallow for the whales to inhabit regularly and no record exists of right whales having passed through the action area. In addition to the very low likelihood of occurrence, the actions to reduce adverse effects as detailed above would make an interaction with a right whale extremely unlikely. As a result, NOAA Fisheries feels that the Northern right whale is not likely to be adversely affected by these activities and it will not be evaluated further in this document.

Loggerhead Sea Turtle

The loggerhead sea turtle was listed as a threatened species in 1978. This species inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian oceans, and within the continental United States it nests from Louisiana to Virginia. The major nesting areas include coastal islands of Georgia, South Carolina, and North Carolina, and the Atlantic and Gulf coasts of Florida, with the bulk of the nesting occurring on the Atlantic coast of Florida. Developmental habitat for small juveniles are the pelagic waters of the North Atlantic and the Mediterranean Sea.

There is no critical habitat designated for the loggerhead sea turtle.

Green Sea Turtle

Federal listing of the green sea turtle occurred on July 28, 1978, with all populations listed as threatened except for the Florida and Pacific coast of Mexico breeding populations which are endangered. The complete nesting range of the green turtle within the NOAA Fisheries' Southeast Region includes sandy beaches of mainland shores, barrier islands, coral islands, and volcanic islands between Texas and North Carolina and at the U.S. Virgin Islands (U.S.V.I.) and Puerto Rico (NMFS and USFWS 1991a). Principal U.S. nesting areas for green turtles are in eastern Florida, predominantly Brevard through Broward counties (Ehrhart and Witherington 1992). Regular green turtle nesting also occurs on St Croix, U.S.V.I., and on Vieques, Culebra, Mona, and the main island of Puerto Rico (Mackay and Rebholz 1996, Diez pers. comm.).

Critical habitat for the green sea turtle has been designated for the waters surrounding Isla Culebra, Puerto Rico, and its associated keys.

Kemp's Ridley Sea Turtle

The Kemp's ridley was listed as endangered on December 2, 1970. Internationally, the Kemp's ridley is considered the most endangered sea turtle (Zwinenberg 1977, Groombridge 1982). Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico, Tamaulipas State. The species occurs mainly in coastal areas of the Gulf of Mexico and the northwestern Atlantic Ocean. Occasional individuals reach European waters (Brongersma 1972). Adults of this species are usually confined to the Gulf of Mexico, although adult-sized individuals sometimes are found on the Eastern Seaboard of the United States.

There is no designated critical habitat for the Kemp's ridley sea turtle.

Leatherback Sea Turtle

The leatherback was listed as endangered on June 2, 1970. Leatherbacks are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic, Pacific, and Indian oceans; the Caribbean Sea; and the Gulf of Mexico (Ernst and Barbour 1972). Adult leatherbacks forage in temperate and subpolar regions from 71°N to 47°S latitude in all oceans and undergo extensive migrations between 90°N and 20°S, to and from the tropical nesting beaches. In the Atlantic Ocean, leatherbacks have been recorded as far north as Newfoundland, Canada, and Norway, and as far south as Uruguay, Argentina, and South Africa (see NMFS SEFSC 2001). Female leatherbacks nest from the southeastern United States to southern Brazil in the western Atlantic and from Mauritania to Angola in the eastern Atlantic. The most significant nesting beaches in the Atlantic, and perhaps in the world, are in French Guiana and Suriname (see NMFS SEFSC 2001).

Critical habitat for the leatherback includes the waters adjacent to Sandy Point, St. Croix, U.S.V.I.

B. Life history

Loggerhead Sea Turtle

Mating takes place in late March-early June, and eggs are laid throughout the summer, with a mean clutch size of 100-126 eggs in the southeastern United States. Individual females nest multiple times during a nesting season, with a mean of 4.1 nests/nesting individual (Murphy and Hopkins 1984). Nesting migrations for an individual female loggerhead are usually on an interval of 2-3 years, but can vary from 1-7 years (Dodd 1988). Loggerhead sea turtles originating from the western Atlantic nesting aggregations are believed to lead a pelagic existence in the North Atlantic Gyre for as long as 7-12 years or more, but there is some variation in habitat use by individuals at all life stages. Turtles in this life history stage are called "pelagic immatures." Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they begin to recruit to coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic and Gulf of Mexico.

Benthic immature loggerheads, the life stage following the pelagic immature stage, have been found from Cape Cod, Massachusetts, to southern Texas, and occasionally strand on beaches in northeastern Mexico.

Large benthic immature loggerheads (70-91 cm) represent a larger proportion of the strandings and in-water captures (Schroeder et al. 1998) along the southern and western coasts of Florida as compared with the rest of the coast, which could indicate that the larger animals are either more abundant in these areas or just more abundant within the area relative to the smaller turtles. Benthic immature loggerheads foraging in northeastern U.S. waters are known to migrate southward in the fall as water temperatures cool (Epperly et al. 1995b, Keinath 1993, Morreale and Standora 1999, Shoop and Kenney 1992), and migrate northward in spring. Past literature gave an estimated age at maturity of 21-35 years (Frazer and Ehrhart 1985, Frazer et al. 1994) and the benthic immature stage as lasting at least 10-25 years. However, NMFS SEFSC (2001) reviewed the literature and constructed growth curves from new data, estimating ages of maturity ranging from 20-38 years and benthic immature stage lengths from 14-32 years.

Juveniles are omnivorous and forage on crabs, mollusks, jellyfish, and vegetation at or near the surface (Dodd 1988). Sub-adult and adult loggerheads are primarily coastal and typically prey on benthic invertebrates such as mollusks and decapod crustaceans in hard bottom habitats.

Green Sea Turtle

Green sea turtle mating occurs in the waters off the nesting beaches. Each female deposits 1-7 clutches (usually 2-3) during the breeding season at 12-14 day intervals. Mean clutch size is highly variable among populations, but averages 110-115. Females usually have 2-4 or more years between breeding seasons, while males may mate every year (Balazs 1983). After hatching, green sea turtles go through a post-hatchling pelagic stage where they are associated with drift lines of algae and other debris.

Green turtle foraging areas in the southeast United States include any neritic waters having macroalgae or sea grasses near mainland coastlines, islands, reefs, or shelves, and any open-ocean surface waters, especially where advection from wind and currents concentrates pelagic organisms (Hirth 1997, NMFS and USFWS 1991). Principal benthic foraging areas in the region include Aransas Bay, Matagorda Bay, Laguna Madre, and the Gulf inlets of Texas (Doughty 1984, Hildebrand 1982, Shaver 1994), the Gulf of Mexico off Florida from Yankeetown to Tarpon Springs (Caldwell and Carr 1957, Carr 1984), Florida Bay and the Florida Keys (Schroeder and Foley 1995), the Indian River Lagoon System, Florida (Ehrhart 1983), and the Atlantic Ocean off Florida from Brevard through Broward counties (Wershoven and Wershoven 1992, Guseman and Ehrhart 1992). Adults of both sexes are presumed to migrate between nesting and foraging habitats along corridors adjacent to coastlines and reefs. Age at sexual maturity is estimated to be between 20 to 50 years (Balazs 1982, Frazer and Ehrhart 1985).

Green sea turtles are primarily herbivorous, feeding on algae and sea grasses, but also occasionally consume jellyfish and sponges. The post-hatchling, pelagic-stage individuals are assumed to be omnivorous, but little data are available.

Kemp's Ridley Sea Turtle

Remigration of females to the nesting beach varies from annually to every 4 years, with a mean of 2 years (TEWG 1998). Nesting occurs from April into July and is essentially limited to the beaches of the western Gulf of Mexico, near Rancho Nuevo in southern Tamaulipas, Mexico. The mean clutch size for Kemp's ridleys is 100 eggs/nest, with an average of 2.5 nests/female/season.

Juvenile/subadult Kemp's ridleys have been found along the Eastern Seaboard of the United States and in the Gulf of Mexico. Atlantic juveniles/subadults travel northward with vernal warming to feed in the productive, coastal waters of Georgia through New England, returning southward with the onset of winter to escape the cold (Lutcavage and Musick 1985, Henwood and Ogren 1987, Ogren 1989). In the Gulf, juvenile/subadult ridleys occupy shallow, coastal regions. Ogren (1989) suggested that in the northern Gulf they move offshore to deeper, warmer water during winter. Studies suggest that subadult Kemp's ridleys stay in shallow, warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud 1995). Little is known of the movements of the post-hatching, planktonic stage within the Gulf. Studies have shown the post-hatchling pelagic stage varies from 1-4 or more years, and the benthic immature stage lasts 7-9 years (Schmid and Witzell 1997). The TEWG (1998) estimates age at maturity to range from 7-15 years.

Stomach contents of Kemp's ridleys along the lower Texas coast consisted of a predominance of nearshore crabs and mollusks, as well as fish, shrimp, and other foods considered to be shrimp fishery discards (Shaver 1991). Pelagic stage, neonatal Kemp's ridleys presumably feed on the available sargassum and associated infauna or other epipelagic species found in the Gulf of Mexico.

Leatherback Sea Turtle

Female leatherbacks nest from the southeastern United States to southern Brazil in the western Atlantic and from Mauritania to Angola in the eastern Atlantic, with nesting occurring as early as late February or March. When they leave the nesting beaches, leatherbacks move offshore but eventually utilize both coastal and pelagic waters. Very little is known about the pelagic habits of the hatchlings and juveniles, and they have not been documented to be associated with the sargassum areas as are other species. Leatherbacks are deep divers, with recorded dives to depths in excess of 1,000 m (Eckert et al. 1989), but they may come into shallow waters if there is an abundance of jellyfish nearshore.

Although leatherbacks are a long-lived species (> 30 years), they are somewhat faster to mature than loggerheads. Leatherbacks have an estimated age at sexual maturity reported of about 13-14 years for females, with 9 years reported as a likely minimum (Zug 1996) and 19 years as a likely maximum (NMFS SEFSC 2001). They nest frequently (up to 7 nests per year) during a nesting season and nest about every 2-3 years. During each nesting, they produce 100 eggs or more in each clutch and, thus, can produce 700 eggs or more per nesting season (Schultz 1975).

Leatherback sea turtles feed primarily on jellyfish as well as cnidarians and tunicates. They are also the most pelagic of the turtles, but have been known to enter coastal waters on a seasonal basis to feed in areas where jellyfish are concentrated.

C. Population dynamics, status, and distribution

Loggerhead Sea Turtle

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian oceans and are the most abundant species of sea turtle occurring in U.S. waters. Loggerhead sea turtles concentrate their nesting in the north and south temperate zones and subtropics, but generally avoid nesting in tropical areas of Central America, northern South America, and the Old World (Magnuson et al. 1990).

In the western Atlantic, most loggerhead sea turtles nest from North Carolina to Florida and along the Gulf coast of Florida. There are 5 western Atlantic subpopulations, divided geographically as follows: (1) a northern nesting subpopulation, occurring from North Carolina to northeast Florida at about 29° N (approximately 7,500 nests in 1998); (2) a south Florida nesting subpopulation, occurring from 29° N on the east coast to Sarasota on the west coast (approximately 83,400 nests in 1998); (3) a Florida Panhandle nesting subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida (approximately 1,200 nests in 1998); (4) a Yucatán nesting subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Márquez 1990) (approximately 1,000 nests in 1998) (TEWG 2000); and (5) a Dry Tortugas nesting subpopulation, occurring in the islands of the Dry Tortugas, near Key West, Florida (approximately 200 nests per year) (NMFS SEFSC 2001). Natal homing of females to the nesting beach provides the barrier between these subpopulations, preventing recolonization with turtles from other nesting beaches.

Based on the data available, it is difficult to estimate the size of the loggerhead sea turtle population in the United States or its territorial waters. There is, however, general agreement that the number of nesting females provides a useful index of the species' population size and stability at this life stage. Nesting data collected on index nesting beaches in the United States from 1989-1998 represent the best data set available to index the population size of loggerhead sea turtles. However, an important caveat for population trends analysis based on nesting beach data is that this may reflect trends in adult nesting females but not reflect overall population growth rates. Given this caveat, between 1989 and 1998, the total number of nests laid along the U.S. Atlantic and Gulf coasts ranged from 53,014 to 92,182 annually, with a mean of 73,751. On average, 90.7% of these nests were from the south Florida subpopulation, 8.5% were from the northern subpopulation, and 0.8% were from the Florida Panhandle nest sites. There is limited nesting throughout the Gulf of Mexico west of Florida, but it is not known to which subpopulation the turtles making these nests belong.

The number of nests in the northern subpopulation from 1989 to 1998 was 4,370 to 7,887, with a 10-year mean of 6,247 nests. With each female producing an average of 4.1 nests in a nesting season, the average number of nesting females per year in the northern subpopulation was 1,524. The total nesting and non-nesting adult female population is estimated as 3,810 adult females in the northern subpopulation (TEWG 1998, 2000). The northern population, based on number of nests, has been classified as stable or declining (TEWG 2000). Another consideration adding to the vulnerability of the northern subpopulation is that NOAA Fisheries' scientists estimate that the northern subpopulation produces 65% males, while the south Florida subpopulation is estimated to produce 80% females (NMFS SEFSC 2001).

The southeastern U.S. nesting aggregation is of great importance on a global scale and is second in size only to the nesting aggregation on islands in the Arabian Sea off Oman (Ross 1979, Ehrhart 1989, NMFS and USFWS 1991b). The global importance of the southeast U.S. nesting aggregation is especially important because the status of the Oman colony has not been evaluated recently, but it is located in an area of the world where it is highly vulnerable to disruptive events such as political upheavals, wars, catastrophic oil spills, and lack of strong protections (Meylan et al. 1995).

Ongoing threats to the western Atlantic populations include incidental takes from dredging, commercial trawling, longline fisheries, and gillnet fisheries; loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and disease.

Green Sea Turtle

The vast majority of green turtle nesting within the southeast United States occurs in Florida. In Florida from 1989-1999, green turtle abundance from nest counts ranges 109-1,389 nesting females per year (Meylan et al. 1995 and Florida Marine Research Institute Statewide Nesting 2001 Database, unpublished data; estimates assume 4 nests per female per year, Johnson and Ehrhart 1994). High biennial variation and a predominant 2-year re-migration interval (Witherington and Ehrhart 1989, Johnson and Ehrhart 1994) warrant combining even and odd years into 2-year cohorts. This gives an estimate of total nesting females that ranges 705-1,509 during the period 1990-1999. It is important to note that because methodological limitations make the clutch frequency number (4 nests/female/year) an underestimate (by as great as 50%), a more conservative estimate is 470-1,509 nesting females in Florida between 1990 and 1999. In Florida during the period 1989-1999, numbers of green turtle nests by year show no trend. However, odd-even year cohorts of nests do show a significant increase during the period 1990-1999 (Florida Marine Research Institute, 2001 Index Nesting Beach Survey Database).

It is unclear how greatly green turtle nesting in the whole of Florida has been reduced from historical levels (Dodd 1981), although one account indicates that nesting in Florida's Dry Tortugas may now be only a small fraction of what it once was (Audubon 1926). Total nest counts and trends at index beach sites during the past decade suggest that green turtles that nest within the southeast United States are recovering and have only recently reached a level of approximately 1,000 nesting females. There are no reliable estimates of the number of green turtles inhabiting foraging areas within the southeast United States, and it is likely that green turtles foraging in the region come from multiple genetic stocks. These trends are also uncertain because of a lack of data. However, there is one sampling area in the region with a large time series of constant turtle-capture effort that may represent trends for a limited area within the region. This sampling area is at an intake canal for a power plant on the Atlantic coast of Florida where 2,578 green turtles have been captured during the period 1977-1999 (FPL 2000). At the power plant, the annual number of immature green turtle captures (minimum straight-line carapace length < 85 cm) has increased significantly during the 23-year period.

Status of immature green turtles foraging in the southeast United States might also be assessed from trends at nesting beaches where many of the turtles originated, principally, Florida, Yucatán, and Tortuguero. Trends at Florida beaches are presented above. Trends in nesting at Yucatán beaches cannot be assessed because of irregularity in beach survey methods over time. Trends at Tortuguero (ca. 20,000-50,000 nests/year) show a significant increase in nesting during the period 1971-1996 (Bjorndal et al. 1999).

The principal cause of past declines and extirpations of green turtle assemblages has been the over-exploitation of green turtles for food and other products. Although intentional take of green turtles and their eggs is not extensive within the southeast United States, green turtles that nest and forage in the region may spend large portions of their life history outside the region and outside United States jurisdiction, where exploitation is still a threat. Adult green turtles and immatures are exploited heavily on foraging grounds off Nicaragua and to a lesser extent off Colombia, Mexico, Panama, Venezuela, and the Tortuguero nesting beach (Carr et al. 1978, Nietschmann 1982, Bass et al. 1998, Lagueux 1998).

There are significant and ongoing threats to green turtles from human-related causes. Threats to nesting beaches in the region include beach armoring, erosion control, artificial lighting, and disturbance, which can be expected to increase with time. Pollution is known to have both direct (ingestion of foreign

materials such as tar balls and plastics) and indirect (degradation of foraging grounds) impacts on green sea turtles. Foraging habitat loss also occurs as a result of direct destruction by dredging, siltation, boat damage, and other human activities. Green turtles are often captured and occasionally killed by interactions with fishing gear. Collisions with power boats and encounters with suction dredges have killed green turtles along the U.S. coast and may be common elsewhere where boating and dredging activities are frequent (Florida Marine Research Institute, Sea Turtle Stranding and Salvage Network Database). Threats from increasing incidences of disease, which may or may not have some relation to human influences, are also a concern. The occurrence of green turtle fibropapillomatosis disease was originally reported in the 1930s, when it was thought to be rare (Smith and Coates 1938). Presently, this disease is cosmopolitan and has been found to affect large numbers of animals in some areas, including Hawaii and Florida (Herbst 1994, Jacobson 1990, Jacobson et al. 1991).

Kemp's Ridley Sea Turtle

L. kempii has a very restricted distribution relative to the other sea turtle species. Data suggests that adult Kemp's ridley turtles are restricted somewhat to the Gulf of Mexico in shallow nearshore waters, and benthic immature turtles of 20-60 cm straight line carapace length are found in nearshore coastal waters including estuaries of the Gulf of Mexico and the Atlantic, although adult-sized individuals sometimes are found on the Eastern Seaboard of the United States. The post-pelagic stages are commonly found dwelling over crab-rich sandy or muddy bottoms. Juveniles frequent bays, coastal lagoons, and river mouths.

Of the seven extant species of sea turtles in the world, the Kemp's ridley has declined to the lowest population level. Most of the population of adult females nest on the Rancho Nuevo beaches (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s. Recent observations of increased nesting suggest that the decline in the ridley population has stopped and the population is now increasing.

The TEWG (1998) identified three population trends in benthic immature ridleys. Benthic immatures are not yet reproductively mature but have recruited to feed in the nearshore benthic environment, where they are exposed to nearshore mortality sources that often result in strandings. Increased production of hatchlings from the nesting beach beginning in 1966 resulted in an increase in benthic ridleys that leveled off in the late 1970s. A second period of increase followed by leveling occurred between 1978 and 1989 as hatchling production was further enhanced by the cooperative program between the U.S. Fish and Wildlife Service and Mexico's Instituto Nacional de Pesca to increase the nest protection and relocation program in 1978. A third period of steady increase, which has not leveled off to date, has occurred since 1990 and appears to be due to the greatly increased hatchling production and an apparent increase in survival rates of immature turtles beginning in 1990, due in part to the introduction of turtle excluder devices (TEDs) in the U.S. and Mexican shrimping fleets. Adult ridley numbers have now grown, as shown in nesting increases at the main nesting sites in Mexico. Nesting at Tamaulipas and Veracruz increased from a low of 702 nests in 1985, to 1,930 nests in 1995, to 6,277 nests in 2000 (USFWS 2000). The population model used by the TEWG (1998) projected that Kemp's ridleys could reach the intermediate recovery goal identified in the Recovery Plan, of 10,000 nesters by the year 2020 if the assumptions of age to sexual maturity and age specific survivorship rates used in their model are correct.

The largest contributor to the decline of the ridley in the past was commercial and local exploitation, especially poaching of nests at the Rancho Nuevo site, as well as the Gulf of Mexico trawl fisheries. The advent of TED regulations for trawlers and protections for the nesting beaches have allowed the species to begin to rebound. Many threats to the future of the species remain, including interactions with fishery gear, marine pollution, foraging habitat destruction, illegal poaching of nests and potential threats to the nesting beaches from such sources as global climate change, development, and tourism pressures.

Leatherback Sea Turtle

Leatherbacks are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour 1972). The leatherback is the largest living turtle and it ranges farther than any other sea turtle species, exhibiting broad thermal tolerances (NMFS and USFWS 1995). Genetic analyses of leatherbacks to date indicate that within the Atlantic basin significant genetic differences occur among St. Croix (U.S. Virgin Islands), and mainland Caribbean populations (Florida, Costa Rica, Suriname/French Guiana) and between Trinidad and the mainland Caribbean populations (Dutton et al. 1999) leading to the conclusion that there are at least three separate subpopulations of leatherbacks in the Atlantic.

Nest counts are the only reliable population information available for leatherback turtles. Recent declines have been seen in the number of leatherbacks nesting worldwide (NMFS and USFWS 1995). A population estimate of 34,500 females (26,200-42,900) was made by Spotila et al. (1996), who stated that the species as a whole was declining and local populations were in danger of extinction. Historically, it was due primarily to intense exploitation of the eggs (Ross 1979) but adult mortality has increased significantly from interactions with fishery gear (Spotila et al. 1996). The Pacific population is in a critical state of decline, now estimated to number less than 3,000 total adult and subadult animals (Spotila et al. 2000). The status of the Atlantic population is less clear. In 1996, it was reported to be stable, at best (Spotila et al. 1996), but numbers in the western Atlantic at that time were reported to be on the order of 18,800 nesting females. According to Spotila (pers. comm.), the western Atlantic population currently numbers about 15,000 nesting females, whereas current estimates for the Caribbean (4,000) and the eastern Atlantic, off Africa, (numbering ca. 4,700) have remained consistent with numbers reported by Spotila et al. in 1996.

The nesting aggregation in French Guiana has been declining at about 15% per year since 1987. From 1979-1986, the number of nests was increasing at about 15% annually. The number of nests in Florida and the U.S. Caribbean has been increasing at about 10.3% and 7.5%, respectively, per year since the early 1980s but the magnitude of nesting is much smaller than that along the French Guiana coast (see NMFS SEFSC 2001). In summary, the conflicting information regarding the status of Atlantic leatherbacks makes it difficult to conclude whether or not the population is currently in decline. Numbers at some nesting sites are up, while at others they are down.

Zug (1996) pointed out that the combination of the loss of long-lived adults in fishery-related mortality (especially entanglement in gear and drowning in trawls), and the lack of recruitment stemming from elimination of annual influxes of hatchlings because of intense egg harvesting, has caused the sharp decline in leatherback populations. Other important ongoing threats to the population include pollution, loss of nesting habitat, and boat strikes.

D. Analysis of the species/critical habitat likely to be affected

Of the above listed species occurring in the action area, NOAA Fisheries believes that Kemp's ridley, loggerhead, green, and leatherback sea turtles are likely to be adversely affected by the proposed action, but no critical habitat for any species will be impacted. These four species are known to occur in the action area and the likelihood of them being impacted by the activities in the action area is not discountable. Hawksbill sea turtles and shortnose sturgeon may be affected, but are very rare, or undocumented, in the vicinity of the action area, and therefore they are not likely to be adversely affected. With the exception of the right whale, the listed whale species mentioned above do not occur in the shallow, nearshore waters of Pamlico Sound, and therefore the project will have no effect on these species. The right whale is known to utilize nearshore waters and has been documented in Pamlico Sound on rare occasions. The waters in the action area, however, are very shallow, and no valuable right whale habitat is present. The actions, detailed previously, to reduce adverse effects, and the low likelihood of a right whale occurring in the action area, leads NOAA Fisheries to conclude that the project may affect, but is not likely to adversely affect, the right whale.

III. Environmental Baseline

This section contains an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and ecosystem, within the action area. The environmental baseline is a snapshot of a species' health at a specified point in time and includes state, tribal, local, and private actions already affecting the species, or that will occur contemporaneously with the consultation in progress. Unrelated Federal actions affecting the same species or critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are Federal and other actions within the action area that may benefit listed species or critical habitat.

The environmental baseline for this Opinion includes the effects of several activities that affect the survival and recovery of threatened and endangered species in the action area. The activities that shape the environmental baseline in the action area of this consultation are primarily fisheries and recovery activities associated with reducing fisheries impacts. Other environmental impacts include effects of discharges, dredging, military activities, and industrial cooling water intake.

A. Status of the species within the action area

The four species of sea turtles that occur in the action area are all highly migratory. NOAA Fisheries believes that no individual members of any of the species are likely to be year-round residents of the action area. Individual animals will make migrations into nearshore waters as well as other areas of the North Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Therefore, the range-wide status of the four species of sea turtles, given in Section II above, most accurately reflects the species' status within the action area.

The loggerhead sea turtles in the action area are likely to represent differing proportions of the five western North Atlantic subpopulations, as well as unidentified subpopulations from the eastern Atlantic. This Opinion considers these subpopulations for the analysis, with particular emphasis on the northern subpopulation of loggerhead sea turtles. Although the northern subpopulation produces about 9% of the loggerhead nests, it comprises more of the loggerhead sea turtles found in foraging areas from the northeastern United States to Georgia. Between 24% and 46% of the loggerhead sea turtles in that area

are from the northern subpopulation (NMFS SEFSC 2001, Bass et al. 1998, Norrgard 1995, Rankin-Baransky 1997, Sears 1994, Sears et al. 1995).

B. Factors affecting species environment within the action area.

As explained above, sea turtles found in the action area are not year-round residents of the area, and may travel widely throughout the Atlantic, Gulf of Mexico, and Caribbean Sea. Therefore, individuals found in the action area (Pamlico Sound) can potentially be affected by activities anywhere else within this wide range.

Federal Actions

In recent years, NOAA Fisheries has undertaken several ESA section 7 consultations to address the effects of federally-permitted fisheries and other Federal actions on threatened and endangered species. Each of those consultations sought to develop ways of reducing the probability of adverse effects of the action on sea turtles. Similarly, recovery actions NOAA Fisheries has undertaken under the ESA are addressing the problem of take of sea turtles in the fishing and shipping industries. The following summary of anticipated sources of incidental take of turtles includes only those Federal actions which have undergone formal section 7 consultation.

Potential adverse effects from Federal vessel operations in the action area and throughout the range of sea turtles include operations of the Navy (USN) and Coast Guard (USCG), the Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA), and the Army Corps of Engineers (COE). NOAA Fisheries has conducted formal consultations with the USCG, the USN, and NOAA on their vessel operations. Through the section 7 process, where applicable, NOAA Fisheries has and will continue to establish conservation measures for all these agency vessel operations to avoid or minimize adverse effects to listed species. At the present time, however, they represent potential for some level of interaction.

In addition to vessel operations, other military activities including training exercises and ordnance detonation also affect sea turtles. Consultations on individual activities have been completed, but no formal consultation on overall USCG or USN activities in any region has been completed at this time.

The construction and maintenance of Federal navigation channels has also been identified as a source of turtle mortality. Hopper dredges move relatively rapidly (compared to sea turtle swimming speeds) and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. A regional biological opinion (RBO) with the COE has been completed for the southeast Atlantic waters and the Gulf of Mexico. Consultation on a new RBO for the COE's Gulf of Mexico hopper dredging operations is currently underway.

The COE and Minerals Management Service (MMS) (the latter is non-military) oil and gas exploration, well development, production, and abandonment/rig removal activities also adversely affect sea turtles. Both of these agencies have consulted with NOAA Fisheries on these types of activities.

Adverse effects on threatened and endangered species from several types of fishing gear occur in the action area. Efforts to reduce the adverse effects of commercial fisheries are addressed through the ESA section 7 process. Gillnet, longline, trawl gear, and pot fisheries have all been documented as interacting

with sea turtles. For all fisheries for which there is a Federal fishery management plan (FMP) or for which any Federal action is taken to manage that fishery, impacts have been evaluated under section 7. Several formal consultations have been conducted on the following fisheries that NOAA Fisheries has determined are likely to adversely affect threatened and endangered species: American lobster, monkfish, dogfish, southeastern shrimp trawl fishery, northeast multispecies, Atlantic pelagic swordfish/tuna/shark, and summer flounder/scup/black sea bass fisheries.

On June 14, 2001, NOAA Fisheries issued a jeopardy opinion for the Highly Migratory Species (HMS) fisheries off the eastern United States. The HMS Opinion found that the continued prosecution of the pelagic longline fishery in the manner described in the HMS FMP was likely to jeopardize the continued existence of loggerhead and leatherback sea turtles. This determination was made by analyzing the effects of the fishery on sea turtles in conjunction with the environmental baseline and cumulative effects. The environmental baseline section of the HMS Opinion is incorporated herein by reference and can be found at the following NOAA Fisheries' website:

http://www.nmfs.noaa.gov/prot_res/readingrm/ESAsec7/HMS060801final.pdf

The environmental baseline for the June 14, 2001, HMS Opinion also considered the impacts from the North Carolina offshore spring monkfish gillnet fishery and the inshore fall southern flounder gillnet fishery, both of which were responsible for large numbers of sea turtle mortalities in 1999 and 2000, especially loggerhead sea turtles. However, during the 2001 season NOAA Fisheries implemented an observer program that observed 100 % of the effort in the monkfish fishery, and then in 2002 a rule was enacted creating a seasonal monkfish gillnet closure along the Atlantic coast based upon sea surface temperature data and turtle migration patterns. In 2001 NOAA Fisheries also issued an ESA section 10 permit with mitigative measures for the southern flounder fishery. Subsequently the sea turtle mortalities in these fisheries were drastically reduced. The reduction of turtle mortalities in these fisheries reduces the negative effects these fisheries have on the environmental baseline.

NOAA Fisheries has implemented a reasonable and prudent alternative (RPA) in the HMS fishery which would allow the continuation of the pelagic longline fishery without jeopardizing the continued existence of loggerhead and leatherback sea turtles. The provisions of this RPA include the closure of the Grand Banks region off the northeast United States and gear restrictions that are expected to reduce the by-catch of loggerheads by as much as 76% and leatherbacks by as much as 65%. Further, NOAA Fisheries is implementing a major research project to develop measures aimed at further reducing longline by-catch. The implementation of this RPA reduces the negative effects that the HMS fishery has on the environmental baseline. The conclusions of the June 14, 2001, HMS Opinion and the subsequent implementation of the RPA are hereby incorporated into the environmental baseline section of this Opinion.

Another action with Federal oversight which has impacts on sea turtles is the operation of electrical generating plants. Sea turtles entering coastal or inshore areas have been affected by entrainment in the cooling-water systems of electrical generating plants. Biological opinions have already been written for a number of electrical generating plants, and others are currently undergoing section 7 consultation.

State or Private Actions

Commercial traffic and recreational pursuits can have an adverse effect on sea turtles through propeller and boat strike damage. Private vessels participate in high speed marine events concentrated in the southeastern United States and are a particular threat to sea turtles, and occasionally to marine mammals as well. The magnitude of these marine events is not currently known. NOAA Fisheries and the USCG are in early consultation on these events, but a thorough analysis has not been completed.

Various fishing methods used in state fisheries, including trawling, pot fisheries, fly nets, and gillnets are known to cause interactions with sea turtles. Georgia and South Carolina prohibit gillnets for all but the shad fishery. Florida has banned all but very small nets in state waters, as has Texas. Louisiana, Mississippi, and Alabama have also placed restrictions on gillnet fisheries within state waters such that very little commercial gillnetting takes place in southeast waters, with the exception of North Carolina. Most pot fisheries in the Southeast are prosecuted in areas frequented by sea turtles.

Strandings in the North Carolina area represent, at best, 7%-13% of the actual nearshore mortality (Epperly et al. 1996). Studies by Bass et al. (1998), Norrgard (1995), and Rankin-Baransky (1997) indicate that the percentage of northern loggerheads in this area is highly over-represented in the strandings when compared to the approximately 9% representation from this subpopulation in the overall U.S. sea turtle nesting populations. Specifically, the genetic composition of sea turtles in this area is 25%-54% from the northern subpopulation, 46%-64% from the South Florida subpopulation, and 3%-16% from the Yucatán subpopulation. The cumulative removal of these turtles on an annual basis would severely impact the recovery of this species.

Other Potential Sources of Impacts in the Environmental Baseline

A number of activities that may indirectly affect listed species include discharges from wastewater systems, dredging, ocean dumping and disposal, and aquaculture. The impacts from these activities are difficult to measure. Where possible, however, conservation actions are being implemented to monitor or study impacts from these elusive sources.

NOAA Fisheries and the USN have been working cooperatively to establish a policy for monitoring and managing acoustic impacts from anthropogenic sound sources in the marine environment. Acoustic impacts can include temporary or permanent injury, habitat exclusion, habituation, and disruption of other normal behavior patterns.

Conservation and Recovery Actions Shaping the Environmental Baseline

NOAA Fisheries implemented a series of regulations aimed at reducing potential for incidental mortality of sea turtles in commercial fisheries. In particular, NOAA Fisheries has required the use of TEDs in southeast U.S. shrimp trawls since 1989 and in summer flounder trawls in the mid-Atlantic area (south of Cape Charles, Virginia) since 1992. It has been estimated that TEDs exclude 97% of the turtles caught in such trawls. These regulations have been refined over the years to ensure that TED effectiveness is maximized through proper placement and installation, configuration (e.g., width of bar spacing), floatation, and more widespread use. Recent analyses by Epperly and Teas (1999) indicate that the minimum requirements for the escape opening dimensions are too small, and that as many as 47% of the loggerheads stranding annually along the Atlantic seaboard and Gulf of Mexico were too large to fit

through existing openings. On October 2, 2001, NOAA Fisheries published a proposed rule to require larger escape openings in TEDs and is planning to publish a final rule in 2002.

In 1993 (with a final rule implemented 1995), NOAA Fisheries established a Leatherback Conservation Zone to restrict shrimp trawl activities from the coast of Cape Canaveral, Florida, to the North Carolina/Virginia border. This provides for short-term closures when high concentrations of normally pelagic-distributed leatherbacks are recorded in more coastal waters where the shrimp fleet operates. This measure is necessary because, due to their size, adult leatherbacks are larger than the escape openings of most NOAA Fisheries-approved TEDs.

NOAA Fisheries is also working to develop a TED which can be effectively used in a type of trawl known as a fly net, which is sometimes used in the mid-Atlantic and northeast fisheries to target sciaenids and bluefish. Limited observer data indicate that takes can be quite high in this fishery. A prototype design has been developed, but testing under commercial conditions is still necessary.

In addition, NOAA Fisheries has been active in public outreach efforts to educate fishermen regarding sea turtle handling and resuscitation techniques. As well as making this information widely available to all fishermen, NOAA Fisheries recently conducted a number of workshops with longline fishermen to discuss bycatch issues including protected species, and to educate them regarding handling and release guidelines. NOAA Fisheries intends to continue these outreach efforts and hopes to reach all fishermen participating in the pelagic longline fishery over the next one to two years. There is also an extensive network of Sea Turtle Stranding and Salvage Network participants along the Atlantic and Gulf of Mexico which not only collects data on dead sea turtles, but also rescues and rehabilitates any live stranded turtles.

Efforts to enhance water quality has been enacted in North Carolina. The Clean Water Responsibility and Environmentally Sound Policy Act, signed by North Carolina's governor on August 26, 1997, puts a moratorium on hog farms, requires comprehensive planning across the state to ensure clean water, gives counties the right to zone large hog farms, and restricts where hog farms can be built. The new law also tightens limits on the amount of nitrogen that cities and industries can discharge into nutrient sensitive waters, requires additional storm water controls, and authorizes studies of water pollution. There is also the Lower Cape Fear River Program which is a collaboration among academia, government, industry, and the public. This is a large-scale water quality assessment program covering estuaries and a large portion of the lower watershed.

IV. Effects of the Action

A. Factors considered and analyses for effects of the action

- **Sediment disturbance** could potentially impact listed species by disturbing individuals and/or their prey, reducing water quality, and reducing habitat quality through siltation. Sediments in the action area are primarily hard or firmly packed sands, which experience only minimal disturbance and quick settlement. The MCAS performed turbidity testing in 1991 shortly following a bombing exercise and found turbidity to remain far below the state water quality requirement of 25 NTU. Sediment disturbance is not expected to affect listed species for this project.

- **Lighting effects** from the project are expected to be minimal. There are no nesting beaches in the vicinity of the action area. Flares are utilized during the training operations but illumination is brief and occurs at high altitudes.

- **Debris ingestion and entanglement** is an ongoing threat to sea turtles and marine mammals. Debris from the operations include parachutes from flares, chaff strands from flares, and wires from TOW missiles. None of the above item types have been documented to be ingested by sea turtles or marine mammals. The flare parachutes are made for one-time use, and according to MCAS observations do not persist long in the environment. Chaff strands are too fine to block the digestive tract, and are non-toxic. NOAA Fisheries has evaluated the potential for harm as a result of incidental ingestion of chaff by sea turtles. Based upon information provided in the BA and consultation with veterinary scientists, NOAA Fisheries has concluded that there is not a significant or measurable likelihood of harm as a result of chaff fibers which fall into the waters during training exercises, nor from other debris (flare parachutes, etc.) that are left in the water following each exercise.

- **Airborne emissions** from the project are not expected to have an impact on listed species. Airborne emission modeling was performed for a much larger project (the DDG-81 Winston S. Churchill ship shock trials) which involved predicting emissions from a 10,000-lb charge. Based upon various health and safety standards, the models predicted that there would be no risk to humans or marine life in the test area from the Churchill testing using a total of 40,000 lbs of charges. The project evaluated in this Opinion will use much smaller quantities of charges, and airborne emissions are not anticipated to affect any marine species.

- **Waterborne emissions** are not expected to have an impact on listed species. The State of North Carolina, Department of Environment and Natural Resources expressed concern in the past about the possible effects of the actions on water quality. A water quality sampling plan was enacted for pH, conductivity, turbidity, temperature, dissolved oxygen, nine soluble metals (copper, zinc, iron, aluminum, chromium, magnesium, nickel, lead, and silver), sulfate, sulfide, ammonia, and volatile and semi-volatile organics. Sediment sampling was performed at BT-11 only because BT-9 has the potential of encountering unexploded ordnance in the sediments. All tested parameters were within the limits set by North Carolina Water Quality Standards for Saltwater Classification (for those parameters with standards).

- **Target establishment/maintenance** occurs infrequently. MCAS personnel are required to ensure that new targets are free of environmental contaminants prior to placing them in the water for use. There is little potential for these activities to impact listed species.

- **Boat operations** have the potential to impact sea turtles or marine mammals by striking the animal. MCAS manned boats have no greater chance of striking an animal than does a recreational boat, and remote controlled boats follow a fairly limited path that does not pass through any habitat that would be especially likely to concentrate or attract animals. Although the likelihood is small, the frequency of MCAS boat traffic through the area does create a situation where a sea turtle can potentially be struck. NOAA Fisheries, therefore, determined that up to one turtle of any species may be struck within a 10-year period by MCAS boats.

- **Direct hits by ordnance** are another potential source of take occurring as a result of the MCAS training activities. Modeling was done for the ranges to determine the total surface area needed to contain

99.99% of initial and ricochet impacts (95% confidence interval) for each aircraft and ordnance type. The impact area data was used in conjunction with seasonal maximum sea turtle density data for the area from Epperly et al. (1995a and 1995b), shell surface area averages for the turtles, and ordnance drop data to determine that over a 10-year period ordnance direct impacts could account for 0.206 turtles at BT-9 and 0.167 at BT-11. A detailed explanation of the method used to determine these numbers can be found in the MCAS BA for this project. Based on the above calculations and rounding up to a whole turtle, NOAA Fisheries determined that up to a total of one turtle of any species may be impacted by direct hit from ordnance over a 10-year period.

- **Concussive effects from live ordnance explosions** can range from brief acoustic and tactile effects leading to physical discomfort, to lethal and non-lethal injuries. Non-lethal injuries include slight, recoverable injury to internal organs and/or the auditory system. Lethal injuries would result from massive trauma as a result of close proximity to a detonation. A very detailed explanation of the modeling performed to determine the expected impacts to marine mammals can be found in the BA for this project. Information about impacts to the auditory system causing temporary threshold shifts (TTS) are based upon studies of marine mammals because of the lack of sea turtle data on that subject. Sea turtles are, however, generally accepted to be much less susceptible to auditory damage than marine mammals, and therefore the models may be very conservative and overestimate the impact to sea turtles. The models used data on sea turtle densities, impact area and intensity of the explosives, and frequency of ordnance delivery to determine that up to 3 turtles could die from extensive lung hemorrhage, up to 1 could suffer slight (recoverable) lung injury, and no more than 21 should experience disruption of hearing-based behaviors as a result of TTS. NOAA Fisheries has reviewed and accepted the expected impacts determined by the model.

B. Species' response to the proposed action

The proposed action is not expected to have a significant effect on any of the sea turtle species. Of the total expected take, the vast majority (21) are temporary in the form of disruption of hearing-based behaviors/disorientation from TTS, and one is from recoverable, slight lung injury. There is no year-round population in the action area, and therefore any impacts will be spread out amongst the population as a whole. The action area is not known to be a breeding or nesting area, and therefore disturbances are not likely to result in a reduction of reproduction. No critical habitat for any species will be impacted.

V. Cumulative Effects

Cumulative effects are the effects of future state, local, or private activities that are reasonably certain to occur within the action area or within the range of sea turtles. Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Within the action area, major future changes are not anticipated in the ongoing human activities described in the environmental baseline. The present, major human uses of the action area are expected to continue at the present levels of intensity in the near future. Listed species of turtles, however, migrate throughout the Atlantic Ocean and Gulf of Mexico and may be affected during their life cycles by non-Federal activities outside the action area.

Beachfront development, lighting, and beach erosion control all are ongoing activities along the Atlantic and Gulf coasts. These activities potentially reduce or degrade sea turtle nesting habitats or interfere with hatchling movement to sea. Nocturnal human activities along nesting beaches may also discourage sea turtles from nesting sites. The extent to which these activities reduce sea turtle nesting and hatchling production is unknown. However, as conservation awareness spreads, more and more coastal cities and counties are adopting more stringent measures to protect hatchling sea turtles from the disorienting effects of beach lighting.

State-regulated commercial and recreational fishing activities in Atlantic Ocean and Gulf of Mexico waters currently result in the incidental take of threatened and endangered species. It is expected that states will continue to license/permit large vessel and thrill-craft operations which do not fall under the purview of a Federal agency, and issue regulations that will affect fishery activities. Any increase in recreational vessel activity in inshore and offshore waters of the Gulf of Mexico and Atlantic Ocean will likely increase the number of turtles taken by injury or mortality in vessel collisions. Recreational hook-and-line fisheries have been known to lethally take sea turtles. Future cooperation between NOAA Fisheries and the states on these issues should help decrease take of sea turtles caused by recreational activities. NOAA Fisheries will continue to work with coastal states to develop and refine ESA section 6 agreements and section 10 permits to enhance programs to quantify and mitigate these takes.

VI. Conclusion

After reviewing the current status of the endangered green, leatherback, and Kemp's ridley sea turtles, and the threatened loggerhead sea turtle in the action area, the environmental baseline, the effects of the proposed action, and the cumulative effects, it is NOAA Fisheries' biological opinion that the proposed action is not likely to jeopardize the continued existence of the endangered green turtle, leatherback turtle, Kemp's ridley turtle, nor the threatened loggerhead turtle. No critical habitat has been designated for these species in the action area; therefore, none will be affected.

Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the MCAS for the exemption in section 7(o)(2) to apply. MCAS has a continuing duty to regulate the activity covered by this incidental take statement. If MCAS fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, MCAS must report the progress of the action and its impact on the species to NOAA Fisheries as specified in the incidental take statement.

Incidental takes of any marine mammals are not authorized under this ITS. If the MCAS believes such takes may occur, an incidental take authorization under Marine Mammal Protection Act (MMPA) Section 101 (a)(5) is necessary. In this regard, please contact Ken Hollingshead of our Headquarters Protected Resources staff at (301) 713-2055.

Amount or Extent of Anticipated Take

Based on stranding records and historical data, four species of sea turtles (loggerhead, green, Kemp's ridley, and leatherback) are known to occur in the action area. Based upon maximum density estimates of the turtle species in Pamlico Sound, estimates of total ordnance quantities to be delivered during a year, and intensity of live ordnance explosions provided by MCAS, NOAA Fisheries has determined that there is a quantifiable expected impact to sea turtles in the area as a result of the bombing range activities. Therefore, pursuant to section 7(b)(4) of the ESA, NOAA Fisheries anticipates an incidental take as follows:

- 1 take (injury or mortality) over a 10-year period of any sea turtle species by boat impact.
- 1 take (injury or mortality) of any sea turtle species by direct hit from ordnance over a 10-year period from the date of this Opinion.
- 3 takes (mortality by extensive lung hemorrhage, etc.) per year as a result of concussive force injury from the explosion of live ordnance. Only one may be a Kemp's ridley, and one a leatherback, with the remaining being any combination of the other two species.
- 1 take of any species per year in the form of slight (recoverable) lung or other injury as a result of the concussive force of live ordnance explosions.
- 21 takes of any species per year in the form of disruption of hearing-based behaviors/disorientation as a result of temporary threshold shift in hearing from the concussive force of live ordnance explosions.

If the actual incidental take meets or exceeds any of these levels, MCAS must immediately reinitiate formal consultation.

Effect of the Take

In the accompanying biological opinion NOAA Fisheries determined that the aforementioned level of anticipated take (lethal, or non-lethal) is not likely to appreciably reduce either the survival or recovery of Kemp's ridley, green, loggerhead, or leatherback sea turtles in the wild by reducing their reproduction, numbers, or distribution. The activity, therefore, is not likely to result in jeopardy to any of the above mentioned species. The project area has no designated critical habitat for any of the sea turtles, and therefore will not cause an adverse modification of critical habitat.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the Kemp's ridley, green, loggerhead, and leatherback sea turtles and to ensure no take of other species protected by the ESA under NOAA Fisheries' purview.

1. The MCAS shall have measures in place to limit the potential for interactions with ESA-listed species as a result of the proposed action.

2. The MCAS shall report all interactions with any ESA-listed species resulting from the proposed action.

3. The MCAS shall have measures in place to aid any individuals of an ESA-listed species which has been impacted by MCAS activities and is in a condition requiring assistance to enhance likelihood of survival.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, MCAS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The MCAS must fully incorporate all of the "actions to reduce adverse effects" as proposed in the BA and described earlier in this Opinion.

2. The MCAS must have field staff trained to identify, measure, and resuscitate sea turtles (resuscitation guidelines attached), and they shall also check for and record external flipper tags. The MCAS staff will record the date, time, location, species, sex, straight and curved carapace measurements, condition, and final disposition of any turtles taken as a result of this activity. The MCAS staff will also tag all live turtles with external flipper tags, and will bring dead turtles to the North Carolina Wildlife Resources Commission for postmortem examination.

3. The MCAS must survey the training area immediately after an exercise has been completed to determine whether any protected animals have been injured or killed. Injured and/or unconscious animals must be rescued, and dead animals must be retrieved. Animals requiring resuscitation must be resuscitated and released per the attached resuscitation guidelines. Rescue and rehabilitation of injured animals must be in cooperation with appropriate

agencies/organizations qualified to provide care for the animals.

4. The MCAS must send a report detailing any take of sea turtles or other protected species to NOAA Fisheries, Assistant Regional Administrator for Protected Resources, Southeast Regional Office, within 14 days of the incident (F/SER3, 9721 Executive Center Drive North, St. Petersburg, Florida 33702). This report will contain all of the information required in Terms and Conditions 2 above.

NOAA Fisheries anticipates that no more than: 1 take (injury or mortality) per year of any sea turtle species by boat impact; 1 take (injury or mortality) of any sea turtle species by direct hit from ordnance over a 10-year period; 3 takes (mortality by extensive lung hemorrhage, etc.) per year as a result of concussive force injury from the explosion of live ordnance (only one being a Kemp's ridley, with the other two being any combination of the remaining three species); 1 take per year in the form of slight (recoverable) lung or other injury as a result of the concussive force of live ordnance explosions; and 21 takes per year in the form of disruption of hearing-based behaviors/disorientation as a result of temporary threshold shift in hearing from the concussive force of live ordnance explosions. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If during the course of the action this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. MCAS must immediately request initiation of formal consultation, provide an explanation of the causes of the taking, and review the need for possible modification of the reasonable and prudent measures. In addition, NOAA Fisheries emphasizes that all analyses provided in the BA and used for this Opinion are based upon current, average activities in the action area. Normal year-to-year variation is not expected to cause a significant difference in the expected impacts. If activities increase substantially in frequency or intensity, however, it would constitute a change in project scope and reinitiation would be required in order to consider the changed circumstances.

IX. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat to help implement recovery plans or to develop information.

1. At any point should the MCAS at Cherry Point cease being used for ordnance practice and the waters become open for public use, the MCAS should make all reasonable efforts to clean up accumulated lead (bullets, etc.), as well as unexploded ordnance in the aquatic substrates. Additionally, MCAS should conduct monitoring of water and sediment quality at the target sites prior to opening the area to public use.

2. MCAS should have personnel trained in PIT tagging so that any rescued turtles can be PIT tagged prior to release. MCAS should consider requesting a section 10 permit for PIT tagging rescued sea turtles. MCAS should also consider obtaining a PIT-tag reader so that rescued sea turtles can be scanned for the presence of PIT tags.

In order for NOAA Fisheries to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NOAA Fisheries requests notification of the implementation of any conservation recommendations.

X. Reinitiation of Consultation

This concludes formal consultation on the actions outlined in MCAS' letter and BA dated December, 2001. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of taking specified in the incidental take statement is met or exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat (when designated) in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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