Walton County and City of Destin Beach Restoration
Gulf of Mexico
Walton and Okaloosa Counties, Florida
Public Notice SAJ-2003-8314-IP-TLZ

Biological Opinion
April 30, 2004

Prepared by:
U.S. Fish and Wildlife Service
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United States Department of the Interior

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Comment [Comment1]: DON'T EDIT OR DELETE ABOVE THIS COMMENT

April 30, 2004

Colonel James G. May
Department of the Army
Jacksonville District Corps of Engineers
Panama City Regulatory Field Office
475 Harrison Avenue, Suite 202
Panama City, Florida 32401

Attn: Teresa L. Zar

Re: FWS No. 4-P-01-149
Public Notice SAJ-2003-8314-IP-TLZ
Date Started: November 26, 2003
Project Title: Walton County Destin Beach Restoration Project, Gulf of Mexico
Ecosystem: NE Gulf
County: Walton and Okaloosa Counties, Florida

Dear Colonel May:

Enclosed is the Fish and Wildlife Service's (Service) Biological Opinion (BO) for the Walton County and Destin Beach Restoration project along the Gulf of Mexico in Walton and Okaloosa counties, Florida, and its effects on endangered and threatened nesting sea turtles. The Service concurs that the proposed action would not likely adversely affect wintering piping plover and would not adversely modify designated critical habitat for the wintering piping plover. The Service has also determined that with the incorporation of conservation measures for manatees, the proposed action would not likely adversely affect the manatee. This opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.).

INTRODUCTION

This biological opinion is based on information provided in the Public Notice, by your agency, the applicant's consultant, Taylor Engineering, Inc., the Service's participation on the South Walton Tourist Development Council's Beach Nourishment Committee as a technical advisor, participation on the Walton - Destin Technical Advisory Committee, other sources of information, numerous telephone discussions, and onsite observations. A complete administrative record of this consultation is on file in the Service's Panama City, Florida Field Office.

CONSULTATION HISTORY

November 1999 to present	The Service participates as a technical advisor to the South Walton Tourist Development Council Beach Nourishment Committee. Meetings are held once a month.
February 28, 2001	The Service participates as a member of the Walton - Destin Technical Advisory Committee for the project.
November 27, 2002	Taylor Engineering, Inc., the applicant's project consultant, submits a draft report detailing the method and findings of the project feasibility study.
March 13, 2003	FWS, Southeast Region Geologist, provides the Panama City Field Office with a review and comments on the project.
November 26, 2003	The Service receives a letter dated November 26, 2003, requesting initiation of formal section 7 consultation concerning endangered species. The Environmental Assessment is provided with the request for consultation.
December 2, 2003	The Service transmits a letter to the United States Corps of Engineers (Corps) acknowledging and concurring with the request for formal consultation.
January 5, 2004	The Service receives the public notice on the project.
January 28, 2004	The Service submits a draft biological opinion to the Corps, FWS, and the FWS National Sea Turtle Coordinator.
April 14, 2004	The Corps e-mails the Service that they concur with revised BO and to finalize the document.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The applicants, Walton County and the City of Destin (applicants) propose to restore a 6.7-mile stretch of beach along the Gulf of Mexico shoreline in the City of Destin, Okaloosa County and in Walton County. The project will be conducted between Florida Department of Environmental Protection (FDEP) reference monuments R-39 in Destin and R-21.93 (930 feet (ft)) in Walton County. Approximately 3,000,000 cubic yards of fill will be placed within the construction template, which covers 14,152,773 square feet (325 acres). The subaqueous portion of the project between the erosion control line (ECL) and the equilibrium toe of fill covers 20,592,595 square feet (473 acres). The borrow area for the material lies offshore East Pass of Choctawhatchee Bay, located approximately 9 miles west of the center of the project area. It is expected this one-time restoration project, in the absence of storm events, will maintain nearly 80 percent of the fill in the project area 10 years after placement (Taylor Engineering, Inc., 2003).

The construction profile consists of a 210-foot wide berm at an elevation of 8 feet National Geodetic Vertical Datum (NGVD) and a slope of 1:1 from the berm's seaward edge to the toe of fill. On average, the equilibrium profile has a 100-foot wide berm at an elevation of 8 feet NGVD. The eastern end (R-22 to R-23) of the project will include a 1000-foot taper that transitions to a 0-foot construction berm. The volume density of the beach fill design approaches 77 cubic yards per linear foot of beach.

The project also includes dune restoration, consisting of the placement of about 3 cubic yards per foot of sand in a dune feature with a nominal crest width of 20 feet at an elevation of 12 feet NGVD and a slope of 1:5 extending seaward to the beach fill berm elevation. The created dunes will be planted with appropriate native vegetation.

The operation schedule for the dredging and transfer of sand would be on a 24-hour/7-day a week schedule. It is expected that it would take 5 to 8 months to complete the project. The purpose of the project is to increase storm protection and restore the recreational capacity of the beach, to service visitors and residents of South Walton and South Okaloosa counties.

Conservation Measures

Incorporation of the Manatee Special Conservation Conditions.

a. All personnel associated with the project will be instructed about the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatee(s).

b. All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Manatee Sanctuary act of 1978. The applicants and/or contractor may be held responsible for any manatee harmed, harassed, or killed as a result of construction activities.

c. All vessels associated with the project shall operate at "no wake/idle" speeds at all times while in water where the draft of the vessel provides less than four feet clearance from the bottom and that vessels shall follow routes of deep water whenever possible.

d. If a manatee is sighted within 100 yards of the project area, all appropriate precautions shall be implemented to ensure protection of the manatee. These precautions shall include the operation of all moving equipment closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet of a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.

e. Any collision with and/or injury to a manatee shall be reported immediately to the "Manatee Hotline" at 1-800-DIAL-FMP (1-800-342-5367). Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Panama City (1-850-769-0552) northwest Florida.

Action Area

The Action Area under this consultation includes the beach from mean low water (MLW) to the crest of the primary dune or landward structure and is between FDEP monuments R-39 in Destin to R-23 in Walton County (Figure 1). The Action Area consists of suitable nesting habitat for sea turtles, thus activity in this area could impact nesting females, their nests and eggs, and any hatchlings, either in the nest or upon emergence from the nest and crawling to the Gulf of Mexico.

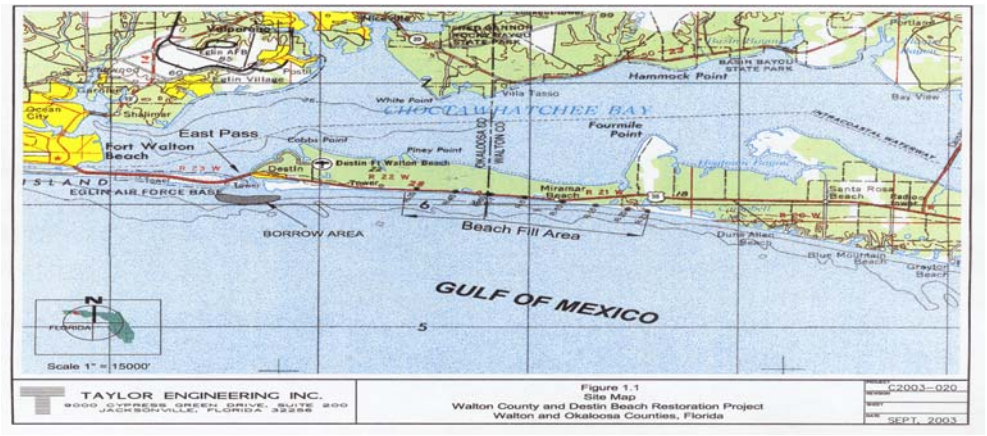


Figure 1: Location of the Walton County and Destin Beach Restoration Project, Walton and Okaloosa Counties, Florida

STATUS OF THE SPECIES/CRITICAL HABITAT

The Service has responsibility for implementing recovery of sea turtles when they come ashore to nest. The National Oceanic and Atmospheric Administration-Fisheries (NOAA-Fisheries) has jurisdiction over sea turtles in the marine environment. This biological opinion addresses nesting sea turtles and hatchlings only.

Four species of sea turtles are analyzed in this biological opinion: the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), the endangered leatherback sea turtle *(Dermochelys coriacea*), and the endangered Kemp's ridley sea turtle (*Lepidochelys kempii)*.

Species/critical habitat description

Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*) was federally listed as a threatened species throughout its range in the United States (U.S.) on July 28, 1978 (43 FR 32800). No critical habitat has been designated for the loggerhead sea turtle.

The loggerhead sea turtle grows to an average weight of about 200 pounds and is characterized by a large head with blunt jaws. The loggerhead feeds on mollusks, crustaceans, fish, and other marine animals.

The loggerhead sea turtle inhabits the continental shelves and estuarine environments along the margins in the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Major nesting beaches are located in the Sultanate of Oman, southeastern U.S., and eastern Australia. The species is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and ship wrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and often in association with other species of sea turtles.

Recovery Criteria for the United States

The southeastern U.S. population of the loggerhead can be considered for delisting where, over a period of 25 years, the following conditions are met:

1. The adult female population in Florida is increasing and in North Carolina, South Carolina, and Georgia, it has returned to pre-listing levels (NC - 800, SC - 10,000, and GA - 2,000 nests per season). The above conditions must be met with the data from standardized surveys which would continue for at least five years after delisting.

2. At least 25 percent (348 miles) of all available nesting beaches (1,400 miles) are in public ownership, distributed over the entire nesting range and encompassing at least 50 percent of the nesting activity in each state.

3. All priority one tasks identified in the recovery plan have been successfully implemented.

Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific Coast of Mexico are listed as endangered; all other populations are listed as threatened. Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys (50 CFR 226.72).

The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers. Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae.

The green sea turtle has a worldwide distribution in tropical and subtropical waters. They are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The sea turtle is attracted to lagoons and shoals with an abundance of marine grass and algae.

Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Open beaches with a sloping platform and minimal disturbance are required for nesting.

Recovery Criteria for the United States

The U.S. population of green sea turtles can be considered for delisting when, over a period of 25 years, the following conditions are met:

1. The level of nesting in Florida has increased to an average of 5,000 nests per year for at least six years. Nesting data must be based on standardized surveys.

2. At least 25 percent (65 miles) of all available nesting beaches (260 miles) are in public ownership and encompasse at least 50 percent of the nesting activity.

3. A reduction in stage class mortality is reflected in higher counts of individuals on foraging grounds.

4. All priority one tasks identified in the Recovery Plan have been successfully implemented.

Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*) was federally listed as an endangered species throughout its range in the U.S. on June 2, 1970 (35 FR 8491). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands (50 CFR 17.95). This is the largest, deepest diving, and most migratory and wide ranging of all sea turtle species. The adult leatherback can reach 4 to 8 feet in length and weigh 500 to 2,000 pounds. Jellyfish are the main staple of its diet, but it is also known to feed on sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

The leatherback sea turtle is distributed worldwide in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. Non-breeding leatherbacks have been recorded as far north as British Columbia, Newfoundland, the British Isles, and the Maritime Provinces of Canada and as far south as Argentina and the Cape of Good Hope (Pritchard, 1992).

Leatherback turtles nest on shores of the Atlantic, Pacific and Indian Oceans. Adult females require sandy nesting beaches backed with vegetation and sloped sufficiently so the distance to dry sand is limited. Their preferred beaches have proximity to deep water and generally rough seas.

Recovery Criteria for the United States

The U.S. population of leatherbacks can be considered for delisting when the following conditions are met:

1. The adult female population increases over the next 25 years, as evidenced by a statistically significant trend in the number of nests at Culebra, Puerto Rico, St. Croix, U.S. Virgin Island, and along the east coast of Florida.

2. Nesting habitat encompassing at least 75 percent of nesting activity in U.S. Virgin Islands, Puerto Rico, and Florida is in public ownership.

3. All priority one tasks identified in the recovery plan have been successfully implemented.

Kemp's Ridley Sea Turtle

The Kemp's ridley sea turtle (*Lepidochelys kempii*) was listed as endangered on December 2, 1970 (35 FR 18320). The range of the Kemp's ridley includes the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland. Most Kemp's ridleys nest on the coastal beaches of the Mexican states of Tamaulipas and Veracruz, although a very small number of Kemp's ridleys nest consistently along the Texas coast (Turtle Expert Working Group, 1998). In addition, rare nesting events have been reported in Florida, Alabama, South Carolina, and North Carolina. Hatchlings, after leaving the nesting beach, are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about 7.9 inches in length, at which size they enter coastal shallow water habitats (Ogren, 1989). Outside of nesting, adult Kemp's ridleys are believed to spend most of their time in the Gulf of Mexico, while juveniles and subadults also regularly occur along the eastern seaboard of the United States (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992).

No critical habitat has been designated for the Kemp's ridley sea turtle.

Recovery Criteria for the United States

The goal of the plan is the recovery of the population so that the species can be reduced from endangered to threatened status. The Recovery Team members feel that the criteria for a complete removal of this species from the endangered species list need not be considered now, but rather left for future revisions of the plan. Complete removal from the Federal list would certainly necessitate that some other instrument of protection, similar to the Marine Mammal Protection Act, be in place and be international in scope. Kemp's ridley can be considered for downlisting to threatened under the ESA when the following four criteria are met:

1. Protection of the known nesting habitat and the water adjacent to the nesting beach (concentrating on the Ranch Nuevo area) and continuation of the bi-national project,

2. Elimination of the mortality from incidental catch from commercial shrimping in the U.S. and Mexico through the use of Turtle Excluder Devices (TEDs) and full compliance with the regulations requiring TED use,

3. Attainment of a population of at least 10,000 females nesting in a season,

4. All priority one recovery tasks in the recovery plan are successfully implemented.

Life history (growth, life span, survivorship, and mortality)

Loggerhead Sea Turtle

Loggerheads are known to nest from one to seven times within a nesting season (Talbert *et al*., 1980; Richardson and Richardson, 1982; Lenarz et al., 1981; among others); the mean is about 4.1 times (Murphy and Hopkins, 1984). The interval between nesting events within a season varies around a mean of about 14 days (Dodd, 1988). Mean clutch size varies from about 100 to 126 eggs along the southeastern U.S. Coast (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991a). Nesting migration intervals of two to three years are most common in loggerheads, but the number can vary from one to seven years (Dodd, 1988). Age at sexual maturity is believed to be about 20 to 30 years (Turtle Expert Working Group, 1998).

Green Sea Turtle

Green turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3 clutches. The interval between nesting events within a season varies around a mean of about 13 days (Hirth, 1997). Mean clutch size varies widely among populations. Average clutch size was 136 eggs in 130 clutches for one beach in Florida (Witherington and Ehrhart, 1989). Only occasionally do females produce clutches in successive years. Usually two, three, four, or more years intervene between breeding seasons (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991b). Age at sexual maturity is believed to be about 20 to 50 years (Hirth, 1997).

Leatherback Sea Turtle

Leatherbacks nest an average of five to seven times within a nesting season, with an observed maximum of 11 (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1992). The interval between nesting events within a season is about nine to ten days. Clutch size averages 80 to 85 yolked eggs, with the addition of usually a few dozen smaller, yolkless eggs, mostly laid toward the end of the clutch (Pritchard, 1992). Nesting migration intervals of two to three years were observed in leatherbacks nesting on the Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands (McDonald and Dutton, 1996). Leatherbacks are believed to reach sexual maturity in six to ten years (Zug and Parham, 1996).

Kemp's Ridley Sea Turtle

Nesting occurs from April into July during which time the turtles appear off the Tamaulipas and Veracruz coasts of Mexico. Precipitated by strong winds, the females swarm to mass nesting emergences, known as *arribadas* or *arribazones*, to nest during daylight hours. Clutch size averages 100 eggs (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992). Some females breed annually and nest an average of 1 to 4 times in a season at intervals of 10 to 28 days. Age at sexual maturity is believed to be between 7 to 15 years (Turtle Expert Working Group, 1998).

Population dynamics

Loggerhead Sea Turtle

Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the Atlantic and Gulf coasts of Florida and on the coastal islands of North Carolina, South Carolina, and Georgia (Hopkins and Richardson, 1984). From a global perspective, the southeastern U.S. nesting aggregation is of primary importance to the survival of the species because it is second in size only to nesting on islands in the Arabian Sea of Oman (Ross,1982; Ehrhart, 1989; (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991a). The status of the Oman colony has not been evaluated recently, but its location in a part of the world that is vulnerable to disruptive events (e.g., political upheavals, wars, catastrophic oil spills) causes considerable concern (Meylan *et al*., 1995). The loggerhead nesting groups in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991a). Total estimated nesting in the southeastern U.S. is approximately 68,000 to 90,000 nests per year (Florida FWC statewide nesting database 2002; Georgia DNR statewide nesting database 2002; SCDNR statewide nesting database 2002; NCWRC statewide nesting database 2002). About 80 percent of loggerhead nesting in the southeastern U.S. occurs in six Florida Atlantic coast counties - Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991a).

Adult loggerheads are known to migrate long distances between foraging areas and nesting beaches. During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatán.

Most loggerhead hatchlings originating from U.S. beaches are believed to spend their time in the open ocean of the North Atlantic gyre for an extended period of time, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating in association with *Sargassum* rafts. Once they become juveniles, they begin migrating to coastal areas in the western Atlantic where they become bottom feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. These juveniles occupy coastal feeding grounds for a decade or more before maturing and making their first reproductive migration, the females returning to their birth beach to nest.

Green Sea Turtle

About 150 to 2,750 females are estimated to nest on beaches in the continental U.S. annually (FWC, 2003) producing 500 to 9,000 nests. In the U.S. Pacific, over 90 percent of nesting throughout the Hawaiian archipelago occurs at the French Frigate Shoals, where about 200 to 700 females nest each year. Elsewhere in the U.S. Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. In the western Pacific, the largest green turtle nesting group in the world occurs on Raine Island, Australia, where thousands of females nest nightly (Limpus et al., 1993). In the Indian Ocean, major nesting beaches occur in Oman where 30,000 females are reported to nest annually (Ross and Barwani, 1995).

Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991b). Nesting also has been documented along the Gulf coast of Florida from Escambia County through Franklin County and from Pinellas County through Collier County (Meylan *et al*., 1995; Brost 2003). The Florida green turtle nesting group is recognized as a regionally important colony. Green turtles have been known to nest in Georgia, but only on rare occasions (Winn, 1996). The green turtle also nests sporadically in North Carolina and South Carolina (Boettcher, 1998, 1996) and unconfirmed nests are reported in Alabama (Dailey, 1998).

Green turtles apparently have a strong nesting site fidelity and often make long distance migrations between feeding grounds and nesting beaches. Hatchlings have been observed to seek refuge and food in *Sargassum* rafts.

Leatherback Sea Turtle

Nesting grounds are distributed worldwide, with the Pacific coast of Mexico supporting the world's largest known concentration of nesting leatherbacks. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1992; National Research Council, 1990a).

Recent annual estimates of global nesting populations indicate 26,000 to 43,000 nesting females (Spotila *et al*., 1996). The current largest nesting populations occur in the western Atlantic in French Guiana (4,500 to 7,500 females nesting/year), Colombia (estimated several thousand nests annually), in the western Pacific in West Papua (formerly Irian Jaya), and Indonesia (about 600 to 650 females nesting/year).

In the U.S., small nesting populations occur on the Florida east coast (100 females/year) (Florida FWC, 2003), Sandy Point, U.S. Virgin Islands (50 to 190 females/year) (Alexander et al., 2002), and Puerto Rico (30 to 90 females/year). Leatherback turtles have been known to nest in Georgia, South Carolina, and North Carolina, but only on rare occasions (Murphy,1996; Winn, 1996; Boettcher, 1998). Leatherback nesting also has been reported on the northwest coast of Florida (LeBuff, 1976; Longieliere *et al*., 1997; Brost, 2003); and a false crawl (non-nesting emergence) has been observed on Sanibel Island in southwest Florida (LeBuff, 1990).

Kemp's Ridley Sea Turtle

The 40,000 nesting females estimated from a single mass nesting emergence in 1947 reflected a much larger total number of nesting turtles in that year than exists today (Carr, 1963; Hildebrand, 1963). However, nesting in Mexico has been steadily increasing in recent years -- from 702 nests in 1985 to over 6,000 nests in 2000. Despite protection for the nests, turtles have been and continue to be lost to incidental catch by shrimp trawls (U.S. Fish and Wildlife Service and National Marine Fisheries Service, 1992).

Status and distribution

Loggerhead Sea Turtles

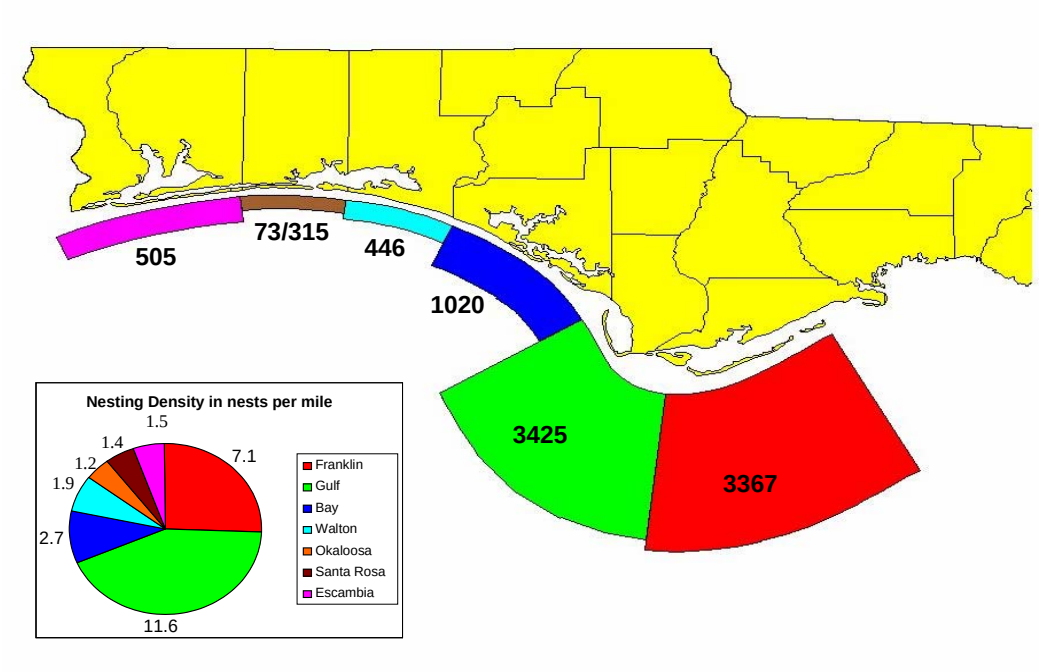
Genetic research involving analysis of mitochondrial DNA (mtDNA) has identified five different loggerhead nesting sub-populations in the western North Atlantic: (1) the Northern Sub-population occurring from North Carolina south to around Cape Canaveral, Florida (about 29^{o} N.); (2) South Florida Sub-population occurring from about 29^{o} N. on Florida's east coast to Sarasota on Florida's west coast; (3) Dry Tortugas, Florida, Sub-population; (4) Northwest Florida Sub-population occurring at Eglin Air Force Base and the beaches near Panama City; and (5) Yucatán Sub-population occurring on the eastern Yucatán Peninsula, Mexico (Bowen, 1994;

1995; Bowen *et al*., 1993; Encalada *et al*., 1998; Pearce, 2001). These data indicate that gene flow between these five regions is very low. If nesting females are extirpated from one of these regions, regional dispersal would not be sufficient to replenish the depleted nesting sub-population.

The Northern Sub-population has declined substantially since the early 1970's, but most of that decline occurred prior to 1979. No significant trend has been detected in recent years (Turtle Expert Working Group, 1998, 2000). Adult loggerheads of the South Florida Sub-population have shown significant increases over the last 25 years, indicating that the population is recovering, although a trend could not be detected from the State of Florida's Index Nesting Beach Survey program from 1989 to 1998. Nesting surveys in the Northwest Florida and Yucatán Sub-populations have been too irregular to date to allow for a meaningful trend analysis (Turtle Expert Working Group, 1998, 2000).

Loggerheads are the most common nesting sea turtle and account for over 99 percent of the sea turtle nests in northwest Florida. The eastern portion of the region has the majority of loggerhead nesting (Figure 2). The loggerhead sea turtle nesting and hatching season for the region extends between May 1 and November 30. The earliest nest of the season documented was on April 29 (St. Joseph Peninsula State Park) and the latest nest was on August 19 (Tyndall Air Force Base) (Brost, 2003). Nest incubation ranges from about 49 to 95 days.

Figure 2: Loggerhead sea turtle nesting in NW Florida, 1993-2002, Total Nests 9151



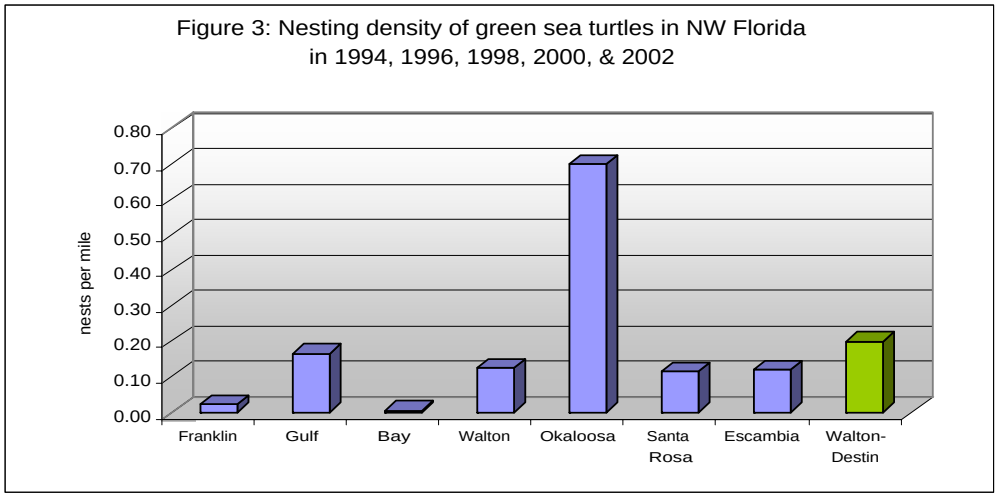
Threats to loggerhead sea turtles include incidental take from channel dredging and commercial trawling, longline and gill net fisheries, loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and disease. There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

In the southeastern U.S., major nest protection efforts and beach habitat protection are underway for most of the primary nesting areas, and progress has been made in reducing mortality from commercial fisheries in U.S. waters with the enforcement of turtle excluder device (TED) regulations. Many coastal counties and communities in Florida, Georgia, and South Carolina have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection. The migratory nature of loggerheads severely compromises these efforts once they move outside U.S. waters, however, because legal and illegal fisheries activities in some countries are causing high mortality on loggerhead sea turtle nesting populations of the western north Atlantic region. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations.

Green Sea Turtle

Total population estimates for the green turtle are unavailable, and trends based on nesting data are difficult to assess because of large annual fluctuations in numbers of nesting females. For instance, in Florida, where the majority of green turtle nesting in the southeastern U.S. occurs, estimates range from 200 to 1,100 females nesting annually. Populations in Surinam and Tortuguero, Costa Rica may be stable, but there is insufficient data for other areas to confirm a trend.

Green sea turtle nesting has been documented in all counties (but not on all beaches) in northwest Florida (Figure 3**)**. The green sea turtle nesting and hatching season for this region extends from May 15 through October 31, the earliest nest of the season was documented on May 20 (Santa Rosa Island) and the latest nest was documented on August 21 (Gulf Islands National Seashore). Nest incubation ranges from about 60 to 90 days. Nesting in northwest Florida has been consistently documented at least every other year since 1990 (Brost, 2003).



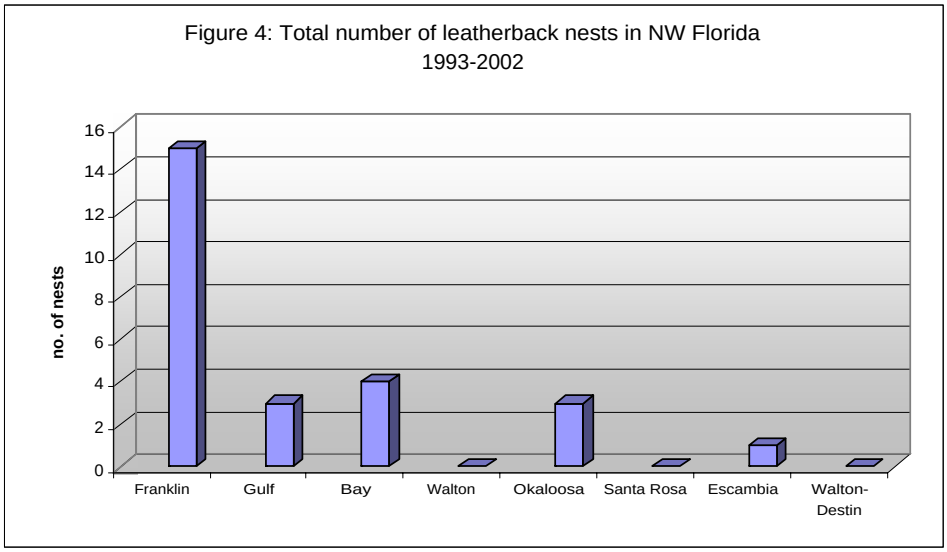
A major factor contributing to the green sea turtle's decline worldwide is commercial harvest for eggs and food. Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green turtle populations in Florida, Hawaii, and other parts of the world. The tumors interfere with swimming, eating, breathing, vision, and reproduction. Turtles with excessive tumors may die. Documented cases of fibropapillomatosis in northwest Florida are increasing (Redlow, 2004). Other threats include loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and incidental take from channel dredging and commercial fishing operations.

In the southeastern U.S., major nest protection efforts and beach habitat protection are underway at most of the larger nesting areas, and significant progress has been made in reducing mortality from commercial fisheries in U.S. waters with the enforcement of TED regulations. Many coastal counties and communities in Florida have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection. The Service and NOAA-Fisheries have been funding research on the fibropapilloma disease for several years to expand knowledge of the disease with the goal of developing an approach for remedying the problem. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations.

Leatherback Sea Turtle

Declines in leatherback nesting have occurred over the last two decades along the Pacific coasts of Mexico and Costa Rica. The Mexican leatherback nesting population, once considered to be the world's largest leatherback nesting population (65 percent of worldwide population), is now less than one percent of its estimated size in 1980. Spotila *et al*., (1996) recently estimated the number of leatherback sea turtles nesting on 28 beaches throughout the world from the literature and from communications with investigators studying those beaches. The estimated worldwide population of leatherbacks in 1995 was about 34,500 females on these beaches with a lower limit of about 26,200 and an upper limit of about 42,900. This is less than one third the 1980 estimate of 115,000. Leatherbacks are rare in the Indian Ocean and in very low numbers in the western Pacific Ocean. The largest population is in the western Atlantic. Using an age-based demographic model, Spotila *et al*., (1996) determined that leatherback populations in the Indian Ocean and western Pacific Ocean cannot withstand even moderate levels of adult mortality and that even the Atlantic populations are being exploited at a rate that cannot be sustained. They concluded that leatherbacks are on the road to extinction and further population declines can be expected unless action is taken to reduce adult mortality and increase survival of eggs and hatchlings.

Documented leatherback nests are rare in northwest Florida. From 1993 to 2002, a total of 26 nests have been reported on northwest Florida beaches: fifteen in Franklin County, four in Bay County, three in Okaloosa County, three in Gulf County, and one in Escambia County (Brost, 2003) (Figure 4). The first recorded leatherback nest in the region was in 1974, on St. Vincent Island, Franklin County. The majority of the nests have had low natural hatching success. The greatest number of successful nests in any one season occurred in 2000, when three leatherback nest were documented to produce hatchlings that successfully emerged from the nest. One nest was on the Ft. Pickens Unit of Gulf Islands National Seashore, Escambia County and two of the nests were on Eglin Air Force Base, Santa Rosa Island, Okaloosa County. The leatherback sea turtle nesting and hatching season for this region extends from late April through October 31. For confirmed nesting, the earliest nest was documented on April 14 (St. George Island) and the latest nest documented on July 24 (Tyndall Air Force Base). Documented nest incubation in northwest Florida ranges from about 63 to 84 days (Brost, 2003; Miller, 2001; Nicholas, 2001).



The decline of the Pacific leatherback population is believed primarily to be the result of exploitation by humans for the eggs and meat, as well as incidental take in numerous commercial fisheries of the Pacific. Other factors threatening leatherbacks globally include loss or degradation of nesting habitat from coastal development; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; and watercraft strikes.

It is crucial to maximize hatchling production for the remaining leatherback nesting that occurs along the extensive Pacific coasts of Mexico, Costa Rica, and other Central American countries. Due to the long range migratory movements of sea turtles between nesting beaches and foraging areas, long-term international cooperation is essential for recovery and stability of nesting populations. From 1998 to 1999, the Service provided annual funding to assist recovery efforts for the leatherback in Mexico and Costa Rica, including support for nesting surveys and nest protection. In the southeastern U.S. and U.S. Caribbean, major nest protection efforts and beach habitat protection are underway for most of the important nesting areas. In addition, research is underway to develop technologies to minimize leatherback mortality associated with the longline fishery.

Many coastal counties and communities have developed beachfront lighting ordinances to reduce hatchling disorientations. Important U.S. nesting beaches have been and continue to be acquired for long-term protection.

Kemp's Ridley Sea Turtle

Eleven ridley nests have now been documented in Florida in Volusia, Lee, Sarasota, Pinellas, and Escambia counties (Brost, 2003; Nicholas, 2000). Hatchlings, after leaving the nesting beach, are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about eight inches long, when they enter coastal shallow water habitats.

The decline of this species was primarily due to human activities, including the direct harvest of adults and eggs and incidental capture in commercial fishing operations. Today, under strict protection, the population appears to be in the early stages of recovery. The recent nesting increase can be attributed to full protection of nesting females and their nests in Mexico resulting from a bi-national effort between Mexico and the U.S. to prevent the extinction of the Kemp's ridley, and the requirement to use turtle excluder devices in shrimp trawls both in the United States and Mexico.

The Mexico government also prohibits harvesting and is working to increase the population through more intensive law enforcement, by fencing nest areas to diminish natural predation, and by relocating all nests into corrals to prevent poaching and predation. While relocation of nests into corrals is currently a necessary management measure, this relocation and concentration of eggs into a "safe" area is of concern since it makes the eggs more susceptible to reduced viability due to movement-induced mortality, disease vectors, catastrophic events like hurricanes, and marine predators once the predators learn where to concentrate their efforts.

Common threats to all sea turtles in Northwest Florida

Coastal Development

Loss of nesting habitat related to development of the coastline has had the greatest impact on nesting sea turtles in this region. Beachfront development not only causes the loss of suitable nesting habitat but can result in the disruption of powerful coastal processes accelerating erosion and interrupting the natural shoreline migration (National Research Council, 1990b). This may in turn cause the need to protect upland structures and infrastructure by armoring, groin placement, beach berm construction, and beach restoration/nourishment which may cause additional loss or impact to the remaining sea turtle habitat.

Hurricanes

A predominant threat to sea turtle nesting is tropical storms and hurricanes. In general, hurricanes result in severe erosion of the beach and dune systems. Overwash and blowouts are common on barrier islands. Hurricanes and other storms can result in the direct or indirect loss of sea turtle nests, either by erosion or washing away of the nests by wave action or inundation or "drowning" of the eggs or hatchlings developing within the nest or indirectly by loss of

nesting habitat. Depending on their frequency, storms can affect sea turtles on either a short-term basis (nests lost for one season and/or temporary loss of nesting habitat) or long term, if frequent (habitat unable to recover). How hurricanes affect sea turtle nesting also depends on their characteristics (winds, storm surge, rainfall), the time of year (within or outside of the nesting season), and where the northeast edge of the hurricane crosses land.

Because of the limited remaining nesting habitat, frequent or successive severe weather events could threaten the ability of certain sea turtle populations to survive and recover. Sea turtles evolved under natural coastal environmental events such as hurricanes. Hurricanes were probably responsible for maintaining coastal beach and dune nesting habitat through repeated cycles of destruction, alteration, and recovery. The extensive amount of pre-development coastal beach and dune habitat allowed sea turtles to survive even the most severe hurricane events. It is only within the last 20 to 30 years that the combination of habitat loss to beachfront development and destruction of remaining habitat by hurricanes has increased the threat to sea turtle survival and recovery. On developed beaches, typically little space remains for sandy beaches to become re-established after periodic storms. While the beach itself moves landward during such storms, reconstruction or persistence of structures at their pre-storm locations can result in a major loss of nesting habitat.

Beachfront Lighting

Beachfront lighting may cause disorientation (loss of bearings) and misorientation (incorrect orientation) of sea turtle hatchlings. Visual signs are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Dickerson and Nelson, 1989; Witherington and Bjorndal, 1991). Artificial beachfront lighting is a documented cause of hatchling disorientation and misorientation on nesting beaches (Philbosian, 1976; Mann, 1977; Conti, 2003). The emergence from the nest and crawl to the sea is one of the most critical periods of a sea turtle's life. Hatchlings that do not make it to the sea quickly become food for ghost crabs, birds, and other predators or become dehydrated and may never reach the sea. Some types of beachfront lighting attract hatchlings away from the sea while some lights cause adult turtles to avoid stretches of brightly illuminated beach. Research has documented significant reduction in sea turtle nesting activity on beaches illuminated with artificial lights, relative to adjacent areas (Witherington, 1992). During the 2002 sea turtle nesting season in Florida, over 43,000 turtle hatchlings were disoriented. Lighting associated with condominiums had the greatest impact causing disorientation/misorientation of 35 percent of the nests. Other causes included street lights, parking lot lights, single family residences, and sky glow (Conti, 2003).

Predation

Depredation by a variety of predators can considerably decrease sea turtle nest hatching success. Depredation and harassment, or both, of nesting turtles, eggs, nests and hatchlings by native and non-native species, such as raccoon, coyote, fox, feral hog, cats, birds, and ghost crab, have been documented on the Atlantic and Gulf coasts of Florida (Daniel et al., 2002; Northwest Florida Partnership, 2000; Leland, 1997; Maxwell, 2000; (National Marine Fisheries Service and U.S. Fish and Wildlife Service, 1991a). As nesting habitat dwindles, it is essential that nest production be naturally maximized so the turtles may continue to exist in the wild.

Predation of sea turtle nests and hatchlings on the beaches within the project area have been few. The majority of the predators include fox and coyote. However, predation by cats has been documented (Maxwell, 2000).

Driving on the Beach

The operation of motor vehicles on the beach affects sea turtle nesting by interrupting a female turtle approaching the beach; headlights disorienting or misorienting emergent hatchlings; vehicles running over hatchlings attempting to reach the ocean; and vehicle tracks traversing the beach interfering with hatchlings reaching the ocean. Apparently, hatchlings become diverted not because they cannot physically climb out of the rut (Hughes and Caine, 1994), but because the sides of the track cast a shadow and the hatchlings lose their line of sight to the ocean horizon (Mann, 1977). The extended period of travel required to negotiate tire tracks and ruts may increase the susceptibility of hatchlings to dehydration and depredation during migration to the ocean (Hosier *et al.*, 1981). Driving directly above or over incubating egg clutches or on the beach can cause sand compaction which may result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings, decreasing nest success and directly killing pre-emergent hatchlings (Mann, 1977; Nelson and Dickerson, 1987; Nelson, 1988). Vehicle traffic on narrow beaches where driving is concentrated on the high beach and foredune may contribute to beach erosion.

Walton County allows the public to drive on the beach under a local permit program. Driving is allowed along 600 feet of beachfront at Grayton Beach, between the western boundary of Grayton Beach State Park central unit and Defuniak Street. Driving is not permitted on other portions of the county beaches except for law enforcement and emergency response for human safety. No driving is allowed on the beaches in the City of Destin except for law enforcement purposes, emergency response for human safety, and contracted beach cleaning.

Sea Turtles Nesting

Sea turtle surveys in the Action Area are conducted by two entities. The South Walton Turtle Watch (SWTW) group monitors nesting on Walton County beaches except for on State Park lands (20 miles of 29 miles of beach). The monitoring is conducted under State of Florida permit no. 120 (Brost, 2003). The SWTW volunteers survey the beaches on foot. The Stranding Center Inc., under permit no. 033 monitors the 1.1 miles of beaches within the City of Destin in Okaloosa County. The beaches are surveyed using an all terrain vehicle (ATV).

Both entities conduct the surveys in similar fashion according to the State of Florida permit guidelines. Survey/monitoring is conducted seven days a week from May 15 to October 31. Surveys usually begin at sunrise but may begin one-half hour before sunrise. Turtle crawls are identified as a true nesting crawl or false crawl. Nests are marked with stakes and surrounded with surveyor flagging tape, and if needed screened to prevent predation. The marked nests are monitored throughout the incubation period for storm damage, predation, hatching activity and hatch and emergence success. Nests are relocated within the first 12 hours of being deposited, or before 9 a.m. the morning following deposition, if threatened by erosion or inundation.

Analysis of the species/critical habitat likely to be affected

The proposed action has the potential to adversely affect nesting females, nests, and hatchlings within the proposed project area. The effects of the proposed action on sea turtles will be considered further in the remaining sections of this biological opinion. Potential effects include destruction of nests deposited within the boundaries of the proposed project, harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities, disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting, behavior modification of nesting females due to escarpment formation within the project area during a nesting season resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs. The quality of the placed sand could affect the ability of female turtles to nest, the suitability of the nest incubation environment, and the ability of hatchlings to emerge from the nest.

Critical habitat for the four species of sea turtles has not been designated in the continental United States; therefore, the proposed action would have no effect on designated critical habitat.

ENVIRONMENTAL BASELINE

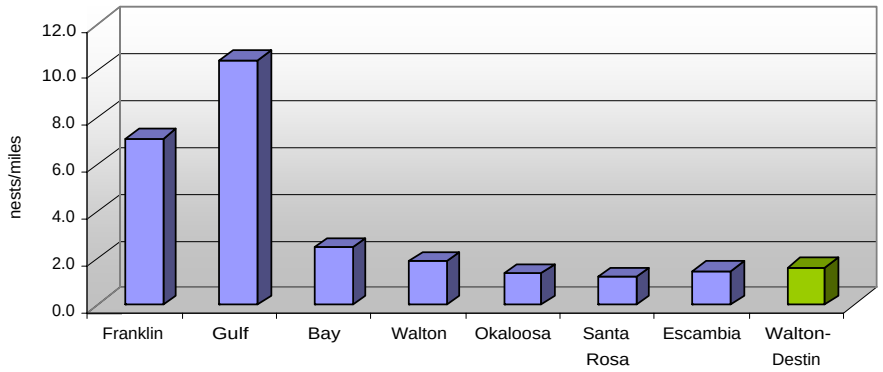
Status of the species within the Action Area

Nesting

The loggerhead sea turtle nesting and hatching season for northern Gulf of Mexico beaches extends from May 1 through November 30. Incubation ranges from about 45 to 95 days. Loggerhead nesting within the Action Area averaged about 1.6 nests per mile from 1993 to 2002 (Figure 5) (Brost, 2003).

During the sea turtle nesting seasons of 1993 to 2002, 763 loggerhead nests were documented. Approximately 55 percent (421) of all turtle crawls observed were false (non-nesting) crawls. Nests were either left in place (in situ) or relocated. Nests that were relocated were moved to higher beach elevations within the same vicinity of the original nest location. Loggerhead nests have been fairly evenly distributed along the 6.7 miles with no apparent nesting density difference between beaches within the Action Area. Average nest incubation period was 66 and 62 days, respectively for Walton and Destin Areas (Maxwell, 2003; Gray, 2003).

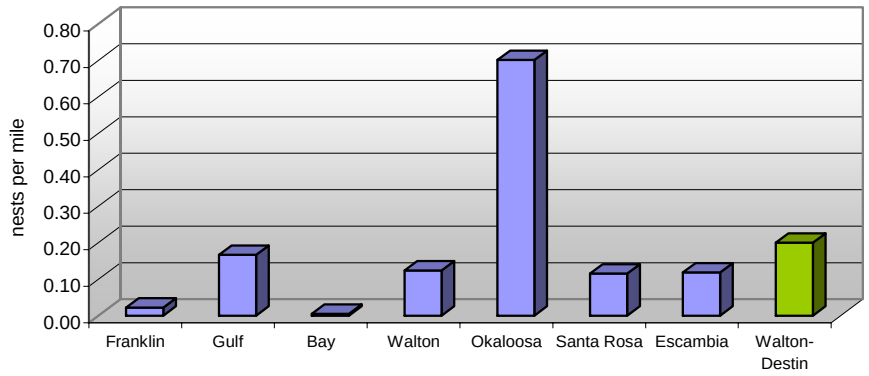
Figure 5: Average annual nesting density of loggerhead sea turtles in NW Florida, 1993-2002



The green sea turtle nesting and hatching season for the northern Florida Gulf of Mexico extends from May 15 through October 31. Incubation ranges from about 45 to 75 days. Green sea turtle nesting was first documented within the Action Area in 1996 (Walton County) and 1998 (Okaloosa County)(Figure 6). Subsequent green sea turtle nests have been found in the same

years as with other green sea turtle nests in northwest Florida (every other year pattern). Average incubation period for green sea turtle nests in the Action Area is 62 days (Maxwell, 2003; Gray, 2003).

Figure 6: Nesting density of green sea turtles in NW Florida in 1994, 1996, 1998, 2000, & 2002



The leatherback sea turtle nesting and hatching season for northern Gulf of Mexico beaches extends from June 1 through September 30. Incubation ranges from about 55 to 75 days. No leatherback or Kemp's ridley sea turtle nests have been documented within the Action Area. Leatherback nests have been documented on St. George Island, Alligator Point, and Santa Rosa Island (Brost, 2003).

No Kemp's ridley sea turtle nests have been documented within the Action Area. In 1998, a ridley nest was documented on Gulf Islands National Seashore, Perdido Key Unit, in Escambia County (Nicholas, 2000).

Factors affecting the species environment within the action area

Coastal Development

The development along the coastline within the Action Area has contributed to a reduction in the width and quality of beach and dune habitats used by sea turtle for nesting. The physical presence of development interferes or disrupts the dynamic shoreline process of erosion and accretion such that erosion is accelerated within the Action Area. The degradation of the quality of the nesting beach habitat is related to excessive beachfront lighting and increased human presence.

Beachfront Lighting

Currently, lighting impacts to nesting turtles and their hatchlings are the greatest threat within the Action Area. The negative effects of beachfront lighting increase with beach restoration or nourishment because the beach is elevated with the addition of sand. Dunes can help shield some of the light from beachfront development. However, the dunes that will be constructed as part of the proposed project (elevation 12 feet) will not be high enough to substantially reduce lighting disorientation from either beachfront development greater than one-story in height or the ambient glow from more landward development.

Coastal Erosion

The entire 6.7 miles of the Action Area have been designated as critically eroding by the State of Florida (FDEP, Office of Beaches and Coastal Systems, 2003). Critical erosion is defined by State of Florida as "a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critical erosion areas may also include peripheral segments or gaps between identified critical erosion areas which, although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects" (FDEP, Office of Beaches and Coastal Systems, 2003). The 6.7 miles are between reference monument R-39 and R-50 in Okaloosa County and R-1 and R-22.8 in Walton County (FDEP, Office of Beaches and Coastal Systems, 2003).

Predation of Sea Turtle Nests

Predators of sea turtle nests and hatchlings on the beaches within the Action Area have been primarily ghost crabs, racoons, and fox. It is unknown when the greatest occurrence of the predation occurs (immediately after the nests are deposited, during the incubation period, immediately before the nest hatches, or as the hatchlings emerge and crawl to the sea). Placing flat screens over the nests during the initial marking of the nest could substantially decrease depredation while minimally impacting the nest.

Sea Turtle Strandings

Both turtle programs participate in the State of Florida Sea Turtle Stranding and Salvage Network (STSSN) and complete and submits STSSN reports as appropriate. In 2003, 20 sea turtles were stranded in the Action Area (15 in Walton County and 5 in Destin) Redlow, 2004). The species that were stranded included: loggerhead (18), leatherback (1), and Kemp's ridley (1). Strandings in northwest Florida have increased over 80 percent from the previous ten-year average in the 1990's (Redlow, 2004).

EFFECTS OF THE ACTION

This section is an analysis of the beneficial, direct and indirect effects of the proposed action on nesting sea turtles, nests, eggs, and hatchling sea turtles within the Action Area. The analysis includes effects interrelated and interdependent of the project activities. An interrelated activity is an activity that is part of a proposed action and depends on the proposed activity. An interdependent activity is an activity that has no independent utility apart from the action.

Factors to be Considered

The proposed project will occur within habitat that is used by sea turtles for nesting and may be constructed during a portion of the sea turtle nesting season. Long-term and permanent impacts from the dredging could include a change in the nest incubation environment from the restoration/nourishment material. Short-term and temporary impacts to sea turtle nesting activities could result from project work occurring on the nesting beach during the active nesting or hatching period, changes in the physical characteristics of the beach from the placement of the beach restoration/nourishment material and change in the nest incubation environment from the material.

Proximity of Action: The beach restoration activities would occur directly in and adjacent to nesting habitat for sea turtles and dune habitats that ensure the stability and integrity of the barrier island. Specifically, the project would potentially impact nesting and hatchling loggerhead, green, leatherback, and Kemp's ridley sea turtles.

Distribution: The beach restoration activities that may impact nesting and hatchling sea turtles would occur along the 6.7-miles of beachfront. Specifically, the project activities will cover the Gulf of Mexico beachfront between FDEP reference monuments R-39 in Okaloosa County and R-21.93 in Walton County.

Timing: The sea turtle nesting season for northwest Florida is considered to extend between May 1 and November 30. The timing of the beach restoration activities could directly and indirectly impact nesting and hatchling sea turtles when conducted between these times. However, based on 10 years of data, sea turtle nesting and hatching season on the beaches of Walton County and City of Destin occurs between mid-May and late October. Thus, monitoring is limited currently to this more narrow time frame.

Nature of the Effect: The effects of the beach restoration activities may change the nesting behavior of adult female sea turtles or diminish the nesting success, change the behavior of hatchling sea turtles, and result in nests or hatching events being missed during the daily survey of the subject Action Area. Any decrease in productivity and/or survival rates would contribute to a vulnerability and endangerment of loggerhead, green, and leatherback sea turtles.

Duration: The beach restoration is a one-time activity and will take between 6 to 8 months to complete. Tentative plans are to begin the project on November 1, 2004. However, the work may begin before that in the 2004 Turtle season or continue into the 2005 sea turtle season. Thus, the direct effects should be short-term in duration. Indirect effects from the activity may continue to impact nesting and hatchling sea turtles in subsequent nesting seasons.

Disturbance frequency: The northwest Florida sub-populations of the various sea turtle species could experience decreased nesting success, hatching success and hatchling emergence with repeated monthly disturbance, resulting from the beach restoration activities being conducted at night during one nesting season.

Disturbance intensity and severity: Depending on the timing of the beach restoration activities during sea turtle nesting season, effects to the loggerhead and green sea turtle populations of the northwest Florida, and potentially the U.S., populations could be important. For loggerhead sea turtles, especially extirpation of the northwest Florida sub-population would probably not be replenished by regional dispersal from other nesting sub-populations. The significance of the green sea turtle nesting in northwest Florida to the conservation of the U.S. population of green sea turtles is unknown.

Analysis for effects of the action

Beneficial effects

The placement of sand on a beach with reduced dry fore-dune habitat may increase sea turtle nesting habitat if the placed sand is highly compatible (i.e., grain size, shape, color, etc.) with naturally occurring beach sediments in the area, and compaction and escarpment remediation measures are incorporated into the project. In addition, a nourished beach that is designed and constructed to mimic a natural beach system may be more stable than the eroding one it replaces, thereby benefitting sea turtles.

Direct effects

Placement of sand on an eroded section of beach or an existing beach may not provide suitable nesting habitat for sea turtles. Although beach restoration may increase the potential nesting area, significant negative impacts to sea turtles may result if protective measures are not incorporated during construction. Restoration during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of offspring from human-caused mortality and, along with other mortality sources, may significantly impact the long-term survival of the species. For instance, projects conducted during the nesting and hatching season could result in the loss of sea turtles through disruption of adult nesting activity and by burial or crushing of nests or hatchlings. While a nest monitoring and egg relocation program would reduce these impacts, nests may be inadvertently missed or misidentified as false crawls during daily patrols.

In addition, nests may be destroyed by operations at night prior to beach patrols being performed.

1. *Nest relocation*

Besides the potential for missing nests during a nest relocation program, there is a potential for eggs to be damaged by their movement, particularly if eggs are not relocated within 12 hours of deposition (Limpus *et al*., 1979). Nest relocation can have adverse impacts on incubation temperature (and hence sex ratios), gas exchange parameters, hydric environment of nests, hatching success, and hatchling emergence (Limpus *et al.*, 1979; Ackerman 1980; Parmenter 1980; Spotila *et al*., 1983; McGehee, 1990). Relocating nests into sands deficient in oxygen or moisture can result in mortality, morbidity, and reduced behavioral competence of hatchlings. Water availability is known to influence the incubation environment of the embryos and hatchlings of turtles with flexible-shelled eggs, which has been shown to affect nitrogen excretion (Packard *et al*., 1984), mobilization of calcium (Packard and Packard, 1986), mobilization of yolk nutrients (Packard *et al*., 1985), hatchling size (Packard *et al*., 1981; McGehee, 1990), energy reserves in the yolk at hatching (Packard *et al*., 1988), and locomotory ability of hatchlings (Miller *et al*., 1987).

In a 1994 Florida study comparing loggerhead hatching and emergence success of relocated nests with *in situ* nests, Moody (1998) found that hatching success was lower in relocated nests at 9 of 12 beaches evaluated and emergence success was lower in relocated nests at 10 of 12 beaches surveyed in 1993 and 1994.

2. *Equipment*

The placement of pipelines and the use of heavy machinery on the beach during a construction project may also have adverse effects on sea turtles. They can create barriers to nesting females emerging from the surf and crawling up the beach, causing a higher incidence of false crawls and unnecessary energy expenditure.

3. *Artificial lighting*

Visual cues are the primary sea-finding mechanism for hatchling sea turtles (Mrosovsky and Carr, 1967; Mrosovsky and Shettleworth, 1968; Dickerson and Nelson, 1989; Witherington and Bjorndal, 1991). When artificial lighting is present on or near the beach, it can misdirect hatchlings once they emerge from their nests and prevent them from reaching the ocean (Philibosian, 1976; Mann 1977; Florida Fish and Wildlife Conservation Commission sea turtle disorientation database). In addition, a significant reduction in sea turtle nesting activity has been documented on beaches illuminated with artificial lights (Witherington, 1992). Therefore, construction lights along a project beach and on the dredging vessel may deter females from coming ashore to nest, misdirect females trying to return to the surf after a nesting event, and misdirect emergent hatchlings from adjacent non-project beaches. Any source of bright lighting

can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and once they begin swimming offshore. Hatchlings attracted to light sources on dredging barges may not only suffer from interference in migration, but may also experience higher probabilities of predation to predatory fishes that are also attracted to the barge lights. This impact could be reduced by using the minimum amount of light necessary (may require shielding) or low pressure sodium lighting during project construction.

Beach nourishment projects create a wider and higher beach. The newly created beach berm also exposes sea turtles and their nests to lights that were less visible, or not at all visible, from nesting areas before the beach nourishment. Following a beach nourishment project in Brevard County, Florida, completed in the spring of 2001, up to 70 percent of the nests hatching from the restored beach were disoriented (Trindell, 2001). Installing beachfront lighting is the most effective method to decrease the number of disorientations on a restored beach. Changing to sea turtle compatible lighting can be easily accomplished at the local level through voluntary compliance or by adopting appropriate regulations. Of the 64 coastal counties in Florida, 17 have passed beachfront lighting ordinances in addition to 47 municipalities. The City of Destin adopted a lighting ordinance in February of 2004. A beachfront lighting ordinance has been before the Walton County Board of County Commissioners since early 2003.

Indirect effects

Indirect effects are those effects that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Effects from the proposed project may continue to affect sea turtle nesting on the project beach and adjacent beaches in future years. These effects consist of the following.

Many of the direct effects of beach restoration may persist over time and become indirect impacts. These indirect effects include increased susceptibility of relocated nests to catastrophic events, the consequences of potential increased beachfront development, changes in the physical characteristics of the beach, the formation of escarpments, and future sand migration.

1. *Increased susceptibility to catastrophic events*

Nest relocation may concentrate eggs in an area making them more susceptible to catastrophic events. Hatchlings released from concentrated areas also may be subject to greater predation rates from both land and marine predators, because the predators learn where to concentrate their efforts (Glenn, 1998; Wyneken *et al*., 1998).

2. *Increased beachfront development*

Pilkey and Dixon (1996) state that beach replenishment frequently leads to more development in greater density within shorefront communities that are then left with a future of further

replenishment or more drastic stabilization measures. Dean (1999) also notes that the very existence of a beach restoration project can encourage more development in coastal areas. Following completion of a beach restoration project in Miami during 1982, investment in new and updated facilities substantially increased tourism there (National Research Council, 1995). Increased building density immediately adjacent to the beach often resulted as older buildings were replaced by much larger ones that accommodated more beach users. Overall, shoreline management creates an upward spiral of initial protective measures resulting in more expensive development which leads to the need for more and larger protective measures. Increased shoreline development may adversely affect sea turtle nesting success. Greater development may support larger populations of mammalian predators, such as foxes and raccoons, than undeveloped areas (National Research Council, 1990a), and can also result in greater adverse effects due to artificial lighting, as discussed above.

3. *Changes in the physical environment*

Beach restoration may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, beach slope, sand color, sand grain size, sand grain shape, and sand grain mineral content if the placed sand is dissimilar from the original beach sand (Nelson and Dickerson, 1988a). These changes could result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson, 1987; Nelson, 1988).

Beach compaction and unnatural beach profiles that may result from beach restoration activities could negatively impact sea turtles regardless of the timing of projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson *et al,*. 1987; Nelson and Dickerson, 1988a). Significant reductions in nesting success (i.e., false crawls occurred more frequently) have been documented on severely compacted nourished beaches (Fletemeyer, 1980; Raymond, 1984; Nelson and Dickerson, 1987; Nelson *et al*., 1987), and increased false crawls may result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests and also cause increased physiological stress to the animals (Nelson and Dickerson, 1988c). Nelson and Dickerson (1988b) concluded that, in general, beaches nourished from offshore borrow sites are harder than natural beaches, and while some may soften over time through erosion and accretion of sand, others may remain hard for 10 years or more.

These impacts can be minimized by using suitable sand and by tilling compacted sand after project completion. The level of compaction of a beach can be assessed by measuring sand compaction using a cone penetrometer (Nelson, 1987). Tilling of a nourished beach with a root rake may reduce the sand compaction to levels comparable to unnourished beaches. However, a pilot study by Nelson and Dickerson (1988c) showed that a tilled nourished beach will remain uncompacted for up to one year. Therefore, the Service requires multi-year beach compaction monitoring and, if necessary, tilling to ensure that project impacts on sea turtles are minimized.

A change in sediment color on a beach could change the natural incubation temperatures of nests in an area, which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten dark restoration sediments; however, the timeframe for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season.

The Service's review of the sediment data for the borrow area and the native beach indicates that the restoration material closely resembles the native beach characteristics. Thus, we would anticipate that because of the similarity of the restoration material and the native beach sand impacts to sea turtles, nests, eggs, and hatchlings should be minimized (Rice, 2003).

4. *Escarpment formation*

On nourished beaches, steep escarpments may develop along their water line interface as they adjust from an unnatural construction profile to a more natural beach profile (Coastal Engineering Research Center 1984; Nelson *et al*., 1987). These escarpments can hamper or prevent access to nesting sites (Nelson and Blihovde, 1998). Researchers have shown that female turtles coming ashore to nest can be discouraged by the formation of an escarpment, leading to situations where they choose marginal or unsuitable nesting areas to deposit eggs (e.g., in front of the escarpments, which often results in failure of nests due to prolonged tidal inundation). This impact can be minimized by leveling any escarpments prior to the nesting season.

Species response to the proposed action

Ernest and Martin (1999) conducted a comprehensive study to assess the effects of beach restoration on loggerhead sea turtle nesting and reproductive success. The following findings illustrate sea turtle responses to and recovery from a restoration project. A significantly larger proportion of turtles emerging on nourished beaches abandoned their nesting attempts compared to turtles emerging on Control or pre-nourished beaches. This reduction in nesting success was most pronounced during the first year following project construction and is most likely the result of changes in physical beach characteristics associated with the restoration project (e.g., beach profile, sediment grain size, beach compaction, frequency and extent of escarpments). During the first post-construction year, the time required for turtles to excavate an egg chamber on the untilled, hard-packed sands of one treatment area increased significantly relative to Control and background conditions. However, in another treatment area, tilling was effective in reducing sediment compaction to levels that did not significantly prolong digging times. As natural processes reduced compaction levels on nourished beaches during the second post-construction year, digging times returned to background levels.

During the first post-construction year, nests on the nourished beaches were deposited significantly farther from both the toe of the dune and the tide line than were nests on control

beaches. Furthermore, nests were distributed throughout all available habitat and were not clustered near the dune as they were in the Control. As the width of nourished beaches decreased during the second year, among-treatment differences in nest placement diminished. More nests were washed out on the wide, flat beaches of the nourished treatments than on the narrower steeply sloped beaches of the Control. This phenomenon persisted through the second post-construction year monitoring and resulted from the placement of nests near the seaward edge of the beach berm where dramatic profile changes, caused by erosion and scarping, occurred as the beach equilibrated to a more natural contour.

As with other beach restoration projects, Ernest and Martin (1999) found that the principal effect of restoration on sea turtle reproduction was a reduction in nesting success during the first year following project construction. Although most studies have attributed this phenomenon to an increase in beach compaction and escarpment formation, Ernest and Martin indicate that changes in beach profile may be more important. Regardless, as a nourished beach is reworked by natural processes in subsequent years and adjusts from an unnatural construction profile to a more natural beach profile, beach compaction and the frequency of escarpment formation decline, and nesting and nesting success return to levels found on natural beaches.

This biological opinion is based on effects that are anticipated to loggerhead, green, leatherback, or Kemp's ridley sea turtles (nesting females or hatchlings) because: 1) the project may be conducted during the sea turtle nesting season, and 2) the nourished beach may cause a change in the behavior of nesting female turtles or a change in the nest incubation environment for an unknown period of time. In the context of sea turtle nests within the 6.7 mile Action Area, an average of 11 loggerhead sea turtle nests could be deposited during any one nesting season during the life of the project including the year the project is constructed, one green sea turtle nest could be deposited every other year during the life of the project or during the year the project is constructed, less than one leatherback sea turtle nest could be deposited every year during the life of the project, and less than one Kemp's ridley sea turtle nest could be deposited every other year during the life of the project. Any of these nests could be impacted by the proposed project.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the proposed Action Area considered in this biological opinion. Future 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 Act. The majority of the land within the Action Area is privately owned and is close to build out. What property has not been developed is expected to be rapidly developed. Further, re-development of some of the older built out beachfront areas may also occur in the future.

CONCLUSION

After reviewing the current status of the loggerhead, green, leatherback, and Kemp's ridley sea turtles, the environmental baseline for the Action Area, the effects of the proposed dredging and beach restoration, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the loggerhead, green, leatherback, or Kemp's ridley sea turtles. No critical habitat has been designated for any of the sea turtle species in the continental United States; therefore, none will be affected.

Despite the Conservation Measures proposed as part of the action, the proposed project will adversely affect approximately 373 acres of sea turtle nesting habitat along approximately 6.7 miles of Gulf of Mexico beachfront. The Action Area beach supports an average of 11 loggerhead sea turtle nests annually, one green sea turtle nest bi-annually, less than one leatherback sea turtle nest annually, and less than one Kemp's ridley sea turtle nest bi-annually. Research has shown that the principal effect of beach restoration on sea turtle reproduction is a reduction in nesting success, and this reduction is most often limited to the first year following project construction. Research has also shown that the impacts of a restoration project on sea turtle nesting habitat are typically short-term because a nourished beach will be reworked by natural processes in subsequent years, and beach compaction and the frequency of escarpment formation will decline. Although a variety of factors, including some that cannot be controlled, can influence how a restoration project will perform from an engineering perspective, measures can be implemented to minimize impacts to sea turtles.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out 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 under the Act 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 included in the permit issued by the Corps so that they become binding special conditions of the permit for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this

incidental take statement. If the Corps or the applicant (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the permit and its impacts on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

AMOUNT OR EXTENT TAKE

The Service has reviewed the biological information and other information relevant to this action. The Service anticipates 6.7 miles of nesting beach habitat could be taken as a result of this proposed action. The take is expected to be in the form of: (1) destruction of all nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities; (5) misdirection of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (6) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (7) destruction of nests from escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service.

Incidental take is anticipated for only the 6.7 miles of beach that have been identified for sand placement. The Service anticipates incidental take of sea turtles will be difficult to detect for the following reasons: (1) the turtles nest primarily at night and all nests are not found because [a] natural factors, such as rainfall, wind, and tides may obscure crawls and [b] human-caused factors, such as pedestrian and vehicular traffic, may obscure crawls, and result in nests being destroyed because they were missed during a nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beach and be forced to nest in a less than optimal area; (5) lights may disorient an unknown number of hatchlings and cause death; and (6) escarpments may form and cause an unknown number of females from accessing a suitable nesting site. Take of these species can be anticipated by the disturbance and restoration of suitable turtle nesting beach habitat because: (1) turtles nest within the project site; (2) beach restoration will likely occur during a portion of the nesting season; (3) the restoration project will modify the incubation substrate, beach slope, and sand compaction; and (4) artificial lighting will disorient nesting females and hatchlings. We anticipate take to be 11 loggerhead sea turtle nests, one green sea turtle nest, less than one leatherback sea turtle nest, and less than one Kemp’s ridley sea turtle nest.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to loggerhead, green, leatherback, or Kemp's ridley sea turtles. Critical habitat has not been designated in the Action Area; therefore, the project will not result in destruction or adverse modification of critical habitat for loggerhead, green, leatherback, or Kemp's ridley sea turtles.

Incidental take of nesting and hatchling sea turtles is anticipated to occur during the project construction and during the life of the project. The take will occur on nesting habitat consisting of the length of the beach where the restoration material will be placed.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measures are necessary and appropriate to minimize take of sea turtles in the proposed beach restoration Action Area.

The Walton-Destin Beach Restoration project may be conducted during the sea turtle nesting season (May 1 through October 31), provided the following reasonable and prudent measures are incorporated as conditions of the Corps permit.

1. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence must be used for the beach restoration project.

2. If the beach restoration project will be conducted during the sea turtle nesting season, surveys for nesting sea turtles must be conducted. If nests are constructed in the area of beach restoration, the eggs must be relocated.

3. Immediately after completion of the beach restoration project and prior to the next three nesting seasons, beach compaction must be monitored and tilling must be conducted as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.

4. Immediately after completion of the beach restoration project and prior to the next three nesting seasons, monitoring must be conducted to determine if escarpments are present, and if present, must be leveled as required to reduce the likelihood of impacting sea turtle nesting activities.

5. The applicant must ensure that contractors doing the beach restoration work fully understand the sea turtle protection measures detailed in this incidental take statement.

6. During the sea turtle nesting season, construction equipment and materials must be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.

7. During the sea turtle nesting season, lighting associated with the project must be minimized to reduce the possibility of disrupting and disorienting nesting and/or hatchling sea turtles.

8. All dune restoration and planting must be designed and conducted to minimize impacts to sea turtles.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the Corps must assure that the applicant complies with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

Proposed Work

All fill material placed must be sand that is similar to a native beach in the vicinity of the site that has not been affected by prior restoration or restoration activities. The fill material must be similar in both coloration and grain size distribution to the native beach. All such fill material must be free of construction debris, rocks, or other foreign matter and must not contain, on average, greater than 10 percent fines (i.e., silt and clay) (passing the #200 sieve) and must not contain, on average, greater than 5 percent coarse gravel or cobbles, exclusive of shell material (retained by the #4 sieve).

Protection of Sea Turtles

1. Daily early morning surveys will be required if any portion of the beach restoration project occurs during the period from May 1 through October 31. Nesting surveys will be initiated 70 days prior to restoration activities or by May 1, whichever is later. Nesting surveys must continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys. If nests are laid in areas where they may be affected by restoration activities, eggs must be relocated per the following requirements.

    1a. Nesting surveys and egg relocations will only be conducted by personnel with prior experience and training in nest survey and egg relocation procedures. Surveyors must have a valid Florida Fish and Wildlife Conservation Commission permit. Nest surveys must be conducted daily between sunrise and 9 a.m.

Surveys must be performed in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.

1b. Only those nests that may be affected by construction activities will be relocated. Nests requiring relocation must be moved no later than 9 a.m. the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. The relocation sites must be approved by the Fish and Wildlife Service prior to usage. Nest relocations in association with construction activities must cease when construction activities no longer threaten nests. Any nests left in the active construction zone must be clearly marked, and all mechanical equipment must avoid nests by at least 10 feet.

1c. Nests deposited within areas where restoration activities have ceased or will not occur for 70 days must be marked and left *in situ* unless other factors threaten the success of the nest. The turtle permit holder must install an on-beach marker at the nest site and a secondary marker at a point landward as possible to assure that future location of the nest will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string must be installed to establish an area of 10 feet radius surrounding the nest. No activity will occur within this area nor will any activity occur which could result in impacts to the nest. Nest sites must be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the restoration activity.

2. Immediately after completion of the beach restoration project and prior to May 1, for 3 subsequent years, sand compaction must be monitored in the area of beach restoration in accordance with a protocol agreed to by the Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, and the applicant. At a minimum, the protocol provided under 2a. and 2b. below must be followed. If required, the area shall be tilled to a depth of 36 inches. All tilling activity must be completed prior to May 1. If the project is completed during the nesting season, tilling will not be performed in areas where nests have been left in place or relocated. A report on the results of compaction monitoring shall be submitted to the Fish and Wildlife Service prior to any tilling actions being taken. An annual summary of compaction surveys and the actions taken must be submitted to the Fish and Wildlife Service. (NOTE: If the restoration is completed within 30 days of May 1, the compaction monitoring/tilling accomplished will be considered as one of the 3 years. The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Also, out-year compaction monitoring and remediation are not required if placed material no longer remains on the dry beach.)

2a. Compaction sampling stations must be located at 500-foot intervals along the project area. One station must be at the seaward edge of the dune/bulkhead line (when material is placed in this area); and one station must be midway between the dune line and the high water line (normal wrack line).

At each station, the cone penetrometer will be pushed to a depth of 6, 12, and 18 inches three times (three replicates). Material may be removed from the hole if necessary to ensure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of highly compact material may lay over less compact layers. Replicates will be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments. The three replicate compaction values for each depth will be averaged to produce final values for each depth at each station. Reports will include all 18 values for each transect line, and the final 6 averaged compaction values.

2b. If the average value for any depth exceeds 500 pounds per square inch (psi) for any two or more adjacent stations, then that area must be tilled prior to May 1. If values exceeding 500 psi are distributed throughout the project area, but in no case do those values exist at two adjacent stations at the same depth, then consultation with the Fish and Wildlife Service will be required to determine if tilling is required. If a few values exceeding 500 psi are randomly present within the project area, tilling will not be required.

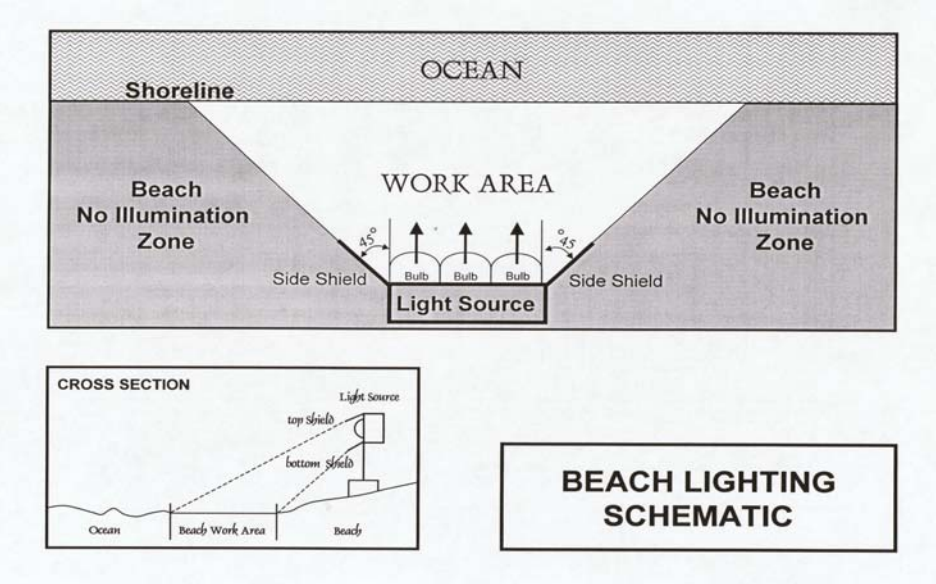
3. Visual surveys for escarpments along the project area must be started immediately upon completion of each section of beach if within the time period May 1 through October 31, and prior to April 1, for 3 subsequent years. Results of the surveys must be submitted to the Fish and Wildlife Service prior to any action being taken. Escarpments that interfere with sea turtle nesting as determined by the nesting surveyors or that exceed 18 inches in height for a distance of 100 ft must be leveled to the natural beach contour by April 15. If the project is completed during the sea turtle nesting and hatching season, escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. The Fish and Wildlife Service must be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting as determined by the nesting surveyors or that exceed 18 inches in height for a distance of 100 ft occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Fish and Wildlife Service will provide a brief written authorization that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken must be submitted to the Fish and Wildlife Service. To ensure compliance with this condition, turtle nesting surveys must be conducted for 3 years following beach restoration. (NOTE: Out-year

escarpment monitoring and remediation are not required if placed material no longer remains on the beach.)

4. The applicant must arrange a meeting between representatives of the contractor, the Service, the Florida Department of Environmental Protection, Bureau of Beaches and Wetland Resources, and the Florida Fish and Wildlife Conservation Commission, Bureau of Protected Species Management and the permitted person responsible for egg relocation at least 30 days prior to the commencement of work on this project. At least 10 days advance notice must be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.

5. From May 1 through October 31, staging areas for construction equipment must be located off the beach to the maximum extent practicable. Night-time storage of construction equipment not in use must be off the beach to minimize disturbance to sea turtle nesting and hatching activities. In addition, all construction pipes that are placed on the beach must be located as far landward as possible without compromising the integrity of the existing or reconstructed dune (berm) system. Temporary storage of pipes must be off the beach to the maximum extent possible. Temporary storage of pipes on the beach must be in such a manner so as to impact the least amount of nesting habitat and must likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

6. From May 1 through October 31, direct lighting of the beach and near shore waters must be limited to the immediate construction area and must comply with safety requirements. Lighting on offshore or onshore equipment must be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the waters surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity of lighting plants must be reduced to the minimum standard required by OSHA for General Construction areas, in order not to mis-direct sea turtles. Shields must be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area (see below schematic).



Dune Creation

1. If planting of dune vegetation occurs during the turtle nesting season (May 1 through October 31) the following conditions must be implemented:

   1a. Daily early morning nesting surveys will be required during the period from May 1 through October 31. Nest surveys must only be conducted by personnel with prior experience and training in nest surveys. Surveyors must have a valid Florida Fish and Wildlife Conservation Commission permit. Nest surveys must be conducted daily between sunrise and 9 a.m. No dune planting activity will occur until after the daily turtle survey and nest conservation and protection efforts have been completed.

   1b. Nesting surveys must be initiated 70 days prior to dune planting activities or by May 1, whichever is later. Nesting surveys must continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys.

   1c. Any nests deposited in the dune planting area not requiring relocation for conservation purposes shall be left *in situ*. The turtle permit holder must install an on-beach marker at the nest site and a secondary marker at a point as far landward as possible to assure that future location of the nest will be possible should the on-

beach marker be lost. A series of stakes and highly visible survey ribbon or string must be installed to establish an area of 3 ft radius surrounding the nest. No planting or other activity will occur within this area nor will any activity occur which could result in impacts to the nest. Nest sites must be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the planting activity.

1d. If a nest is disturbed or uncovered during planting activity, the permittee must cease all work and immediately contact the responsible turtle permit holder. If a nest(s) cannot be safely avoided during planting, all activity within the affected project site must be delayed until hatching and emerging success monitoring of the nest is completed.

1e. All dune planting activities must be conducted during daylight hours only.

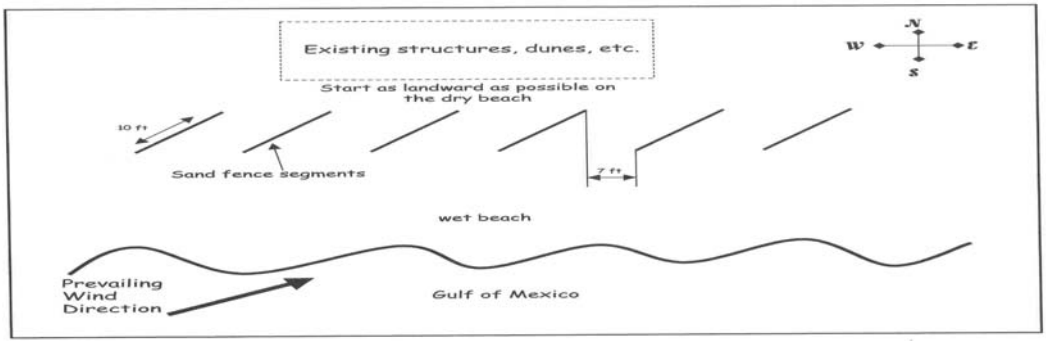
1f. All dune vegetation must consist of plant species native to the area and be planted in accordance with Florida Department of Environmental Protection guidelines.

1g. No use of heavy equipment (trucks) will occur on the dunes or seaward. A lightweight (ATV type) vehicle, with tire pressures of 10 psi or less may be operated on the beach.

1h. All irrigation, if proposed, must be installed by hand labor or tools and entrenched 1 to 3 inches below grade so as not to pose a barrier to hatchling turtles and to allow for easy removal. The irrigation system must be designed and maintained so that watering of the adjacent sandy beach does not occur. If a turtle nest is deposited within the newly established planted dune area, the applicant must modify the irrigation system so that no watering occurs within 10 ft of the nest. Daily inspection of the irrigation system must be conducted to assure the irrigation system is properly working and meets the above conditions. The irrigation system must be completely removed once watering is no longer needed or before May of the next year.

2. Any sand fencing or other dune restoration material placed in the project area must be installed as follows:

2a. A maximum of 10 foot-long spurs of parallel fence spaced at a minimum of 7 ft apart must be installed on a northeast-southwest (diagonal) alignment (below schematic).



2b. All fence material must be repositioned as necessary to facilitate dune building and must be removed when 30 percent of the fence is covered with sand.

2c. Upon site inspection by the Fish and Wildlife Service, Florida Department of Environmental Protection, Bureau of Beaches and Wetland Resources, or the Florida Fish and Wildlife Conservation Commission, Bureau of Protected Species Management, if it is determined that the fence adversely impacts nesting or hatchling turtles, the fence must be removed or repositioned as appropriate.

Reporting

1. A report describing the actions taken to implement the terms and conditions of this incidental take statement must be submitted to the Project Leader, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida, 32405, within 60 days of completion of the terms and conditions for each year. This report will include the dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, descriptions and locations of self-release beach sites, nest survey and relocation results, and hatching and emerging success of nests.

2. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for egg relocation for the project must be notified so the eggs can be moved to a suitable relocation site.

3. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification must be made to either the Florida Fish and Wildlife Conservation Commission Stranding and Salvage Network by pager: 1-800-241-4653, ID#274-4867 (make sure you input your area code with your telephone number) or the FWC Division of Law Enforcement at 1-888-404-FWCC; and the U.S. Fish and Wildlife Service Office located in Panama City, Florida at (850) 769-0552. Care should

be taken in handling injured turtles or eggs to ensure effective treatment or disposition, and in handling dead specimens to preserve biological materials in the best possible state for later analysis.

The Service believes that incidental take will be limited to the 6.7 miles of beach that have been identified for beach restoration. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than the following levels and types of incidental take will result from the proposed project: (1) all sea turtle nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all sea turtle nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent project and non-project beaches; (4) disorientation of hatchling turtles on adjacent project and non-project beaches as they emerge from the nest and crawl to the water; (5) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; (6) destruction of all nests as a result of escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service; and (7) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site. We anticipate take to be 11 loggerhead sea turtle nests, one green sea turtle nest, less than one leatherback sea turtle nest, and less than one Kemp's ridley sea turtle nest.

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. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Endangered Species Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary 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. We encourage the applicant to meet with the Service to discuss conservation of sea turtles and ways that they could help contribute to their recovery.

1. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.

2. A sea turtle lighting ordinance should be adopted and implemented in Walton County (Destin adopted an ordinance in February 2004). In the interim, Walton County should: a) replace or retrofit existing County or City-controlled lighting to sea turtle lighting, b) encourage beachfront property owners to convert or install sea turtle lighting, and c) work with Gulf Power and Chelco to retrofit street lights as appropriate.

3. The proposed dunes should be created by either planting only vegetation and allowing the dunes to form naturally or by piling the sand in wide rather than tall mounds. If the second method is selected, the dunes should be formed using the existing sand on the beach. The existing sand on the beach should be pushed landward prior to the placement of the restoration material from offshore.

4. Dune walkovers and parking areas should be constructed where appropriate to protect dune habitats at beach access points.

5. Walton County and the City of Destin should consider measures to limit coastal development that would exacerbate coastal erosion and then require storm protection in the future.

6. To increase public awareness about sea turtles, informational signs should be placed at beach access points where appropriate. The signs should describe the importance of the beach to sea turtles and/or the life history of sea turtle species that nest in the area.

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

If you have any questions regarding biological opinion, please contact Ms. Lorna Patrick at ext. 229.

Sincerely yours,

Gail A. Carmody
Field Supervisor

cc:
FWS, Jacksonville, FL (Sandy MacPherson)(w/ copy of PN)
NMFS, Habitat Conservation, Panama City, FL (Mark Thompson)
NMFS, Protected Species, St. Pete., FL
FWC, Non-game program, Panama City, FL (Karen Lamonte)
FWC, Office of Protected Species Mgt., Tallahassee, FL (Robbin Trindell)
USEPA, Atlanta, GA (Haynes Johnson)
FDEP, Office of Beaches and Coastal Systems, Tallahassee, FL (Jamie Christoff)
FDEP, Panama City, FL
Brad Pickel, South Walton TDC, Santa Rosa Beach, FL
Lindey Chabot, City of Destin, Destin, FL
Danielle Slaterpryce, Okaloosa County Public Works, Crestview, FL
Sharon Maxwell, South Walton Turtle Watch Program, Freeport, FL
George Gray, The Stranding Center, Inc., Destin, FL

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