

United States Department of the Interior



FISH AND WILDLIFE SERVICE

South Florida Ecological Services Office

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February 20, 2004

Colonel Robert M. Carpenter
District Engineer
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

Service Log No.: 4-1-04-F-5233

Application No.: 199402783 (IP-KBH)

Date: December 2, 2003

Project: Improvements to U.S. Highway 1 from
Key Largo to Florida City

Applicant: Florida Department of Transportation
County: Miami-Dade and Monroe

Dear Colonel Carpenter:

This document is the Fish and Wildlife Service's (Service) biological opinion for the proposed improvements to U.S. Highway (U.S.) 1 from Key Largo to Florida City. The project includes the removal of the Lake Surprise Causeway and the construction of a fixed-span bridge over Jewfish Creek and Lake Surprise. The biological opinion addresses potential effects of the project listed above on the Miami-Dade County segment of the Atlantic Subpopulation of the West Indian (= Florida) manatee (*Trichechus manatus*) (manatee), in accordance with section 7 of the Endangered Species Act of 1973, as amended (ESA) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*), the Marine Mammal Protection Act of 1972, as amended (MMPA) (16 U.S.C. 1461 *et seq.*), and the provisions of the Fish and Wildlife Coordination Act of 1958, as amended (48 Stat. 401; 16 U.S.C. 661 *et seq.*).

This biological opinion was prepared based on information provided by the U.S. Army Corps of Engineers (Corps), the Corps' Reach Characterization Analysis, the *Florida Manatee Recovery Plan* (Service 2001), the *South Florida Multi-Species Recovery Plan* (Service 1999), data supplied by the Florida Fish and Wildlife Conservation Commission (FWC) and by the Florida Marine Research Institute, and other sources of information. A complete administrative record of this consultation is on file at the Service's South Florida Ecological Services Office in Vero Beach, Florida.

In the Public Notice dated December 2, 2003, the Corps provided a determination of "may affect, not likely to adversely affect" for the endangered American crocodile (*Crocodylus acutus*), the endangered wood stork (*Mycteria americana*), the endangered Everglade snail kite (*Rostrhamus*



sociabilis plumbeus), the endangered Key Largo woodrat (*Neotoma floridana smalli*), the endangered Key Largo cotton mouse (*Peromyscus gossypinus allapaticola*), the threatened bald eagle (*Haliaeetus leucocephalus*), the endangered Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*), the threatened eastern indigo snake (*Drymarchon corais couperi*), and the endangered Schaus swallowtail butterfly (*Heracles aristodemus ponceanus*). The Service concurred with this determination in a letter dated January 13, 2004.

The Corps also made a determination of “may affect” for the endangered Florida panther (*Puma concolor coryi*). In the letter to the Corps referenced above, the Service indicated that based on the applicant proposal to install wildlife underpasses and fencing along the roadway corridor, the Service believes the project may affect but is not likely to adversely affect the Florida panther. In a letter dated February 12, 2004, the Corps changed its determination for the panther to “may affect, not likely to adversely affect.” The Service concurs with this determination.

CONSULTATION HISTORY

On December 9, 2003, the Service met with representatives of the Florida Department of Transportation (FDOT) to discuss proposed improvements to U.S. 1 from Florida City to Key Largo.

On December 10, 2003, the Service received a public notice from the Corps requesting concurrence on a “may affect” determination for the manatee and initiation of formal consultation for the proposed action.

On December 11, 2003, the Service met with representatives of the Corps, FDOT, the U.S. Coast Guard, National Marine Fisheries Service, the Federal Highways Administration, and the FWC to discuss proposed improvements to U.S. 1 from Florida City to Key Largo.

On January 13, 2004, the Service sent a letter to the Corps acknowledging the “may affect” determination for the West Indian manatee, and stated that a biological opinion for the project would be sent to the Corps on, or before May 23, 2004.

On February 12, 2004, the Service received a letter from the Corps changing their determination for the Florida panther to “may affect, not likely to adversely affect.”

This biological opinion was prepared based on information provided by the Corps, the Corps’ Reach Characterization Analysis, the *Florida Manatee Recovery Plan* (Service 2001), the *South Florida Multi-Species Recovery Plan* (Service 1999), data supplied by the FWC, and other sources of information (see Literature Cited). A complete administrative record of this consultation is on file at the Service’s South Florida Ecological Services Office in Vero Beach, Florida.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The project discussed below occurs within Reach 1 and Reach 25 of the Corps' Reach Characterization Analysis in Miami-Dade County and Monroe County, Florida. Reach 1 encompasses the waters of the Biscayne Bay, Card Sound, and Barnes Sound from the MacArthur Causeway to U.S. 1, and all connecting tributaries and residential canal systems in Miami-Dade County and Monroe County, Florida. Reach 25 includes the waters of Florida Bay and waters of the Atlantic Ocean immediately adjacent to the Florida Keys from U.S. 1 to Key West, and all connecting tributaries and residential canal systems in Monroe County, Florida.

The applicant proposes roadway improvements to a 20.4-mile section of U.S. 1 from Key Largo to Florida City. The proposed improvements include the reconstruction of the existing two-lane roadway with the addition of a median between the travel lanes. The median consists of two, 6-foot wide, paved shoulders separated by a 2-foot wide concrete barrier. In addition, a 12-foot wide outside shoulder will be added to the northbound lane and a 10-foot wide outside shoulder will be added to the south bound lane. The project will also include replacement of the C-111 Bridge, the Jewfish Creek Bridge, and removal of the Lake Surprise Causeway. No blasting will be associated with the removal of the bridges or causeway. A fixed span bridge with a 65-foot vertical clearance will be constructed over Jewfish Creek, and a new low level fixed-span bridge will be constructed over Lake Surprise. The Lake Surprise Bridge will include ramps that provide access to local residences and businesses. The applicant has also designed the project to improve hydrologic flow through the project corridor and allow wildlife movement across the corridor. A total of 25 pipe culverts and 4 bridges/wildlife underpasses will be installed north of the C-111 Canal, and 16 box culverts and 4 bridges will be installed or replaced south of the C-111 Canal. The purpose of the project is to improve public safety and facilitate evacuation of the Florida Keys prior to a hurricane. The project site is located in Section 25, Township 57 South, Range 38 East; Sections 30 and 31, Township 57 South, Range 39 East; Sections 6, 7, 18, 19, 20, 29, and 32, Township 58 South, Range 39 East; Sections 5, 8, 16, 17, 21, 28, and 33, Township 59 South, Range 39 East; and Section 4, Township 60 South, Range 39 East, Miami-Dade County, Florida, and Section 31, Township 60 South, Range 40 East, Monroe County, Florida.

The project will result in the filling of 85.6 acres of wetlands and temporary impacts to 20.1 acres of wetlands. To compensate for impacts to wetlands, the applicant has already completed restoration and enhancement of 385.22 acres of wetlands near the project corridor. This mitigation included removing fill, backfilling canals and borrow pits, and restoring non-vegetated bottom habitat at the Harrison Tract, the C-109 site, the C-111 site, and within a 1.5-mile long parcel adjacent to the existing roadway corridor. In addition, the applicant proposes to restore 10.34 acres of emergent wetlands by removing the FWC's access road located approximately 2 miles south of Work Camp Road.

The project will result in direct impacts to 6.70 acres of seagrasses and temporary impacts to 0.60 acre of seagrasses. The applicant proposes to compensate for impacts to seagrasses by restoring 6.1 acres of seagrass habitat following the removal of the Lake Surprise Causeway and the approaches to the Jewfish Creek Bridge. The applicant will also restore 4 acres of seagrass habitat at Little Blackwater Sound by the installation of box culverts under U.S. 1, and 20.35 acres of seagrass habitat at Boca Chica Naval Air Station by planting seagrasses and restoring tidal connections to an impounded lagoon.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

West Indian (= Florida) manatees are massive fusiform-shaped mammals with skin that is uniformly dark grey, wrinkled, sparsely haired, and rubber-like. Manatees possess paddle-like forelimbs, no hind limbs, and a spatulate, horizontally flattened tail. Females have two axillary mammae, one at the posterior base of each forelimb. Their bones are massive and heavy with no marrow cavities in the ribs or long bones of the forearms (Odell 1982). Adults average about 10 feet in length and 2,200 pounds in weight, but may reach lengths of up to 15 feet (Gunter 1941) and weigh as much as 3,570 pounds (Rathbun et al. 1990). Newborns average 4 to 4.5 feet in length and weigh about 66 pounds (Odell 1981). The nostrils located on the upper snout, open and close by means of muscular valves as the animals surface and dive (Husar 1977; Hartman 1979). A muscular flexible upper lip is used with the forelimbs to manipulate food into the mouth (Odell 1982). Bristles are located on the upper and lower lip pads. Molars designed to crush vegetation form continuously at the back of the jaw and move forward as older ones wear down (Domning and Hayek 1986). The eyes are very small, close with sphincter action, and are equipped with inner membranes that can be drawn across the eyeball for protection. The ears are external, minute, with no pinnae. The anatomy of the internal ear structure indicates that they can hear sounds within a relatively narrow low frequency range, that their hearing is not acute, and that they have difficulty in localizing sound (Ketten et al. 1992). However, Gerstein (1995) suggested that manatees may have a greater low-frequency sensitivity than other marine mammal species that have been tested.

Critical habitat for any species is described as the specific area within the geographic area occupied by the species, at the time it is listed under the provisions of section 4 of the ESA, on which are found those physical or biological features (*i.e.*, constituent elements): (1) essential to the conservation of the species; and (2) which may require special management considerations or protection [ESA §3 (5)(A)].

Critical habitat for this species was designated in 1976 (50 CFR 17.95). Designated critical habitat on the west coast of Florida includes Crystal River in Citrus County, portions of the Little Manatee River in Hillsborough County, the Manatee River in Manatee County, the Myakka River in Sarasota and Charlotte Counties, the Peace River in DeSoto and Charlotte Counties, and the Caloosahatchee River in Lee County. It also includes all the coastal waters in Lee, Collier, and Monroe Counties between Gordon's Pass (Collier County) and Whitewater Bay (Monroe County).

Designated manatee critical habitat on the Atlantic Coast of Florida includes those intracoastal waters connecting rivers and bays from the Florida/Georgia border south to Key Largo in Monroe County, excluding those waters in Broward County, Florida. The Atlantic Subpopulation of manatees also uses critical habitat identified between Key Largo and mainland Miami-Dade County in Florida Bay.

Constituent elements for any designated critical habitat include those physical and biological features essential to the conservation of the species. No specific primary or secondary constituent elements were included in the critical habitat designation. However, researchers agree that essential habitat features for the manatee include seagrasses for foraging, shallow areas for resting and calving, channels for travel and migration, warmwater refuges during cold weather, and fresh water for drinking (Service 2001).

Life history

Manatees are herbivores that feed opportunistically on a wide variety of aquatic vegetation. Feeding rates and food preferences depend, in part, on the season and available plant species. Manatees frequently feed in water depths of 3 to 9 feet where aquatic vegetation is abundant. Seagrasses appear to be a staple of the manatee diet in coastal areas (Ledder 1986; Provancha and Hall 1991; Kadel and Patton 1992; Koelsch 1997; Lefebvre et al. 2000). Manatees can remain submerged for several minutes with the longest submergence record lasting 24 minutes (Reynolds 1981).

Breeding takes place when one or more males (ranging from 5 to 22 individuals) are attracted to an estrous female to form a temporary mating herd (Rathbun et al. 1995). Mating herds can last up to 4 weeks, with different males joining and leaving the herd daily (Hartman 1979; Bengston 1981; Rathbun et al. 1995; Rathbun 1999). Permanent bonds between males and females do not form. During peak activity, the males in mating herds compete intensely for access to the female (Hartman 1979). Successive copulations involving different males have been reported. Some observations suggest that larger, presumably older, males dominate access to females early in the formation of mating herds and are responsible for most pregnancies (Rathbun et al. 1995). Although breeding has been reported in all seasons, Hernandez et al. (1995) reported that histological studies of reproductive organs from carcasses of males found evidence of sperm production in 94 percent of adult males found between March and November. Females appear to reach sexual maturity by about age 5 but have given birth as early as 4 (Marmontel 1995; Odell et al. 1995; O'Shea and Hartley 1995; Rathbun et al. 1995), and males may reach sexual maturity at 3 to 4 years of age (Hernandez et al. 1995). Manatees may live in excess of 50 years (Marmontel 1995), and evidence for reproductive aging is unclear (Marmontel 1995; Rathbun et al. 1995).

Calf dependency usually lasts 1 to 2 years after birth (Hartman 1979; O'Shea and Hartley 1995; Rathbun et al. 1995; Reid et al. 1995). Calving intervals vary greatly among females, with an average birth cycle of 2 to 2.5 years, but may be considerably longer depending on age and perhaps other factors (Marmontel 1995; Odell et al. 1995; Rathbun et al. 1995; Reid et al. 1995).

Females that abort or lose a calf due to perinatal death (small manatees, less than 60 inches in length) (O'Shea and Hartley 1995), may become pregnant again within a few months (Odell et al. 1995) or even weeks (Hartman 1979).

Manatees often use secluded canals, creeks, embayments, and lagoons, particularly near the mouths of coastal rivers and sloughs, for feeding, resting, playing, mating, and calving (Marine Mammal Commission [MMC] 1986 and 1988). Manatees frequent coastal, estuarine, and riverine habitats and are capable of extensive north-south migrations. Based on telemetry, aerial surveys, photo-identification sighting records, and other studies over the past 20 years, manatee distribution in the southeastern United States is better understood (Beeler and O'Shea 1988; O'Shea 1988; MMC 1984 and 1986; Lefebvre et al. 1989). In general, the data reveal that manatees exhibit opportunism, as well as predictable patterns in their distribution and movement.

They are able to undertake extensive north-south migrations with seasonal distribution determined by water temperature below 68 degrees Fahrenheit (20 degrees Celsius). Manatees depend on areas with access to natural springs, manmade warmwater refugia, areas with vascular plants, and freshwater sources. Manatees normally migrate along shorelines and use deeper corridors to access shallow water feeding and resting areas. When ambient water temperatures drop below 68 degrees Fahrenheit in autumn and winter, manatees aggregate within the confines of natural or artificial warmwater refuges (Lefebvre et al. 1989) or move to the southern tip of Florida (Snow 1991). Most warmwater artificial refuges are created by outfalls from power plants or paper mills. As water temperatures rise, manatees disperse from these winter aggregation areas. While some remain near their winter refuges, others undertake extensive migrations along the coast of Florida and far up rivers and canals. Most manatees return to the same warmwater refuges each year. However, some manatees use different refuges in different years, and others use two or more refuges in the same winter (Reid and Rathbun 1984; Rathbun et al. 1990; Reid et al. 1991). There are many lesser known, minor aggregation areas used as temporary thermal refuges. Most of these are canals or boat basins where warmwater temperatures persist as temperatures in adjacent bays and rivers decline.

Population dynamics

The Florida manatee population is divided into four subpopulations: Northwest, Southwest, Atlantic, and Upper St. Johns River (Appendix A). Long-term studies suggest four regional populations of manatees in Florida: (a) the Northwest Subpopulation, comprising approximately 12 percent of the total Florida manatee population, and consisting of the counties along the Gulf of Mexico from Escambia County east and south to Hernando County, Lafayette, and Gilchrist Counties, and Marion County adjacent to the Withlacoochee River; (b) the Upper St. Johns River Subpopulation, comprising approximately 4 percent of the total Florida manatee population, and consisting of Putnam County from Palatka south, Volusia, Flagler, and Marion Counties adjacent to the St. Johns River or its tributaries, and Lake and Seminole Counties; (c) the Atlantic Subpopulation, comprising approximately 42 percent of the total Florida manatee population, and consisting of counties along the Atlantic coast from Nassau County south to Miami-Dade County, the portion of Monroe County adjacent to the Florida Bay and the Florida Keys, Okeechobee County, and counties along the lower portion of the St. Johns River north of

Palatka, which includes Putnam, St. Johns, Clay, and Duval Counties; and (d) the Southwest Subpopulation, comprising approximately 42 percent of the total Florida manatee population and consisting of the counties along the Gulf of Mexico from Pasco County south to Whitewater Bay in Monroe County and DeSoto, Glades, and Hendry Counties. These divisions are based primarily on documented manatee use of wintering sites and from radio-tracking studies of individuals' movements (Bengston 1981; MMC 1988; Rathbun et al. 1990; Beck and Reid 1995; Rathbun et al. 1995; Reid et al. 1995; Deutsch et al. 1998).

The previous recovery plan (Service 1996) identified the need for a population status working group to assess manatee population size and trends. The first meeting of the Manatee Population Status Working Group (MPSWG), a subcommittee of the Recovery Team, was held in March 1998. The goals of the MPSWG are to: (1) assess the status of the Florida manatee population; (2) advise the Service on population recovery criteria for determining when recovery has been achieved; (3) provide interpretation of available information on manatee population biology to managers; (4) make recommendations concerning needed research directions and methods; and (5) obtain rigorous external review of manatee population data, conclusions, and research methods by independent researchers with expertise in population biology.

In 2001, the MPSWG provided a statement summarizing what they believed to be the status of the Florida manatee at that time (Wildlife Trust 2001). The MPSWG stated that, for the Northwest and Upper St. Johns River Stocks, available evidence indicated that there had been a steady increase in animals over the last 25 years. The statement was less optimistic for the Atlantic Subpopulation due to an adult survival rate that was lower than the rate necessary to sustain population growth. The MPSWG believed that this subpopulation had likely been growing slowly in the 1980s, but since then may have leveled off or even possibly declined. They considered the status of the Atlantic Subpopulation to be "too close to call." Such finding was consistent with high levels of human-related and, in some years, cold-related deaths in this subpopulation.

Regarding the Southwest Subpopulation, the MPSWG acknowledged that further data collection and analysis would be necessary to provide an assessment of the manatee's status in this subpopulation. Preliminary estimates of adult survival available to the MPSWG at that time indicated that the Southwest Subpopulation was similar to the Atlantic Subpopulation and "had substantially lower [adult survival estimates] than for the Northwest and Upper St. Johns River [subpopulations]." The Southwest Subpopulation was noted for having high levels of watercraft-related manatee deaths and injuries and natural mortality events (*i.e.*, red tide and cold stress). According to more recent analyses by Runge et al. (in review), growth rates in the Southwest Subpopulation approximate a rate of -1.1 percent per year (95 percent confidence interval of -5.4 to 2.4). Estimated growth rates are thought to be highest in the Upper St. Johns River Subpopulation (+6.2 percent per year [95 percent confidence interval of 3.7 to 8.1]), followed by the Northwest Subpopulation (+3.7 percent per year [95 percent confidence interval of 1.6 to 5.6]), and the Atlantic Subpopulation (+1.0 percent per year [95 percent confidence interval of -1.2 to 2.9]).

A Population Viability Analysis (PVA), in which random events (such as red tide, extremely cold winter, and loss of warmwater sites) are incorporated into a model, was carried out for manatees based on age-specific mortality rates estimated from the age distribution of manatees found dead throughout Florida from 1979 through 1992 (Marmontel et al. 1997). This method of estimating survival relied on certain assumptions that were not fully testable; despite this, the results again pointed out the importance of adult survival to population persistence. Given a population size that reflected a 1992 minimum population estimate, the PVA showed that if adult mortality as estimated for the study period were reduced by a modest amount (for example, from 11 percent down to 9 percent), the Florida manatee population would likely remain viable for many years. However, the PVA also showed that slight increases in adult mortality would result in extinction of manatees within the next 1,000 years.

Status and distribution

Based on telemetry studies, aerial surveys, photo-identification studies, and other research over the past 20 years, manatee distribution in the southeastern United States is better understood (Beeler and O'Shea 1988; O'Shea 1988; MMC 1984, 1986; and Lefebvre et al. 1989). Florida manatees can be found in Florida waters throughout the year, and nearly all manatees use the waters of peninsular Florida during the winter months. In winter months, most manatees rely on warmwater from industrial discharges and natural springs for warmth. In warmer months, they expand their range and occasionally are seen as far north as Rhode Island on the Atlantic Coast and as far west as Texas on the Gulf Coast.

Despite significant efforts dating back to the late 1970s and early 1980s, scientists have been unable to develop a statistically and scientifically repeatable means of estimating or monitoring trends in the size of the overall manatee population in the southeastern United States (O'Shea 1988; O'Shea et al. 1992; Lefebvre et al. 1995). Even though many manatees aggregate at warmwater refuges in winter and most, if not all, such refuges are known, direct counting methods (*e.g.*, aerial and ground surveys) are unable to account for the number of animals that may be away from these refuges at any given time, the number of animals not seen because of turbid water, and other factors. The use of mark-resighting techniques to estimate manatee population size based on known animals in the manatee photo-identification database is also not a statistically and scientifically repeatable method.

It is possible, however, to monitor the number of manatees using the Blue Spring (Volusia County) and Crystal River (Citrus County) warmwater refuges. At Blue Spring (in the Upper St. Johns River Subpopulation), with its unique combination of clear water and confined spring area, it has been possible to count the number of resident animals by identifying individual manatees from scar patterns. The data indicate that this group of animals has increased steadily since the early 1970s when it was first studied. During the 1970s, the number of manatees using the spring increased from 11 to 25 (Bengston 1981). In the mid 1980s, about 50 manatees used the spring (Service 2001), and by the winter of 1999-2000, the number had increased to 147 (Hartley 2001).

In the Northwest Subpopulation, the clear, shallow waters of Kings Bay (Citrus County) have made it possible to monitor the number of manatees using this warmwater refuge at the head of Crystal River. Large aggregations of manatees apparently did not exist there until recent times (Service 2001). The first careful counts were made in the late 1960s. Since then, manatee numbers have increased significantly. From 1967 to 1968, Hartman (1979) counted 38 animals in Kings Bay. By 1981-1982, the maximum winter count had increased to 114 manatees (Powell and Rathbun 1984) and, in November 2000, the maximum count was 301 (J. Kleen, Service, personal communication).

In the Atlantic and Southwest subpopulations, no similar shallow, clear water areas are present that make it possible to monitor the number of manatees using warmwater refugia, although such refugia are present. In these locations, visual counts of those manatees that can be seen by aerial surveys are the basis of the population estimates and estimates of adult survival and population growth.

The only data on population size include uncalibrated indices based on maximum counts of animals at winter refuges made within 1 or 2 days of each other. Based on such information in the late 1980s, the total number of manatees throughout Florida was originally thought to include at least 1,200 animals (Service 2001). Because aerial and ground counts at winter refuges are highly variable depending on the weather, water clarity, manatee behavior, and other factors (Packard et al. 1985; Lefebvre et al. 1995), interpretation of these data to assess short-term trends is difficult (Packard and Mulholland 1983; Garrott et al. 1994).

Beginning in 1991, the State of Florida initiated a statewide, synoptic, aerial survey program to count manatees in potential winter aggregation areas during periods of severe cold weather (Ackerman 1995). The highest statewide minimum count from these surveys was 3,276 manatees in January 2001 with 1,520 individuals on the east coast and 1,756 individuals on the west coast. A more recent survey conducted on January 21-22, 2003, provides a minimum population estimate that includes 3,113 individuals with 1,814 and 1,299 manatees on the east and west coasts, respectively (<http://www.floridamarine.org>).

While aircraft synoptic surveys provide a “best estimate” of the minimum Florida manatee population size, there are no confidence intervals (derived through reliable, statistically based, population-estimation techniques) for these estimates. With the exception of a few places where manatees may aggregate in clear, shallow water, not all manatees can be seen from aircraft because of water turbidity, depth, surface conditions, variable times spent submerged, and other considerations (Lefebvre et al. 1995). While these results are of value in providing information on where manatees occur, likely relative abundance in various areas, and seasonal shifts in manatee abundance, they do not provide good population estimates nor can they reliably measure trends in the manatee population. Consequently, the *Florida Manatee Recovery Plan* (Service 2001) concludes that “despite considerable effort in the early 1980s, scientists have been unable to develop a useful means of estimating or monitoring trends in size of the overall manatee populations in the southeastern United States.”

At the end of winter, manatees leave warmwater aggregation sites and head for warm weather use areas. There appears to be no significant spring aggregation areas on the west coast, although Charlotte Harbor was visited in the spring by almost half of 35 manatees radio-tagged at the Fort Myers Power Plant in Lee County in the early 1980s (Lefebvre and Frohlich 1986). During the summer, manatees can be found throughout Florida where water depths and access channels are greater than 1 to 2 meters (3.3 to 6.6 feet) (O'Shea 1988). Summer use areas are generally typified by extensive foraging resources. Seagrasses and other food sources occur throughout coastal Florida.

Reasons for Legal Protection

In 1967, both the Florida and Antillean subspecies of manatees (*T. manatus latirostris* and *T. manatus manatus*) were listed as endangered (32 FR 4061) and received Federal protection with the passage of the ESA in 1973. However, since the manatee was designated as an endangered species prior to enactment of the ESA, there was no formal listing package identifying threats to the species, as required by section 4(a)(1) of the ESA. However, since that time, threats to the manatee (discussed below) have been identified.

Manatees are also protected under the MMPA. The MMPA establishes, as national policy, maintenance of the health and stability of marine ecosystems and, whenever consistent with this primary objective, obtains and maintains optimum sustainable populations of marine mammals. It also establishes a moratorium on the taking of marine mammals, which includes harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal.

Section 101(a)(5)(A) of the MMPA allows the Service, upon request, to authorize by specific regulation the incidental, unintentional take of marine mammals by persons engaged in identified activities within specific geographic areas, if the Service determines that such taking would have a negligible impact on the species or subpopulation. Since the manatee, which is comprised of the Florida and Antillean manatee subpopulation, is currently listed as "endangered" under the ESA, they are considered "depleted" under the MMPA. Section 115(b) of the MMPA requires that conservation plans be developed for marine mammals considered "depleted." In the case of the Florida manatee, the Service developed the initial recovery plan for the manatee in 1980. This initial plan focused primarily on manatees in Florida, but included Antillean manatees in the Commonwealth of Puerto Rico and the U.S. Virgin Islands. In 1986, the Service adopted a separate recovery plan for manatees in Puerto Rico. To reflect new information and planning needs for manatees in Florida, the Service revised the original plan in 1989 and focused exclusively on the Florida manatee. This first revision covered a 5-year planning period ending in 1994. The Service revised and updated the plan again in 1996, which again covered a 5-year planning period ending in 2000. In 1999, the Service initiated the process to revise the plan for a third time. An 18-member recovery team, consisting of representatives of the public, agencies, and groups that have an interest in manatee recovery and/or could be affected by proposed recovery actions, was established to draft the third revision. The latest manatee recovery plan, which also covers a 5-year planning period, was finalized in October 2001.

Threats

The main threat faced by manatees in Florida is death or serious injury from watercraft strikes. Another threat includes uncertainty in the availability of warmwater refuges as deregulation of the power industry in Florida occurs. Consequences from an increasing human population and intensive coastal development are also long-term threats to the manatee. Their survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population. A viable manatee population includes values that are indicative of a stable or increasing population for the periods of analysis and provides us with additional positive recovery indicators, such as progressively higher minimum counts, increasing adult manatee survival, reproduction (cows with calves), and population growth rates.

The largest identified human cause of manatee deaths is collisions with watercraft and/or propellers of watercraft. Between 1976 and 2002, watercraft-related manatee deaths accounted for 25 percent of the total mortality. Data on manatee deaths in the southeastern United States have been collected since 1974 (O'Shea et al. 1985; Ackerman et al. 1995; FWC unpublished data). Data since 1976 were used in the following summary, as carcass collection efforts were more consistent following that year. These data indicate an increase in manatee deaths over the last 25 years (Ackerman et al. 1995; FWC unpublished data). This is an increase of an average of 7.2 percent per year (Ackerman et al. 1995; FWC unpublished data). Watercraft-related manatee deaths were lower in 1992 and 1993, but increased thereafter. From 1996 to 2002, watercraft-related manatee deaths were the highest on record, which also corresponds to an increase in the manatee population and an increase in registered watercraft.

In a parallel fashion, residential growth and visitation to Florida have increased dramatically. It is expected that Florida will have 83 million visitors annually by the year 2020, up from 48.7 million visitors in 1998. In concert with this increase of human population growth and visitation is the increase in the number of watercraft that travel Florida waterways. In 2002, 961,719 watercraft were registered in the State of Florida (Division of Motor Vehicles 2003). This represents an increase of 59 percent since 1993. The Florida Department of Community Affairs estimates that, in addition to watercraft belonging to Florida residents, between 300,000 and 400,000 watercraft registered in other States use Florida waters each year.

As noted above, there has been an increasing trend in watercraft-related manatee mortality in all four subpopulations over the past decade. This is reflected in increases in the average annual number of watercraft-related manatee mortalities as the period over which the average is taken becomes more recent.

For instance, in the Atlantic Subpopulation, the mean observed mortality due to watercraft was 25.8 deaths per year for the period 1990-1999, 29.8 per year for the period 1993-2002, and 37 per year for the 5-year period from 1998-2002. This trend is statistically significant in all four subpopulations. The slope of the increase (as fit to the period 1992-2002) does not differ between the Upper St. Johns River and Northwest Stocks (5.96 percent) nor does it differ between the Atlantic and Southwest Stocks (9.53 percent). To interpret these mortality rates of increase, however, it is important to compare them to the historic growth rates (1990-1999) in

each subpopulation, to account for the increase in manatee mortalities that would be expected due to increases in manatee population size. In the Atlantic and Southwest Stocks, the rate of increase in watercraft-related manatee mortality over that period exceeded the estimated growth rate of those populations (by 8.5 percent in the Atlantic and 10.6 percent in the Southwest). In the Northwest Subpopulation, the rate of increase in mortality (6.0 percent) is somewhat larger than the estimated growth rate (3.7 percent).

The next largest human-related cause of manatee deaths is entrapment or crushing in water control structures and navigational locks, and this accounts for approximately 4 percent of the total mortalities recorded between 1976 and 2002 (Ackerman et al. 1995; FWC unpublished data). These deaths were first recognized in the 1970s (Odell and Reynolds 1979), and steps have been taken to eliminate this source of mortality. Beginning first in the early 1980s, gate-opening procedures were modified. Annual numbers of deaths initially decreased after this modification. However, the number of deaths subsequently increased and, in 1994, a record 16 deaths were documented. Manatee mortality decreased during 2000-2002 with 14 manatee mortalities for the 3-year period. An ad hoc interagency task force was established in the early 1990s and now includes representatives from the South Florida Water Management District, Corps, Service, Miami-Dade Department of Environmental Research Management, FWC and the DEP. This group meets annually to discuss recent manatee deaths and develop measures to protect manatees at water control structures and navigational locks as well as to prevent entrapment in culverts and pipes. The overall goal is to eliminate structure-related manatee deaths.

Other known causes of human-related manatee deaths include poaching and vandalism, entanglement in shrimp nets, monofilament line (and other fishing gear), and ingestion of debris. These account for about 3 percent of the total mortality from 1976 to 2002. Together, deaths attributable to these causes have remained constant and have accounted for a low percentage of total known deaths, *i.e.*, about 4 percent between 1976 and 1980, 3 percent between 1981 and 1985, 2 percent between 1986 and 1991, and 2 percent between 1992 and 2002 (Ackerman et al. 1995; FWC unpublished data). Entrapment in shrimp nets is the largest component of this category. Eleven deaths between 1976 and 1998 (seven in Florida, four in other states) were thought to be related to shrimping activities (Nill 1998). These deaths have become less common since regulations on inshore shrimping, the 1995 Florida Net Ban regulations, and education efforts about protecting manatees were implemented.

These data on causes of manatee mortality, particularly the increasing number of watercraft-related manatee deaths, should be viewed in the context of Florida's growing human population, which increased by 130 percent since 1970, from 6.8 to 15.7 million people (Florida Office of Economic and Demographic Research 2001). The rise in manatee deaths during this period is, at least in part, the result of the increasing numbers of people and watercraft sharing the same waterways.

Human activity has other effects on manatees besides direct mortality. Dredge and fill activities, polluted runoff, and propeller scarring have resulted in the loss of vegetated areas. Quiet backwaters have been made more accessible to human activities, and increasing levels of vessel

traffic have made manatees increasingly vulnerable to watercraft collisions in travel corridors. For example, industrial warmwater discharges and deep-dredged areas are now used as wintering sites, stormwater pipes and freshwater discharges in marinas provide manatees with drinking water, and the imported exotic plant, hydrilla (*Hydrilla verticillata*, which has supplanted native aquatic species), has become an important food source at wintering sites.

While some changes substitute for natural biological needs, some activities have an adverse effect on the species. The loss of industrial warmwater discharges can result in the deaths of individuals using these sites. Other activities may also affect manatees, albeit on a much more subtle level. Harassment by watercraft and swimmers may drive animals away from preferred natal areas and winter refugia, and the loss of vegetation in certain areas (*e.g.*, winter foraging areas) may require manatees to travel greater distances to feed. The impact of these kinds of activities on the survival, recovery, and mortality of the species is not fully understood.

Natural causes of death include disease, parasitism, reproductive complications, and other nonhuman-related injuries as well as occasional exposure to cold and red tide (O'Shea et al. 1985; Ackerman et al. 1995). These natural causes of death accounted for 13 percent of all deaths between 1976 and 2002 (FWC unpublished data). Perinatal deaths accounted for 20 percent of all deaths in the same period. A prominent natural cause of death in some years is exposure to cold. Following a severe winter cold spell at the end of 1989, at least 46 manatee carcasses were recovered in 1990; cause of death for each was attributed to cold stress. Exposure to cold is believed to have caused many deaths in the winters of 1977, 1981, 1984, 1990, 1996, and 2001; and have been documented as early as the 19th century (Ackerman et al. 1995; O'Shea et al. 1985; FWC unpublished data).

In 1982, a large number of manatees also died coincidentally with a red tide dinoflagellate (*Gymnodinium breve*) outbreak between February and March in Lee County, Florida (O'Shea et al. 1991). At least 37 manatees died, perhaps in part, due to incidental ingestion of filter-feeding tunicates that had accumulated the neurotoxin-producing dinoflagellates responsible for causing the red tide. In 1996, from March to May, at least 149 manatees died in a red tide event over a larger region of southwest Florida (Bossart et al. 1998; Landsberg and Steidinger 1998). Although the exact mechanism of manatee exposure to the red tide brevetoxin is unknown in the 1982 and 1996 outbreaks, ingestion, inhalation, or both are suspected (Bossart et al. 1998). Since January 2003, the current red tide outbreak has been responsible for the deaths of 75 manatees (<http://www.floridamarine.org>). The critical circumstances contributing to red tide-related deaths are concentration and distribution of the red tide, timing and scale of manatee aggregations, salinity, and timing and persistence of the outbreak (Landsberg and Steidinger 1998).

Perinatal deaths include aborted fetuses, stillborn, or those that die of natural causes within a few days of birth. Some may die from disease, reproductive complications, and/or congenital abnormalities. The cause of many perinatal deaths cannot be determined, because these carcasses are generally in an advanced state of decomposition at the time of recovery. Additionally, watercraft-related manatee injuries or disturbance or other human-related factors affecting pregnant and nursing mothers may also be responsible for some of the perinatal deaths.

It has been suggested that some may die from harassment by adult males (O'Shea and Hartley 1995). Between 1976 and 2002, perinatal deaths increased at an average of 9.2 percent per year (Ackerman et al. 1995; FWC unpublished data).

Status and distribution of the Atlantic Subpopulation

The project discussed in this biological opinion is located in waters accessible to the Atlantic Subpopulation of manatees. The Atlantic Subpopulation of manatees in Florida includes all areas of Nassau, Brevard, Indian River, St. Lucie, Martin, Palm Beach, Broward, Miami-Dade, and northern Monroe Counties accessible to manatees. The Atlantic Subpopulation also includes the coastal waters of Duval, St. Johns, Flagler, and Volusia Counties accessible to manatees.

Rangewide trend of the Atlantic Subpopulation

Manatee distribution and dispersal patterns, and numbers of individuals within an area, can vary considerably from year to year, and season to season. This variability in dispersal patterns is dependent on a variety of biotic and abiotic factors, such as warmwater discharges, freshwater supplies, high quality feeding areas, and mating season. As an example, recent synoptic winter survey data for manatee counts in Brevard County varied from 230 manatees in the February 4-5, 1999, survey event to a count of 790 in the March 17-18, 1999, survey event. Surveys in the same area in the previous year provided a count of 336 manatees in February and 680 manatees in March. Variability in summer synoptic survey counts for this area is similar: in the July 8-10, 1998, event, 137 manatees were counted. A month later, in the August 4-5, 1998, event, the manatee count was 243 individuals. Similar manatee distributional patterns were also observed in the synoptic survey data for Miami-Dade County. Average winter survey counts in Miami-Dade County (November through April 1996 to 1999) ranged from a low of 28 to a high of 117 manatees. Average summer synoptic surveys (May through October 1996 to 1999) ranged from a low of 13 to a high of 28 manatees in Miami-Dade County.

In recent years, the most important spring habitat along the east coast of Florida has been the northern Banana River and Indian River Lagoon and their associated waters in Brevard County; more than 300 to 500 manatees have been counted in this area shortly before dispersing in late spring (Provancha and Provancha 1988; FWC unpublished data).

The MPSWG indicates that the Atlantic Subpopulation, which makes up approximately 42 percent of the total population, appears to have been growing slowly during the 1980s and may have leveled off in the 1990s. On the east coast of Florida, progressively higher minimum counts of manatees were recorded in 1992, 1995, 1996, 2001, and 2003. Population statistics for adult manatee survival, reproduction (cows with calves), and population growth rate have been published for the manatee population using data from the late 1970s, 1980s, and early 1990s. All of these values are indicative of a stable or increasing population for the periods of analysis and provide positive recovery indicators.

The Service agrees with the current status statement of the Atlantic Subpopulation presented by the MPSWG. However, we also believe that the other qualitative information warrants consideration in developing a complete view of the overall status of the subpopulation. We believe that there are more manatees now than there were in the 1970s and 1980s. However, this does not mean that the threats have been reduced.

Threats to the Atlantic Subpopulation

Data on manatee deaths in the Atlantic Subpopulation have been collected since 1974 (O'Shea et al. 1985; Ackerman et al. 1995; FWC unpublished data). Data since 1976 were used in the following summary as carcass collection efforts were more consistent following that year. These data indicate an increase in manatee deaths over the last 26 years. Most of the increase can be attributed to increases in watercraft-related and perinatal deaths (MMC 1993).

Between 1976 and 2002, 2,419 manatee deaths were recorded within the Atlantic Subpopulation. The cause of death categories include watercraft, flood gate/canal lock, other human causes, perinatal, cold stress, natural, and undetermined. Death category quantities are as follows: watercraft, 635; flood gate/canal lock, 118; other human causes, 79; perinatal, 513; cold stress, 109; natural, 227; and undetermined, 738.

Other threats include uncertainty in the availability of warmwater refuges as deregulation of the power industry in Florida occurs. We believe that an increasing human population and intensive coastal development are long-term threats to the manatee, and that manatee survival will depend on maintaining the integrity of ecosystems and habitat sufficient to support a viable manatee population in the midst of this growing human population. As Florida's human population increases, particularly in coastal counties, threats to submerged aquatic vegetation communities will increase. These submerged aquatic vegetation communities are an important component in the survival and recovery of the manatee. The combined effects of propeller scarring of seagrasses, water pollution from stormwater discharges, new docks, dredging, and filling will further degrade seagrasses. These activities will continue to degrade habitat that provides foraging opportunities for manatees.

Manatee Protection Plans

Concerned with an increased number of manatee mortalities and boating accidents, the Governor and Cabinet directed the Florida Department of Natural Resources (DNR) in June 1989 to make recommendations for specific actions to protect the manatee and its habitat and to make the State's waterways safer for the boating public. DNR's final report, *Recommendations to Improve Boating Safety and Manatee Protection on Florida Waterways*, found that over 80 percent of all watercraft-related manatee mortality occurred in ten counties: Brevard, Broward, Citrus, Collier, Dade (now Miami-Dade), Duval, Lee, Martin, Palm Beach, and Volusia. Though watercraft-related mortality was not high for St. Lucie, Indian River, and Sarasota, these three counties were considered important areas as travel corridors as well as foraging and resting areas for manatees.

The Governor and Cabinet directed each of these 13 coastal (= key) counties to develop a Manatee Protection Plan (MPP). The purpose of a MPP is to present a summary of existing information about manatee use and watercraft use within the county and to develop strategies to balance manatee protection, resource protection, waterway uses, boating facility siting, speed zones and signage, boating safety, and educate the boating public. The final report recommended new or expanded boating facilities in these key counties should be limited to one powerboat slip per 100 linear feet of shoreline (the 1:100 ratio) until the county implements its State-approved MPP, including a boating facility siting component. Watercraft access projects that are consistent with a county's MPP provides a level of boater access and activity that is within the capacity of the manatee protection measures provided. Projects that are not consistent with a MPP may exceed the capacity of the protective measures and, therefore, may result in incidental take of manatees. Countywide MPPs are identified in the *Florida Manatee Recovery Plan* (Service 2001) as a method for protecting manatees and manatee habitat.

Citrus County was the first County to have a State-approved MPP in 1991. The MPP identified actions that address manatee mortality and included a marine facility siting plan. The MPP also discusses conservation measures to protect manatee habitat. Subsequent to its approval, the State established regulatory speed zones for watercraft. The State of Florida subsequently approved MPPs for Collier County in May 1995 followed by Miami-Dade County in December 1995; Duval County in June 1999; Indian River County in August 2000 which was amended in February 2002; St. Lucie County in March 2002; Martin County in June 2002; and Brevard County in February 2003. The State is presently reviewing portions of Lee and Broward Counties' revised MPPs as well as Sarasota County's recently submitted MPP.

The Service believes that county MPPs are one of the best vehicles to address such issues as boating facilities (*e.g.*, marinas, docks, boat ramps, dry storage areas); boating activity patterns; manatee information; a boat facility siting plan; manatee protection measures; and an education and awareness program for the boating public. They are valuable planning tools and provide an excellent venue for local manatee protection efforts. In addition, it is our view that an effective MPP must contain components that address manatee protection areas (*e.g.*, manatee refuges), speed zone enforcement, funding for manatee protection efforts, and a reporting/monitoring element. Implementation of a State-approved MPP will have met State standards and addressed our concerns in maximizing benefits to the manatee while providing regulatory certainty to the public.

Analysis of the species/critical habitat likely to be affected

This proposed project will not provide increased watercraft access in the area. However, the demolition of the old bridge has the potential to cause harm or harassment to the manatee. As such the Corps has determined that the proposed project "may affect" the manatee. We acknowledged the Corps' determination, and have engaged in formal consultation in an effort to provide a more complete analysis of the effects of the proposed action in order to determine whether or not the proposed activities are likely to jeopardize the continued existence of the manatee through impacts to the Atlantic Subpopulation.

The removal of the Lake Surprise Causeway and the demolition of the existing bridge and the construction of the new bridge over Lake Surprise and Jewfish Creek will likely affect the manatee by adversely affecting submerged aquatic resources (*i.e.*, seagrasses). The analysis of the proposed activities will be considered further in the remaining sections of this document.

ENVIRONMENTAL BASELINE

This section analyzes all past and ongoing human and natural factors leading to the current status of the manatee in the action area. In the previous discussion of the threats to the species, the Service identified specific human related actions that combined have both negative and positive benefits to the manatee, and the Service believes that the best method to address these threats is through a basic geographic analysis area process.

The project analyzed in this document is located in Miami-Dade County and Monroe County, Florida. After reviewing the Corps' Reach Characterization Analysis (2001), we have determined that: the southern portion of Reach 3, all of Reach 2, and the northern portion of Reach 1 occur within Miami-Dade County; and the southern portion of Reach 1 and all of Reach 25 occur within Monroe County. This biological opinion will address all relevant biological and physical factors that may affect the manatee, resulting from the construction of this project.

Consultation was initiated on this project, and the Service evaluated the specific conditions of the areas expected to be affected by this project to determine whether this project is likely to result in incidental take of manatees. If this analysis determines that incidental take is likely, the Service would normally issue a biological opinion with an incidental take statement. However, the Service cannot provide an incidental take statement for a facility under the ESA until and unless incidental take is authorized under the MMPA. If a special regulation is promulgated that authorizes incidental take under the MMPA, then we would consider this information in our determination as to whether incidental take could be authorized under the ESA. However, it is ultimately the Corps' responsibility to decide whether or not to issue a permit.

As indicated in the threats section, powerboats are a potential hazard to the manatee. Manatees are known to occur within Jewfish Creek and Lake Surprise, and powerboats are known to operate in these areas. The Atlantic Intracoastal Waterway (AIW) occurs west of Lake Surprise within Barnes Sound, Jewfish Creek, and Blackwater Sound. Currently, there are no designated manatee speed zones located within Barnes Sound and Blackwater Sound. Jewfish Creek is posted as "no wake" within 100 feet of either side of the existing bascule bridge. Lake Surprise east of the existing causeway has been designated as "no wake" by the Florida Keys National Marine Sanctuary. The propose removal of the Lake Surprise Causeway, and the removal and reconstruction of the bridges over Lake Surprise and Jewfish Creek are not expected to change patterns of watercraft use in the project area.

The Service also considered impacts from alteration of manatee habitat through activities associated with the removal of the Lake Surprise Causeway and removal and construction of bridges over Jewfish Creek and Lake Surprise, and potential direct harm or harassment of manatees during construction activities. The anticipated direct impacts to manatee habitat are

addressed by seagrass mitigation proposed by the applicant. Direct impacts to manatees during construction are dealt with through application of the *Standard Manatee Protection Construction Conditions*, which are routinely included as conditions of Department of the Army permits issued for construction projects in manatee habitat.

ACTION AREA

The proposed project is located within or adjacent to the waters of Barnes Sound, Lake Surprise, Jewfish Creek, and Blackwater Sound. Vessels using these waters usually travel within the AIW to access Florida Bay, Biscayne Bay, and the Atlantic Ocean. These waters closely correspond to the area defined as Reach 1 and Reach 25 by the Corps' Reach Characterization for Florida waters (Corps 2001). Therefore, for the purposes of this consultation, the Service defines the action area for this biological opinion as all waters within Reach 1 and Reach 25.

Status of the species within the action area

The Atlantic Subpopulation of manatees migrate to and through the action area. Manatee distribution and dispersal patterns, and numbers of individuals within an area, can vary considerably from year-to-year and season-to-season. This variability in dispersal patterns is dependent on a variety of biotic and abiotic factors, such as warmwater discharges, freshwater supplies, high quality feeding areas, and mating season.

During January 2003, there were three synoptic aerial surveys covering Florida. A total of 1,695; 1,814; and 1,705 manatees were observed along the east coast of Florida. These surveys did not delineate how many of those manatees were seen within the action area.

Designated manatee critical habitat occurs within the action area within Barnes Sound, Blackwater Sound, Little Blackwater Sound, and Card Sound, and Florida Bay. A warmwater refugium occurs within the action area. Manatees are known to congregate during cold spells approximately 16.4 miles northeast of the project site the Florida Power and Light Turkey Point Power Plant during winter cold spells. The plant discharges warmwater resulting from the generation of electricity.

Factors affecting species environment within the action area

Watercraft-related death and serious injury is an important human-related factor affecting manatees. Between 1974 and 2002, 385 manatee deaths were recorded within Miami-Dade County and Monroe County. The cause of death categories include watercraft, flood gate/canal lock, other human causes, perinatal, cold stress, natural, and undetermined. Death category quantities are as follows:

watercraft	gate/lock	other human	perinatal	cold stress	natural	undetermined
75	71	31	37	4	25	152

The potential long-term effect of continued growth of Miami-Dade County's and Monroe County's human population on the quality of coastal ecosystems is another factor affecting the manatee. As the human population increases, particularly in the coastal areas, threats to submerged aquatic vegetation communities will increase. These submerged aquatic vegetation communities are an important component in the survival and recovery of the manatee. The combined effects of propeller scarring of seagrasses, water pollution from stormwater discharges, new docks, dredging, and filling will further degrade seagrasses. These activities will continue to degrade habitat that provides foraging opportunities for manatees.

Miami-Dade County adopted manatee speed zones in October 1991. Florida Administrative Code 68C-22.010 establishes manatee speed zones on Miami-Dade County waterways. The zones were established for the purpose of regulating the speed and operation of motorboats within Miami-Dade County, including all associated and navigable tributaries, lakes, creeks, coves, bends, backwaters, canals, channels and boat basins, unless otherwise designated or excluded. Waters of Miami-Dade County are designated as "Idle Speed," "Slow Speed," and "25 mph." Waters of Monroe County do not contain designated manatee speed zones. In addition, waters adjacent to the project site do not contain designated manatee speed zones.

All Miami-Dade County posted manatee speed zone signs are in compliance with both the State-approved design parameters and Chapter 68D-23 "Uniform Waterway Markers in Florida Waters." The intent of Chapter 68D-23 is to provide for uniformity in design, construction and coloring of markers so that all vessel operators may readily recognize, identify and distinguish between authorized markers and unlawfully placed markers, and to provide a means by which the FWC law enforcement officers and all other law enforcement officers charged with the enforcement of this chapter may determine with reasonable certainty which boating areas are lawfully established and marked. For more detail on manatee speed zones in Miami-Dade County see <http://floridaconservation.org/psm/gis/mapref.htm>.

Commercial and recreational boat use in the action area appears to be increasing. According to information provided by the State of Florida, a total of 53,290 vessels were registered in Miami-Dade County and 25,862 in Monroe County in 2000. The number of registered vessels increased to 57,776 and 29,525 in 2003, respectively.

EFFECTS OF THE ACTIONS

This section includes an analysis of the direct and indirect effects of the proposed action on the manatee and its interrelated and interdependent activities.

Factors to be considered

New watercraft access projects may have a number of direct and indirect effects on manatees and manatee habitat. Direct impacts include alteration of manatee habitat through dredge and fill activities associated with construction of the development and potential direct harm or harassment of manatees during construction activities. Anticipated direct impacts to habitat are addressed through modifications in the project design during the permit review process. Direct

impacts to manatees during construction are dealt with through application of the *Standard Manatee Protection Construction Conditions*, which are routinely included as conditions of Department of the Army permits issued for construction projects in manatee habitat.

Indirect effects include effects to manatees and manatee habitat caused by operation of the facilities. Construction of new bridge projects could provide increased access by watercraft to areas frequented by manatees or may alter watercraft traffic patterns in such a way as to increase watercraft-manatee interactions. This may lead to increased harassment of manatees or increased watercraft collisions with manatees. Depending on the location of the project, construction of bridge projects may encourage boats to travel through important manatee habitat features such as submerged aquatic vegetation beds and warmwater refugia; thereby potentially altering manatee habitat and manatee habitat use patterns.

This project is located in proximity to areas that are occupied by the manatee in Miami-Dade and Monroe Counties. This project is located within the south central portion of the geographic range of the Atlantic Subpopulation of the manatee. The timing of construction for this project (when it will be constructed) as it relates to sensitive periods of the manatee's life cycle is unknown. Manatees may be found adjacent to the proposed construction footprint during the spring, summer, and fall. Due to cooler water temperatures generally present during mid-winter, there is a significantly lower likelihood that manatees will be adjacent to the construction footprint. There is a high probability that during the cooler months manatees will be present at the Florida Power and Light Port Turkey Point Power Plant. The project will be constructed in a single, disruptive event, followed by perpetual activities, such as maintenance of the bridge structures. The entire construction sequence is expected to be completed within a year. Although construction personnel will be cautioned about the possible presence of manatees in the project area, physical contact or harassment of manatees is still possible.

Analyses for Effects of the Actions

The Corps has determined that the proposed project is located within Reach 1 and Reach 25 as defined by the Corps' Reach Characterization Analysis. Furthermore, the Corps has determined that all projects within Reach 1 and Reach 25 may cause an increased risk to the manatee due to several reach characteristics including: (1) the presence of critical habitat; (2) the attractive shape of the reach for high speed boat use; (3) the high extent of shallowness in high speed boat areas; (4) the high amount of seagrass in the high speed boat area; (5) the very high amount of seagrass between the shoreline and open channel; (6) the high dock and boating density; and (7) the reach is close to a manatee aggregation area.

Beneficial Effects – The applicant proposes to remove the existing Lake Surprise Causeway and restore seagrasses in the Causeway foot print. An additional 5.2 acres of manatee foraging habitat will be created. Furthermore, the proposed causeway removal is expected to improve water quality in Lake Surprise and benefit the manatee by improving existing foraging habitat.

Direct Effects - Direct effects are those effects that are caused by the proposed action, at the time of construction, and are reasonably certain to occur. The direct effects that this project will have

on the manatee and its critical habitat within the action area include noise from barge operation and construction equipment; in-water movement of construction equipment and work watercraft; removing, replacing and securing dock support structures and mooring piles; and barge ingress and egress to the construction site. Explosives will not be used in removal of the existing the C-111 bridge, the Jewfish Creek Bridge, and the Lake Surprise Causeway.

To reduce potential construction-related impacts to the manatee and critical habitat, the Corps has agreed to include as a condition of the permit, if issued, the *Standard Manatee Construction Conditions* (FWC 2001), which are as follows:

The permittee shall comply with the following manatee protection construction conditions:

- a. The permittee shall instruct all personnel associated with the project of 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. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the MMPA of 1972, the ESA of 1973, and the Florida Manatee Sanctuary Act.
- c. Siltation barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.
- d. All vessels associated with the construction project shall operate at “no wake/idle” speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a 4-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- e. If manatee(s) are seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet to a manatee. Operation of any equipment closer than 50 feet to 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.
- f. Any collision with and/or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-772-562-3909) in south Florida.
- g. Temporary signs concerning manatees shall be posted prior to and during all construction/dredging activities. All signs are to be removed by the permittee upon completion of the project. A sign measuring at least 3 feet by 4 feet which reads

Caution: Manatee Area will be posted in a location prominently visible to water-related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8-1/2" by 11" which reads *Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. Any collision with and/or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. The U.S. Fish and Wildlife Service should also be contacted in Jacksonville (1-904-232-2580) for north Florida or in Vero Beach (1-772-562-3909) for south Florida.*

With the incorporation of the above *Standard Manatee Construction Conditions* (FWC 2001) into the project permit by the Corps, the Service believes that the construction of the project will not directly affect the manatee.

Interrelated and Interdependent Actions - There are no interdependent or interrelated actions associated with the proposed activity that is expected to impact manatees.

Indirect Effects –Indirect effects are those that are caused by or the result of the proposed action, are later in time, and are reasonably certain to occur. With respect to the proposed project, this would include a change in watercraft movement patterns or an increase in watercraft traffic in the project area resulting in increased watercraft related manatee mortality. Watercraft-related manatee mortality was assessed for the action area. Between 1992 and 2003, 15 watercraft-related manatee deaths were recorded within Reach 1 in Miami-Dade County, including 0 in 2000, 3 in 2001, and 3 in 2002, and 2 in 2003. No watercraft-related manatee deaths have been recorded in Miami-Dade County during 2004. Between 1992 and 2003, 51 watercraft-related manatee deaths were recorded within Reach 4 in Monroe County, including 1 in 2000, 2 in 2001, and 2 in 2002, and 0 in 2003. No watercraft-related manatee deaths have been recorded in Monroe County during 2004.

We also assessed watercraft-related manatee mortalities from January 2001 to the present within the subset of the action area that includes the waters of the AIW, Card Sound, Blackwater Sound, and Florida Bay from Card Sound Road to Plantation Key. This subset included the travel routes that would most likely be used by boaters in the project area. No watercraft-related manatee deaths were recorded within this portion of the AIW from 1999 through 2003. Based on this analysis, it does not appear that the rate of watercraft-related manatee mortality is increasing significantly in this subset of the action area. In addition, the proposed project is not expected to change watercraft use patterns or increase watercraft traffic in the action area. The majority of boat traffic will still occur within the AIW and boaters will still be required to observe the “no wake” zone within 100 feet of the new bridge structure over Jewfish Creek. Consequently, it is our view that there are no indirect effects associated with construction of the proposed project.

Species response to the proposed action

The number of manatees that may occur in the vicinity of the proposed project is unknown; however, we expect that number to represent a small percentage of the animals within the

Atlantic Subpopulation, based on the locations and distribution of seagrasses and warmwater refugia on the east coast. Manatees are sensitive to, less resilient of, and less likely to recover from significant disturbances to themselves and/or their habitat. However, we do not consider the project, as proposed, to represent a threat of disturbance to these animals.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are not considered in this section because they require separate consultation under section 7 of the ESA. The Service has considered cumulative effects within the action area and, based on the above discussion, we have not identified any additional cumulative effects beyond those already discussed.

CONCLUSION

After reviewing the current status of the manatee, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the manatee and is not likely to adversely modify critical habitat. Our conclusion is based on the fact that this project will not increase watercraft access nor change watercraft use patterns in the area.

INCIDENTAL TAKE STATEMENT

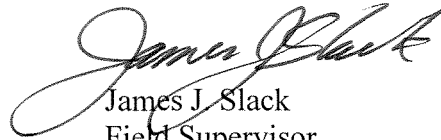
The Service does not anticipate that the proposed action will result in the incidental take of manatees. Furthermore, the Service is not including an incidental take authorization for marine mammals at this time because the incidental take of marine mammals is not expected to occur and has not been authorized under section 101(a)(5) of the MMPA and/or its 1994 Amendments. Following issuance of such regulations or authorizations, the Service may amend this biological opinion to include an incidental take statement for marine mammals, as appropriate.

REINITIATION NOTICE

This concludes section 7 consultation on the proposed issuance of Corps permits for the project. As provided in 50 CFR 402.15, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained and if: (1) the amount of incidental take is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered by this consultation, (3) the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered by this consultation, or (4) a federally listed species or its critical habitat not addressed in this biological opinion may be affected by the action. In instances where incidental take occurs, any operations causing such take must cease pending reinitiation.

Thank you for your cooperation and effort in protecting fish and wildlife resources. If you have any questions regarding this project, please contact Allen Webb at 772-562-3909, extension 246.

Sincerely yours,



James J. Slack
Field Supervisor
South Florida Ecological Services Office

cc:

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