United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

February 5, 2007

Colonel Paul L. Grosskruger
District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

Dear Colonel Grosskruger:

This document is the Fish and Wildlife Service's (Service) biological opinion for docking facilities in Lee County, Florida. The biological opinion addresses potential effects of the projects on the West Indian (= Florida) manatee (*Trichechus manatus*) (manatee), in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*), the Marine Mammal Protection Act of 1972, as amended (MMPA) (16 U.S.C. 1361 *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.*).

Service Consultation Code	Corps Application Number	New Boat Slips	Date Received	Applicants
41420-2006-F-0438	SAJ-2006-3186 (GP-MJD)	1	6/20/2006	White Knight Construction
41420-2006-F-0867	SAJ-2005-10877 (GP-PW)	2	9/06/2006	Julian H.L. Stokes

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* (MSRP) (Service 1999), data supplied by the Florida Fish and Wildlife Conservation Commission (FWC), Florida Wildlife Research Institute (FWRI) 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.

The dock projects are located within an area of concern in the vicinity of Bokeelia. The Bokeelia area averaged 0.7 watercraft-related manatee deaths per year from 1996 to 2006. Based on the number of watercraft-related manatee mortalities for the past 10 years and the lack of manatee speed zones, signage, and enforcement, the Service believes that take of manatees is reasonably certain to occur from watercraft activities associated with the authorization of new watercraft access projects in this area.

Consultation History

The Service examined the July 2005 version of the Corps' Manatee Key along with its attachments and agrees with its structure and content. Service concurrence for the Manatee Key was provided in letters to the Corps dated July 12, 2005, September 30, 2005, and August 28, 2006. Based on implementation of Interim II and the effects determination procedure described in the Manatee Key, the Service has sufficient information to conduct formal consultation for the proposed docking facilities.

The Service acknowledges the Corps' determination of "may affect" for the manatee.

FISH AND WILDLIFE RESOURCES

Based on the information provided, the Service believes the proposed activities will not significantly impact fish and wildlife habitat resources.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTIONS

White Knight Construction on behalf of Alvin Saeger proposes to construct a 6-foot by 30-foot marginal platform. The proposed work will create one new boat slip. The Corps has assigned application number SAJ-2006-3186 (GP-MJD) to this project. The proposed project is located at 16173 Buccaneer Street on Pine Island, Section 30, Township 43 South, Range 22 East, Lee County (County), Florida.

Julian H.L. Stokes proposes to construct a 4-foot by 320-foot access pier with an 8-foot by 20-foot terminal platform. The proposed work will create two new boat slips. The Corps has assigned application number SAJ-2005-10877 (GP-PW) to this project. The proposed project is located at 16490 Stringfellow Road on Pine Island, Section 30, Township 43 South, Range 22 East, Lee County (County), Florida.

To reduce direct construction-related impacts to the manatee, the Corps has agreed to include as condition of the permit the *Standard Manatee Construction Conditions* (FWC 2005). Seagrasses, if present, are avoided through modifications in the project design during the permit review process and/or the application of *Dock Construction Guidelines for Florida* developed by the Corps and the National Marine Fisheries Service (NOAA Fisheries 2001) (Corps and NOAA Fisheries 2001).

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 they can hear sounds within a relatively narrow low frequency range, their hearing is not acute, and they have difficulty in localizing sound (Ketten et al. 1992). However, Gerstein (1995) suggested manatees may have 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 Act, 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 [Act §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 including the areas 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 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 total population size of manatees in Florida is unknown. Annual synoptic surveys suggest a minimum population of 3,000 animals statewide. Adult manatee survival rates are considered to be the most important indicator of maintaining a stable and secure manatee population. Given the low reproductive rate, manatee populations would be slow to recover from extensive depletions of their numbers.

Status and Distribution

Based on telemetry studies, aerial surveys, photo identification studies, and other research over the past 30 years, manatee distribution in the southeastern United States is now well known (Beeler and O'Shea 1988; Fertl et al. 2005; Lefebvre et al. 1995; Rathbun et al. 1982; Schwartz 1995). 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 warm water from industrial discharges and natural springs for warmth.

There are four regional management units of manatees in Florida: (a) the Northwest Region, along the Gulf of Mexico from Escambia County east and south to Hernando County; (b) the Upper St. Johns River Region, consisting of Putnam County from Palatka south to Lake and Seminole counties; (c) the Atlantic Coastal Region, consisting of counties along the Atlantic coast from Nassau County south to Miami-Dade County and that portion of Monroe County adjacent to the Florida Bay and the Florida Keys; and counties along the lower portion of the St. Johns River north of Palatka, including Putnam, St. Johns, Clay and Duval counties; and (d) the Southwest Region, consisting of counties along the Gulf of Mexico from Pasco County south to Whitewater Bay in Monroe County. The largest numbers of manatees, comprising perhaps 80 percent of the manatee population in Florida, are found in the Atlantic Coast and Southwest regions. The Northwest and Upper St. Johns River units comprise about 20 percent of the population. Manatees in the Northwest, Upper St. Johns River and Atlantic Coastal regions are exhibiting positive growth, however those in the Southwest region appear to be in decline, probably due to the combined effects of watercraft mortality and episodic red-tide events (Craig and Reynolds 2004; Runge et al. 2004; Langtimm et al. 2004; K. Langtimm personal communication 2006).

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 Act in 1973. However, since the manatee was designated as an endangered species prior to enactment of the Act, there was no formal listing package identifying threats to the species, as required by section 4(a)(1) of the Act. 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 such taking would have a negligible impact on the species or subpopulation. Since the manatee, which is comprised of the Florida and Antillean manatee subpopulations, is currently listed as "endangered" under the Act, 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 United States 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 two most significant threats to the Florida manatee population statewide are collisions with watercraft and the loss of warm water habitat. All other threats are relatively minor in comparison. Mortality from watercraft collisions accounts for 25-33 percent of all manatee mortalities statewide (FWC and FWRI 2006). Warm water habitat is essential for manatee survival during cold weather. Prolonged exposure to cold water temperatures can result in debilitation and/or death due to "cold stress syndrome" (Bossart et al. 2004; Rommel et al.

2001). However, when compared to all other threats, including the loss of warm water habitat, watercraft-related mortality poses the most serious long-term risk to the growth and resilience of the manatee population.

Other threats to manatees include crushing or entrapment in gates and locks, entanglement in ropes, lines, and nets, ingestion of fishing gear or debris, vandalism, poaching, and exposure to red tide brevetoxin (Bossart et al. 1998).

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 over 80 percent of all watercraft-related manatee mortality occurred in 10 counties: Brevard, Broward, Citrus, Collier, Miami-Dade, Duval, Lee, Martin, Palm Beach, and Volusia. Though watercraft-related mortality was not high for St. Lucie and Indian River Counties, these counties were considered important as travel corridors as well as foraging and resting areas for manatees. Sarasota County volunteered to be the 13th county and was included because it too provided on the west coast the same important use areas that St. Lucie and Indian River counties did on the east coast.

Subsequent to this report, the Governor and Cabinet directed each of these 13 coastal (= key) counties to develop an MPP. The purpose of an 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 to 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 consistent with a county's MPP provides levels of boater access and activities within the capacity of the manatee protection measures established. Projects not consistent with an MPP may exceed the capacity of these 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 county's MPP identified actions that address manatee mortality and included a boating facility siting plan. The MPP also discussed 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 and in August 2004; St. Lucie County in March 2002; Martin County in June 2002; Brevard County in February 2003; Sarasota County in February 2004; Lee County in August 2004; and Volusia County in October 2005.

The Service believes county MPPs are one of the best vehicles to address such issues as boating facilities (marinas, docks, boat ramps, and 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 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

Due to the increase in the number of watercraft resulting from the proposed actions the Corps has determined the proposed projects "may affect" the manatee. We acknowledged the Corps' determination, and as directed by our January 14, 2003, memorandum have engaged in formal consultation in an effort to provide a more complete analysis of the effects of the proposed actions in order to determine whether or not the proposed activities are likely to jeopardize the continued existence of the manatee.

The construction of these docks will likely affect the manatee and its critical habitat by increasing watercraft in the action area, and increasing the potential to adversely affect submerged aquatic resources (*i.e.*, seagrasses). An analysis of increased watercraft access and impacts to seagrasses will be considered further in the remaining sections of this document.

ENVIRONMENTAL BASELINE

Consultation was initiated on these projects, and the Service evaluated the specific conditions of the areas expected to be affected by the projects to determine whether the projects are likely to result in incidental take of manatees. If this analysis determines 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 Act until and unless incidental take is authorized under 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 Act. However, it is ultimately the Corps' responsibility to decide whether or not to issue a permit.

The projects analyzed in this document are located in Lee County, Florida. The action area is defined as all areas affected directly and indirectly by the Federal action and not merely the immediate area involved in the action. The proposed projects are located within the Bokeelia area in Reach 33. Vessels using the new docking facilities would likely travel through Matlacha Pass, Pine Island Sound, Charlotte Harbor, or San Carlos Bay, to the Gulf of Mexico. These waters closely correspond to the area defined as Reach 33 by the Corps' Reach Characterization for Florida waters (Corps 2001).

The importance and significance of the posting of speed zones and appropriate signage is seen in the enforcement of the zones by law enforcement officers and increased compliance by local boaters. Law enforcement officers from the Lee County Sheriff's Office as well as the cities of Fort Myers and Cape Coral enforce posted speed zones. The Service's Division of Law Enforcement also provides speed zone enforcement through special task force events. The law enforcement officers (special agents, refuge officers) target their patrol efforts on manatee speed zones where the risk to manatees encountering noncompliant boaters has been high.

The Service also considered impacts from alteration of manatee habitat through dredge and fill activities associated with construction of new watercraft access projects and potential direct harm or harassment of manatees during construction activities. These types of anticipated direct impacts to habitat are addressed through facilities siting and 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 Construction Conditions* (FWC 2005), which are routinely included as conditions of Department of the Army permits issued for construction projects in manatee habitat.

ACTION AREA

The Corps has received applications for the addition boat slips within Reach 33. The Service believes that the action area for this biological opinion is the most-probable travel route of watercraft using the proposed docking facilities. It is anticipated these watercraft will be used primarily for day trips, mostly on weekends and holidays, and during daylight hours, traveling throughout Reach 33. The proposed projects are located within the Bokeelia area in Reach 33. Vessels using the new facilities would likely travel through Matlacha Pass, Pine Island Sound, Charlotte Harbor, or San Carlos Bay, to the Gulf of Mexico. These waters closely correspond to the area defined as Reach 33 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 33.

Status of the Species within the Action Area

Manatees migrate through Lee County. 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.

Manatee abundance in Lee County has been documented repeatedly through aerial surveys conducted from 1995 to 2004. Aerial Surveys of the Charlotte Harbor and Bokeelia areas Conducted in May of 2002, 2003, and 2004, indicated that manatees feed, rest and travel in the Bokeelia Area.

Survey year (April)	2002	2003	2004
Manatee abundance within the Bokeelia Area	4	3	17

Designated manatee critical habitat is present within the action area and important components of manatee critical habitat are also present. These components, although not identified as primary or secondary constituent elements of critical habitat, include seagrasses for foraging, shallow areas for resting and calving, channels for travel and migration, warmwater refugia for cold weather events, and fresh water for drinking. Results of aerial surveys and anecdotal evidence indicate that manatees exhibit seasonal movements within Reach 33. Manatees respond to cool ambient temperatures during the winter by aggregating within deeper water in canals such as the system of canals located in Matlacha Isles. Manatees may also move into Caloosahatchee River (outside the action area) and congregate near the Fort Myers Power Plant warmwater effluent and the 56-foot deep channel downstream of the Franklin Locks. However, during mild winters (>68 degrees Fahrenheit ambient temperature), manatees may remain in the action area. Throughout the warm season, manatees are widely dispersed within the action area and known to use the large beds of seagrasses located within Pine Island Sound, Matlacha Pass, and San Carlos Bay as foraging areas.

Factors Affecting the Species' Environment Within the Action Area

We know sublethal forms of take (such as injury and harassment) occur, but some of these forms are immeasurable. Sublethal injury to manatees due to boat interactions is a significant factor. On a continued basis, this type of injury could have an impact on maintaining a healthy and viable population. In that regard, most manatee carcasses examined bear scars from previous strikes with watercraft (Wright et al. 1995), and a significant number of living, but scarred, manatees exist. A photo-identification system and database of scarred manatees currently maintained by the Sirenia Project (Beck and Reid 1995) contain only individuals with distinct scars, the vast majority of which appear to have been inflicted by propeller blades or keels. This database now documents 1,184 living individuals scarred from collisions with boats. Most of these manatees (1,153, or 97 percent) have more than one scar pattern, indicating multiple strikes with boats. Carcasses examined at necropsy also bear healed scars of multiple past strikes by boats; one extreme case, recently noted by the FMRI, had evidence of more than 50 past boat collisions (O'Shea et al. 2001). The severity of these boat strikes, including completely severed tails, major tail mutilations, and multiple disfiguring dorsal lacerations, is thought by some manatee researchers to impact population processes by reducing calf production (and survival) in wounded females, although there are no reliable data to establish this cause and effect relationship. Overall, the full effects of harm to manatee population dynamics resulting from boat strikes remain largely unknown.

In addition to direct injury due to boat strikes, harassment by boats and swimmers may drive animals away from preferred sites thus altering manatee behavior and movement patterns. Significant and/or long-term harassment may require manatees to travel greater distances to feed

or to reach warmwater refugia. Furthermore, some researchers are concerned manatee calves can be separated from their mothers and some individuals may be driven from preferred warmwater refuges due to harassment.

Watercraft-related death and serious injury is the most important human-related factor affecting the manatees within the action area. Between 1974 and 2005, 970 manatee deaths were recorded within Lee County. The cause of death categories includes watercraft, flood gate/canal lock, other human causes, perinatal, cold stress, natural, and undetermined. Death category quantities are as follows: watercraft, 196; flood gate/canal lock, 3; other human causes, 14; perinatal, 159; cold stress, 46; natural, 261; and undetermined, 291.

Many boat owners in Lee County utilize public boat ramps to access the Calooshatchee River, San Carlos Bay, Pine Island Sound, and the Gulf of Mexico. The Corps does not regulate watercraft operations from either private docks or public boat ramps. However, other programs that do regulate watercraft operation from these facilities, such as the agencies that establish and enforce speed zones, have the greatest potential to contribute to take of manatees and the greatest potential to control such take.

The potential long-term effect of continued growth in Lee County's human population on the quality of coastal ecosystems is another factor affecting the manatee. As Lee County's 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.

Lee County developed an MPP to include boating speed regulations and facility siting criteria. This plan was approved by the State of Florida in 2004. Within the action area, the first manatee speed zones were established in the Caloosahatchee and Orange rivers around the Fort Myers Power Plant in 1979. Water to cool the power plant was drawn from the Caloosahatchee River and discharged into the Orange River. These initial zones were seasonal zones designed to protect the herd of manatees wintering near the power plant. Additional speed zones were established in the Caloosahatchee downstream from the power plant in November 1989. These zones were designated as slow speed year-round and unregulated beyond a ¼ mile from shore. Sign posting of these zones was completed in March 1991. The State passed a rule establishing manatee speed zones countywide in November 1999 (68C-22.005 Florida Administrative Code). Additional signs and buoys were installed by Lee County in 1999 and upgraded in the spring and summer of 2001. These changes were necessary to improve awareness and enforceability of the existing speed zones (Steve Boutelle, Lee County, personal communication) within the river. In response to the State's rule establishing manatee speed zones throughout the county, the City of Cape Coral designated all the canal waterways within its jurisdiction as idle speed zones (along with appropriate signage) in March 2000.

To enforce a speed zone, the zone must be correctly signed and the signs must be in compliance with State-approved design parameters. All zones within the Lee County, including the action area, were posted by the county by July 2001 with speed zone signs in compliance with State-approved design parameters (68D-23 Florida Administrative Code).

The waters adjacent to the project sites do not contain manatee-protective speed zones. The open water zone in the vicinity of the projects encompasses an area that the manatee would reasonably be expected to utilize.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed actions 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 Construction Conditions* (FWC 2005), 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 facility. Construction of new watercraft access projects may 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 projects, construction of watercraft access projects may encourage boats to travel through important manatee habitat features such as submerged aquatic vegetation and warmwater refugia; thereby potentially altering manatee habitat and manatee habitat use patterns.

These projects are in areas occupied by the manatee and within designated critical habitat. These projects are located in a waterway that adjoins the Caloosahatchee River in Lee County, and occurs within the southern portion of the geographic range of the Southwest subpopulation of the manatee. The timing of construction for these projects (when it will be constructed) as it relates to sensitive periods of the manatee's life cycle are unknown. Manatees may be found adjacent to the proposed construction footprint during the spring, summer, and fall. There is a high probability during the cooler months, manatees will be present at the Fort Myers Power Plant discharge canal, the area of Franklin Locks, and within the natural waterways and manmade canal systems adjoining the river during the colder months. These projects will be constructed in a single, disruptive event, followed by perpetual activities, such as maintenance of the dock structures and watercraft entering and leaving the docks. The entire construction sequence is expected to be completed in less than 3 months. Although users of watercraft associated with these projects must operate at posted speeds within the action area and must be cautioned about the possible presence of manatees, physical contact, or harassment is still possible.

Analyses for Effects of the Action

The Corps has determined the projects addressed in the biological opinion are within Reach 33, as defined by the Corps' Reach Characterization Analysis. Furthermore, the Corps has determined all projects within Reach 33 cause an increased risk to the manatee due to several reach characteristics including: (1) the very high dock and boating density; (2) the reach contains manatee aggregation areas; (3) the very high potential for watercraft traffic to cross manatee aggregation areas; (4) the shape of the waterway is attractive for high-speed boat use; and (5) manatee protective speed zones are not present in certain areas.

Beneficial Effects - There are no known beneficial effects to manatees from the proposed activities.

Direct Effects - Direct effects are those effects caused by implementation of the proposed actions at the time of construction. The direct effects of watercraft access facilities on manatees and essential features of manatee habitat (such as seagrasses), include those arising from the location, design, and construction of watercraft access facilities, and associated dredging and filling for the construction of those facilities. In examining such effects, including those on seagrasses and other important features of manatee habitat, the Service analyzes the extent to which such effects are addressed by local MPP, State review, and other protective conservation measures, such as standard precautions to protect manatees during construction. The *Standard Manatee Construction Conditions* (FWC 2005) have been used throughout the range of the manatee for more than a decade and have proven to reduce the direct effects to manatees and their habitat within the facility footprint. The direct effects this will have on the manatee within the action area include noise from barge operation and construction equipment; in-water movement of construction equipment and work watercraft; placing and securing dock support structures and mooring piles; and barge ingress and egress to the construction site.

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. 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, the Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate 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.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 888-404-FWCC. Collision and/or injury should also be reported to the Fish and Wildlife Service in Jacksonville (904-232-2580) for north Florida or Vero Beach (772-562-3909) for south Florida.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by FWC must be used. One sign measuring at least 3 feet by 4 feet which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

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

Indirect Effects - Despite the establishment of manatee speed zones and the appropriate signage associated with these zones as well as an increase in law enforcement personnel provided by the State, watercraft-related manatee mortalities increased in Lee County from 13 to 23 individuals for 2000 and 2001, respectively. From January 1, 2000, through December 31, 2005, 79 manatees died as a result of a watercraft collision in the county. Between 2000 and 2005, 23 watercraft-related manatee deaths were recorded within Reach 33 and 3 deaths were recorded in the Bokeelia area of concern. To date, manatee speed zones have not been designated within the Bokeelia area.

Watercraft in the action area are typically used for fishing, sight-seeing, and waterskiing by local and seasonal residents. Because of their shallow draft, most powerboats can operate in areas of shallow water including seagrasses, mangrove shorelines, and waters adjacent to spoil islands and bridges. Sailboats require deeper water to operate because of their deeper drafts. Consequently, sailboats in the area tend to travel within navigation channels ranging from 10 to 12 feet in depth. Data provided by the Florida Department of Highway Safety and Motor Vehicles, Bureau of Vessel Registrations indicate that boaters in Lee County registered 43,444 vessels in 2001; 45,145 in 2002; 47,036 in 2003; 48,896 in 2004 and 50,307 in 2005.

Species Response to the Proposed Actions

New watercraft resulting from the proposed projects will likely travel within the waters of Pine Island Sound and Charlotte Harbor and may enter the Gulf of Mexico, Matlacha Pass, and

San Carlos Bay. The most likely effects to manatees caused by increased watercraft traffic are deaths or injuries from collisions with watercraft and alteration of seagrass beds used as feeding or resting areas.

The project sites are not located within waters that contain designated manatee speed zones. Based on the absence of protection measures (*e.g.*, speed zones, signage, enforcement) for manatees, the Service believes that an increase in watercraft associated with the proposed actions are reasonably certain to result in the take of manatees in the form of additional deaths and injuries.

Although critical habitat is present in the action area, the Service believes that the addition of these single-family docks will not result in adverse modification of critical habitat because of the absence of and/or the minimization of risk to important components of manatee critical habitat, which are present in the action area. The Corps has agreed to include as a condition of the permit, if approved, the *Standard Manatee Construction Conditions* (FWC 2005).

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 that are unrelated to the proposed actions are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

In August 1999, the Service conducted a workshop to: (1) review what is known about the manatees' winter use of natural and industrial warmwater sites; (2) discuss the status and future of these sites; and (3) discuss information and management needs necessary to ensure the availability of warm water for wintering manatees (Service 2000). Well over half of the manatee population relies on industrial warmwater discharges for warmth during the winter. While these discharges are reliable sources of warmth, they are ephemeral in nature, restricted by the life span of generating facilities, operational limitations, fluctuating demand for power, and pending deregulation of the power generation industry. This, in combination with the fact that some industrial discharges have attracted manatees outside of their traditional wintering habitat, has put this species at risk.

One of the presentations at the workshop reported the results of a study on the manatees' response to the elimination of a warmwater refuge in north Florida. Of the 15 animals that were radio-tagged and tracked in this study, 6 manatees died and 2 were rescued between October 1997 and March 1998. A couple of the preliminary conclusions are that five of the six manatee deaths were due to prolonged exposure to colder temperatures and not all manatees migrate south to warmwater aggregation sites once their current source of warm water is eliminated. As discussed earlier in this biological opinion, manatees use the Fort Myers Power Plant discharge as a warmwater refuge during the winter months. If the power plant were to shutdown during the winter, thereby eliminating the warmwater discharge, then hundreds of

manatees would be at risk to chronic exposure to colder temperatures. As an alternate warmwater site in the action area, Matlacha Isles may become more important for manatees seeking warm water during the colder months.

CONCLUSION

After reviewing the current status of the manatee, the environmental baseline for the action area, the effects of the proposed actions and the cumulative effects, it is the Service's biological opinion that the actions, as proposed, are not likely to jeopardize the continued existence of the manatee and is not likely to adversely modify designated critical habitat.

However, based on watercraft-related mortality and the absence of the necessary measures to protect manatees (*e.g.*, speed zones, signage, and enforcement) in the Bokeelia area, the Service believes that the proposed actions are reasonably certain to result in the take of a manatee in the form of additional deaths and injuries.

INCIDENTAL TAKE STATEMENT

The Service anticipates the proposed actions are reasonably certain to result in the take of manatees. However, the Service is not including an incidental take authorization for marine mammals at this time because the incidental take of marine mammals 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

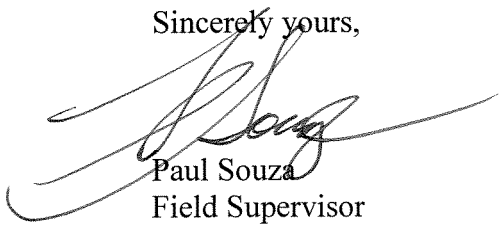
This concludes section 7 consultation on the proposed issuance of Corps' permit applications listed below:

Service Consultation Code	Corps Application Number	New Boat Slips	Date Received	Applicants
41420-2006-F-0438	SAJ-2006-3186 (GP-MJD)	1	6/20/2006	White Knight Construction
41420-2006-F-0867	SAJ-2005-10877 (GP-PW)	2	9/06/2006	Julian H.L. Stokes

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.

The above findings and recommendations constitute the report of the Department of the Interior. Thank you for your cooperation and effort in protecting fish and wildlife resources. If you have any questions regarding these projects, please contact Chuck Kelso at 772-562-3909, extension 241.

Sincerely yours,



Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc:
Regional Solicitor, DOI, Atlanta, Georgia (Delores Young)
Service, ARD-ES, Atlanta, Georgia (Noreen Walsh) (electronic copy only)
Service, Jacksonville, Florida (Species Lead)
NOAA-Fisheries, Miami, Florida
FWC (ISM), Tallahassee, Florida (Carol Knox)
FWC, Vero Beach, Florida
DEP, West Palm Beach, Florida
Corps, Fort Myers, Florida (Skip Bergmann)

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