

**Modify Existing Manatees Protection Measures
in Kings Bay, Citrus County, Florida**

**Environmental Assessment
With Finding of No Significant Impact**

Prepared by:

**U.S. Fish and Wildlife Service
North Florida Ecological Services Office**



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Executive Summary

The U.S. Fish and Fish and Wildlife Service (Service) proposes to modify the existing network of manatee protection areas within the waters of Kings Bay, located partially within the city limits of the City of Crystal River and wholly within Citrus County, Florida. Kings Bay is the primary wintering site for endangered Florida manatees in northwest Florida, a region that supports about 12 percent of the entire population of this subspecies. Manatees are attracted to Kings Bay's warm spring waters which they use as a thermal refuge during the winter months.

Visitors and local residents are also attracted to Kings Bay's waters. They come to see manatees and engage in other waterborne activities throughout the year. Recreationists view wintering manatees while snorkeling, skin diving, and SCUBA diving, and view them from boats, including kayaks, canoes, motorboats, and other conveyances. Other waterborne activities that take place on Kings Bay waters include boating, fishing, water skiing, swimming, as well as non-manatee related skin- and SCUBA - diving. Some manatees are harassed by the actions of recreationists viewing manatees. Manatees may also be harassed indirectly by the presence of large numbers of recreationists, whose sheer numbers may unintentionally displace manatees. Manatees are also injured and killed in Kings Bay as a consequence of other waterborne activities.

To minimize the take of manatees, the Service and the Florida Fish and Wildlife Conservation Commission (Commission or FWC) created a network of sanctuaries and speed restrictions in Kings Bay to provide manatees with undisturbed wintering sites and safe travel corridors in waters shared with the public. These measures are supplemented with law enforcement efforts, a special use permitting program on National Wildlife Refuge property for manatee tour operators and videographers, and extensive, local education and outreach efforts. All measures are consistent with Federal and State authorities used to minimize the take of manatees. The Service manages this network in Kings Bay through its Crystal River National Wildlife Refuge (Crystal River NWR). The Commission supports these management efforts through its Imperiled Species Management Section and law enforcement activities.

The number of reported cases of manatee harassment and manatees killed or injured due to human activities (takings) has increased concurrent with growing numbers of local residents and visitors, numbers of registered boats, increasing numbers of manatees, and the relatively recent presence of manatees throughout the year. To meet the purpose and need of the proposed action, the Service's Preferred Alternative is the designation of Kings Bay as a manatee refuge, under the authorities of the Endangered Species Act of 1973, as amended, the Marine Mammal Protection Act of 1972, as amended, and their implementing regulations.

A variety of alternatives were considered when developing this recommendation. Considered alternatives included: modifying the existing network of manatee sanctuaries and speed restrictions; revising Federal regulations to include better takings definitions; and enhancing existing education and outreach activities with enhanced materials and programs. After a thorough analysis of all of the alternatives developed along with consideration of the public input received during the public involvement process, the Service has determined that Alternative F, which establishes a manatee refuge in Kings Bay, satisfies the purpose and need of the proposed action and is practicable and feasible to accomplish our goal.

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Chapter 1: Proposed Action

1.1 Introduction

The U.S. Fish and Wildlife Service (Service) believes there is substantial evidence to support the increase of protection measures for the Florida manatee (*Trichechus manatus latirostris*) to the network of protection measures already in place in the waters of Kings Bay, Citrus County, Florida. These waters include that tract of submerged land that includes all waters of Kings Bay, including all tributaries and adjoining water bodies, upstream of the confluence of Kings Bay and Crystal River, described by a line that bears North 53°00'00" East (True) from the northeastern-most point of an island on the southwesterly shore of Crystal River (approximate latitude 28° 53'32" North, approximate longitude 82°36'23" West) to the southwestern-most point of a peninsula of Magnolia Shores (approximate latitude 28°53'38" North, approximate longitude 82°36'16" West). See Map1 "Kings Bay Manatee Refuge."

The Kings Bay springs constitute one of the most important natural warm-water shelters for manatees. Increasing numbers of in-water visitors to Kings Bay and an absence of adequate space at wintering areas in which an increasing number of manatees can shelter free from harassment and other forms of take prompted the Service to published an emergency rule establishing the Kings Bay Manatee Refuge in Citrus County, Florida on November 9, 2010 (75 FR 68719), in accordance with regulations at [50 CFR 17 Subpart J – Manatee Protection Areas](#) (Subpart J). The emergency rule was in effect for 120 days, expiring on March 15, 2011. In accordance with Subpart J (50 CFR 17.106), the Service initiated the rulemaking process within 10 days of publication of the emergency rule, including development of an Environmental Assessment (EA). On June 22, 2011, the Service put forward Alternative B of the draft EA as a proposed rule in the Federal Register (76 FR 36493) and opened a 60-day public comment period. The public was also notified of the availability of the draft EA in the proposed rule.

The Service has the discretion to establish manatee protection areas (in the form of a manatee refuge or a manatee sanctuary) whenever there is substantial evidence showing such establishment is necessary to prevent the taking of one or more manatees (50 CFR 17.103). A manatee refuge is defined as an area in which the Director has determined that: (1) certain waterborne activities would take one or more manatees; or (2) certain waterborne activities must be restricted to prevent the take of one or more manatees, including but not limited to taking by harassment (50 CFR 17.102). A manatee sanctuary is an area where it has been determined that any waterborne activity would result in the taking of one or more manatees, including but not limited to a taking by harassment (50 CFR 17.102).

The Service's proposed action to increase manatee protection in Kings Bay is intended to improve the Service's ability to manage an important manatee use area where significant levels of human activity occur and to minimize the "take" of manatees. "Take," as it relates to manatees, is defined under both the [Endangered Species Act of 1973](#), as amended (ESA) (16 U.S.C. 1531 *et seq.*) and the [Marine Mammal Protection Act of 1972](#), as amended (MMPA) (16

U.S.C 1361 *et seq.*). Take, as defined by section 3(19) of the ESA, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by regulation at 50 CFR 17.3 to mean an act which actually kills or injures wildlife. Harass is also defined by regulation to mean any intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. Take, as defined by section 3(13) of the MMPA, means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Take is further defined in 50 CFR 18.3 to include, without limitation, any of the following: The collection of dead animals or parts thereof; the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal; or the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in the disturbing or molesting of a marine mammal. Under section 3(18) of the MMPA, harassment is defined to include any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B). All takings, including takings by harassment, are prohibited.

The Service has prepared this EA to analyze potential effects to the human, physical, and biological environment that may result from the proposed action. This EA will be used by the Service to decide which alternative best meets the purpose and need of the proposed action in Kings Bay. This EA also aids the Service in determining whether further analyses are needed through preparation of an environmental impact statement. This EA has been prepared pursuant to the requirements of the National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. 4321 *et seq.*) as implemented by the Council on Environmental Quality regulations (40 CFR 1500 *et seq.*) and Department of the Interior NEPA procedures.

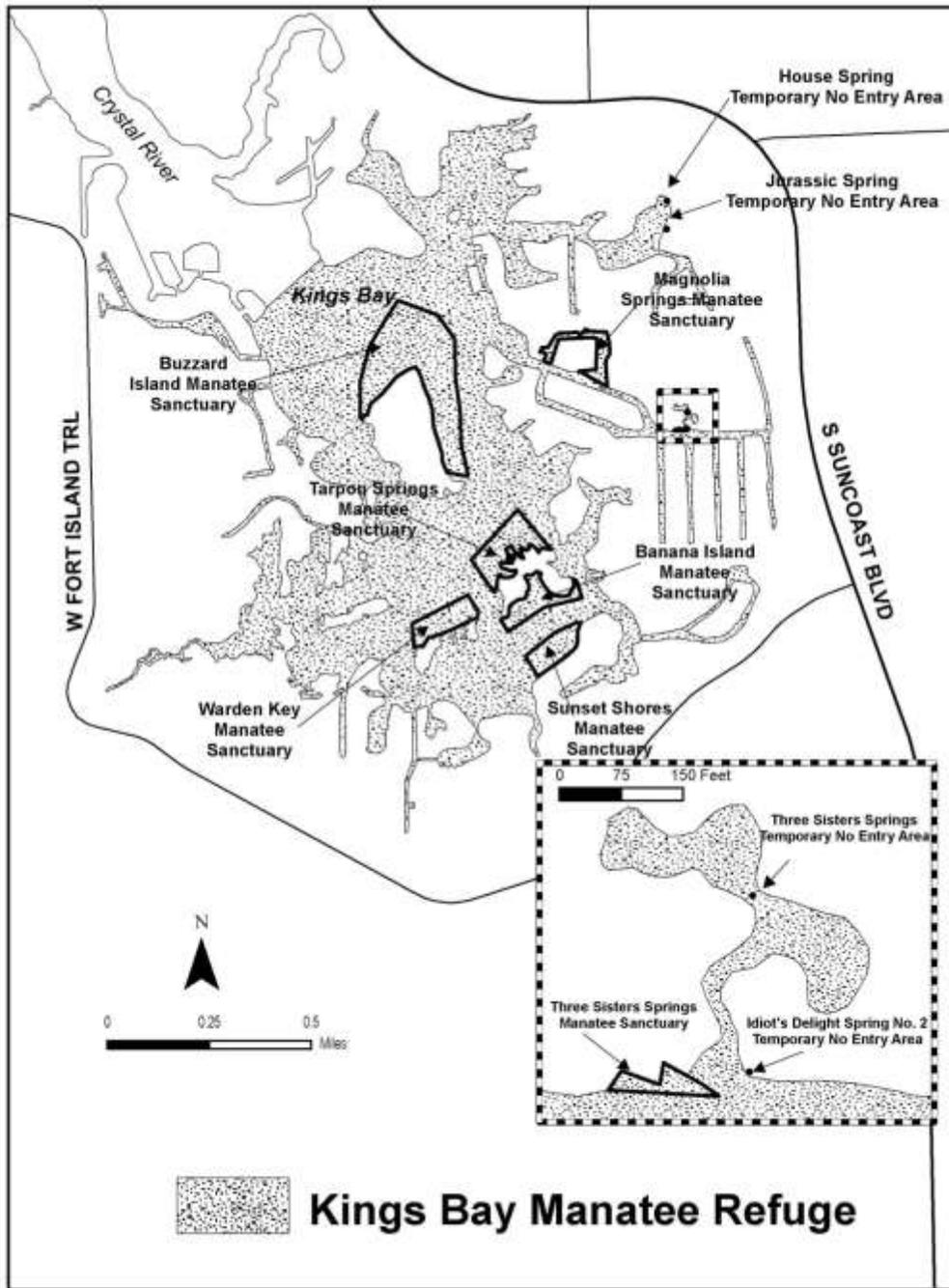
1.1.1 Status of the Florida Manatee

The West Indian manatee (*Trichechus manatus*) was listed as an endangered species on June 2, 1970 (35 FR 8491) under the Endangered Species Conservation Act of 1969 and this status was retained under the ESA. The population is further protected as a depleted stock under the MMPA. The West Indian manatee includes two subspecies: the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee (*Trichechus manatus manatus*). As the Antillean manatee does not occur in Florida, references in this document to “the manatee” or “manatees” are specific to the Florida manatee, unless otherwise noted.

Florida manatees can be found throughout the southeastern United States, with Florida at the core of its range. Extensive efforts are ongoing by the Service and the Florida Fish and Wildlife Conservation Commission (FWC or Commission) to recover this species. In particular, significant efforts are made to minimize human-related threats and to prevent the number of manatees taken by human activities.

On October 22, 1979, the Service adopted a regulatory process to provide a means for establishing manatee protection areas in waters under the jurisdiction of the United States where

manatees were taken by waterborne activities (44 FR 60964). The first manatee protection areas were designated in Kings Bay, Citrus County, Florida on November 12, 1980, for the purpose of preventing the take of manatees by harassment from waterborne activities and included the Banana Island Sanctuary (including King Spring), the Sunset Shores Sanctuary, and the Magnolia Springs Sanctuary (45 FR 74880). The Service subsequently designated four additional manatee protection areas in Kings Bay on May 12, 1994 and on October 16, 1998 (including the Buzzard Island, Warden Key, and Tarpon Springs Sanctuaries, and the Three Sisters Springs Sanctuary, respectively) (59 FR 24654, and 63 FR 55553).



Map 1. This map shows the area examined in this EA. This map was included in the proposed rule to establish a manatee refuge in Kings Bay (Alternative B). Areas outlined in bold indicate existing Federal seasonal manatee sanctuaries. Areas identified as “Temporary No-Entry Areas” are described in Alternatives B and E as areas that may be put into effect when weather or manatee use patterns indicate that such additional protection areas are necessary.

The best, current count of the statewide manatee population is approximately 5,076 animals based on a single statewide count at warm-water sites and adjacent areas in January 2010 (FWC FWRI unpub. synoptic aerial survey data, 2011). The most recently published information on Florida manatee population demographics (growth, survival, and reproductive rates) includes studies by Runge *et al.* (2004), Craig and Reynolds (2004), Kendall *et al.* (2004), and Langtimm *et al.* (2004). Updated adult survival rates for the Atlantic Coast and Northwest regions are reported in Runge *et al.* (2007). These analyses indicate that manatees are increasing or stable throughout most of Florida. While these authors do describe a declining growth rate in the Southwest Region, more recent data suggests that the growth rate in this management unit may be stable or even increasing (C.B. Langtimm, USGS Florida Integrated Science Center, pers. com., 2010).

The primary, direct, human-related threat to Florida manatees is watercraft-related strikes which kill and injure these animals (Rommel *et al.* 2007, Lightsey *et al.* 2006). Natural threats include exposure to cold temperatures and red tides. A significant habitat threat to the Florida manatee is the loss of warm water at natural, warm-water springs and at power plants (Laist and Reynolds 2005a, b). Natural springs are threatened by reductions in flow and water quality and by factors which affect manatee access and use of the springs (Florida Springs Task Force 2001).

A quantitative threats analysis that forecasted changes in the Florida manatee population under different threat scenarios was conducted by Runge *et al.* (2007). The threats analysis indicated that the most significant threats to Florida manatees are watercraft collisions and the potential loss of warm water habitat throughout the state. Consistent with the Service's recovery goals for the Florida manatee, threats to the species must be reduced or eliminated such that the species no longer fits the definitions of threatened or endangered. The Service and FWC continue to implement recovery actions consistent with our authorities and necessary to achieve these goals. While a significant number of animals are attracted to warm-water discharge from several power plants around the state, these are not a reliable long-term source. Over time, older power plants are being replaced with more efficient designs that do not discharge warm water to the extent the older plants do. Additionally, a power plant failure or shutdown during winter could result in a number of manatees being exposed to cold stress, which could result in death.

1.1.2 Status of Manatees in Kings Bay

The Florida manatee's range includes Kings Bay, a large embayment at the headwaters of the Crystal River, a tidal river, located on Florida's west coast. Springs are the primary water source for this estuarine system; a recent report describes 70 springs that discharge warm artesian water into Kings Bay (Vanasse, Hangen, and Brustlin, Inc., 2010). Kings Bay is located within the City of Crystal River in Citrus County, Florida. Citrus County and the City of Crystal River are an integral part of "Florida's Nature Coast", a northwest Florida region marketed for outdoor recreational opportunities, including opportunities for viewing manatees (Nature Coast Coalition 2010 website). In addition to viewing manatees, area recreationists engage in snorkeling and diving, boating, canoeing and kayaking, fishing, waterskiing, and other activities (Gold 2008). Local eco-tour operators, dive shops, marinas, hotels and motels, restaurants, and other businesses benefit from these activities (Buckingham 1990).

The Kings Bay springs constitute one of the most important natural warm-water shelters for manatees. Manatees have historically been attracted to the warm, spring-fed waters in Kings Bay where they retreat from the cold during the winter. The manatee population in northwest Florida grew at a rate of 4.0 percent per year through 2000, based on an assessment of adult survival rates (Runge *et al.* 2004). As manatee populations have increased, year-round use of Kings Bay by manatees has increased accordingly (Figures 1 and 2). Aerial counts were first conducted during the winter of 1983–1984, when 142 manatees were sighted in Citrus County; 124 of these animals were sighted in Kings Bay and Crystal River. In January 2010, Crystal River NWR researchers counted 646 manatees in Citrus County’s coastal waters, including 566 manatees in Kings Bay. This is the highest number of manatees ever counted in this region and in Kings Bay (J. Kleen, Crystal River NWR, 2010, pers. com.).

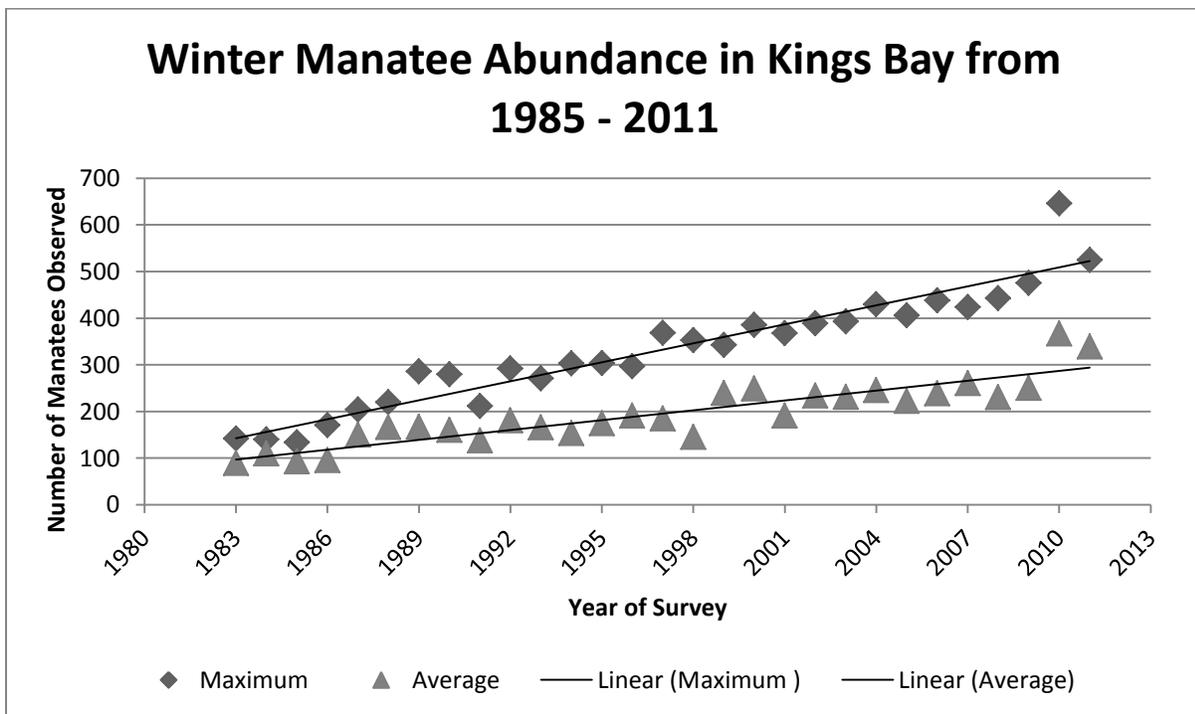


Figure 1. Maximum and average numbers of manatees detected with winter aerial manatee surveys from 1983 through 2011 within the Kings Bay area. The winter survey area is flown from October through March. (Kleen and Breland 2011, unpublished report)

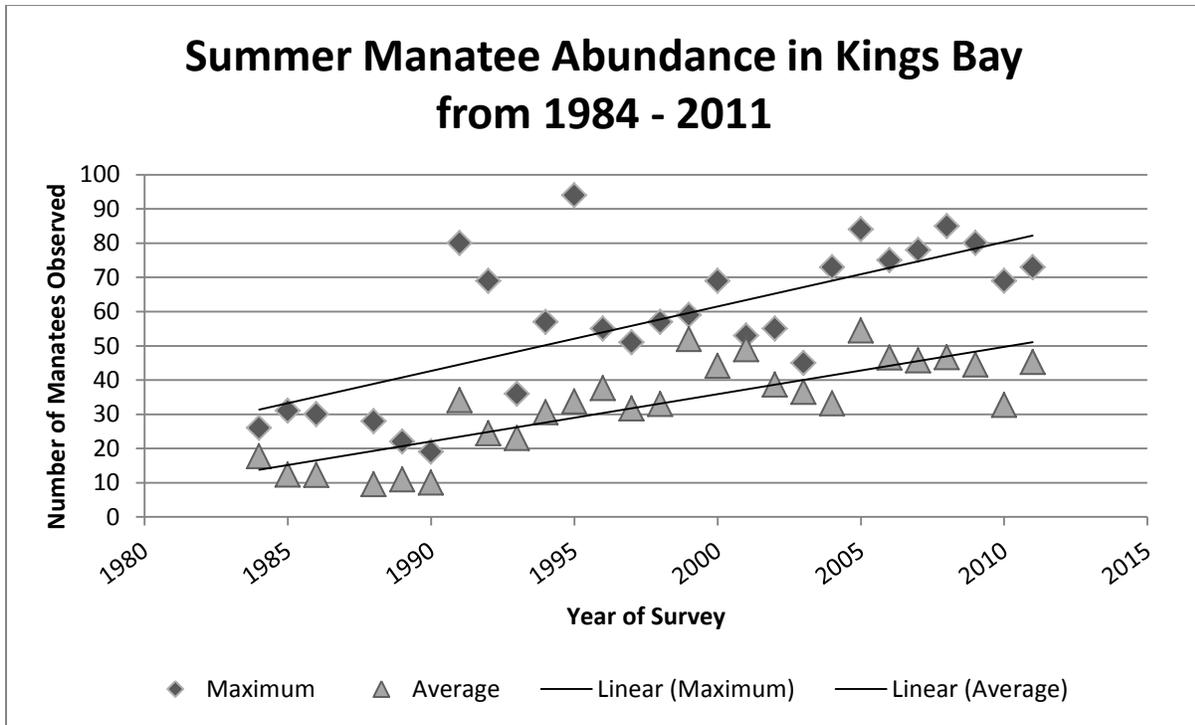


Figure 2. Maximum and average numbers of manatees detected with summer aerial manatee surveys from 1983 through 2011 within the Kings Bay area. The summer survey area is flown from April through September. (Kleen and Breland 2011, unpublished report)

The number of Citrus County residents increased by 19.8 percent (an average annual growth rate of 2.5 percent per year), from 118,085 to 141,416, between 2000 and 2008 (U.S. Census Bureau 2010 website). Concurrent with this increase in number of residents, the number of boats registered in Citrus County increased by 36.2 percent at an average annual growth rate of 4.0 percent per year. In 2010, there were 16,901 boats registered in Citrus County, 3,975 more than the 12,926 vessels registered there in 2000 (FDHSMV 2011 website). While the number of visitor-owned watercraft that are used in Citrus County waterways including Kings Bay is unknown, this number is likely increasing based on county revenue trends that describe an increasing number of visitors to the area. Revenue trends associated with businesses that cater to visitors, including Citrus County lodging and food service revenues and tourist tax revenues, have increased by 178 percent and 214 percent, respectively, over the past 10 years, suggesting an increase in the number of visitors to the area (U.S. Census Bureau 2010 website). Tourism surveys suggest that about half of all visitors to the area come to Citrus County to enjoy water-based activities that include manatee viewing, snorkeling, and diving (Gold 2008).

Over the last 30 years (1980–2010), the Service and the State of Florida have created a network of manatee protection areas within the Kings Bay area. This network was designed to prevent the take of manatees by waterborne activities, including but not limited to, watercraft and manatee viewing activities, and was established to allow manatees to continue to gain access to critical warm-water areas and important resting and foraging areas. The network includes seven seasonal Federal manatee sanctuaries (which are described in our regulations at 50 CFR

17.108(a)(1)–(a)(7)) and five State manatee protection zones (as described in Chapter 68C-22, “The Florida Manatee Sanctuary Act” (2010)).

The seven Federal sanctuaries are located at heavily-used winter, warm-water sites (springs) and foraging areas and preclude all waterborne activities within their boundaries, preventing take from both watercraft and manatee viewing within these areas. The State protection zones include year-round idle and slow speed zones that prevent the take of manatees from high speed watercraft collisions. This network of manatee protection areas is enforced by Service, State, and local law enforcement officers. Extensive outreach and education programs support the protection area network, encouraging the public who engage in waterborne activities, including boating, manatee viewing activities, and others, to avoid taking manatees.

Given the State’s statutory responsibilities for balancing the needs of manatees with the needs of the boating community, the State designated a 35 miles per hour (MPH) (daytime) / 25 MPH (nighttime) watersports area (watersports area) in Kings Bay between May 1 and August 31. This area was designated in 1992 and encircles Buzzard Island in the center of the Bay.

Manatee Viewing - Harassment Issues and Existing Protection Measures

Manatee viewing activities provide a significant source of revenue to the local economy (Buckingham 1990). Local eco-tour businesses bring visitors out to Kings Bay where visitors view manatees while in the water, from boats, and from other vantage points. Some manatees initiate encounters with visitors, but most manatees avoid or ignore encounters with people, preferring to frequent manatee sanctuaries where all human activities are prohibited. Some manatees are harassed by visitors, despite the fact that all forms of harassment are prohibited by law.

Hartman (1979) was the first to observe and describe how manatees respond to the presence of people in the water, observing that most manatees tended to avoid people, some ignored people, a few approached people and then left, and some approached and initiated interactions with people. These observations were made in Kings Bay’s warm water springs and the author correlated a reduction in the number of manatees using the Main Spring with an increasing number of people (Hartman 1979). Concern has been expressed about manatees displaced from warm water springs for prolonged periods of time; prolonged exposure to cold can be fatal to manatees, especially for smaller animals (O’Shea 1995). Hartman (1979) believed that manatees in Kings Bay are harassed by people in the water and by boats.

Researchers have observed and documented manatee responses to people and boats (Sorice *et al.* 2003). Researchers noted increases in swimming, milling, and cavorting behaviors and decreases in resting, feeding, and nursing behaviors in the presence of increasing numbers of people and boats (Abernathy 1995; Wooding 1997; King and Heinen 2004). They also observed that increases in numbers of boats and people prompted manatees to use other areas (Kochman *et al.* 1985; Buckingham *et al.* 1999). However, none of these studies’ observations of manatee responses to viewing participants and boats suggest that harm (killing or injuring of manatees) has occurred or is occurring (Sorice *et al.* 2003). Nor have there been any significant increases in the number of cold-related injuries and mortalities in the northwest Florida region, even in the

recent extreme cold events which killed large numbers of manatees in other portions of the winter range. For example, in the 2009-2010 winter cold event, only two deaths due to cold stress were recorded in Citrus County while to the south in Lee County, 24 manatee deaths were reported due to cold stress (FWC FWRI Manatee Mortality Database 2011 website). Manatee survival rates in the northwest region are among the highest in Florida (Runge *et al.* 2007).

Observations of manatee harassment (as defined by both the ESA and MMPA) in Kings Bay prompted the Service to promulgate a rule in 1979 that allowed the agency to designate manatee protection areas where certain waterborne activities, including boating and swimming, could be restricted or prohibited in order to “reduce the incidence of manatee injuries and deaths” and to “lessen the likelihood that manatees will encounter boats and people” (44 FR 60964). Subsequently, three manatee sanctuaries were designated in Kings Bay in 1980: Banana Island Sanctuary, the Sunset Shores Sanctuary, and the Magnolia Springs Sanctuary (45 FR 74880).

In 1983, the Service purchased lands in and around Kings Bay and established the Crystal River National Wildlife Refuge (NWR) for the purpose of protecting manatees and to educate the public about manatees. Waterborne activities that occur on the Crystal River NWR property in Kings Bay that are known to take manatees are prohibited. Activities are regulated under the National Wildlife Refuge Improvement Act (16 U.S.C. 668dd-668ee), which allows the Service to issue special-use permits (SUPs) for commercial and retail activities that occur on NWR property. National Wildlife Refuges are Service-owned or managed lands that are managed to broadly conserve, manage, and restore fish, wildlife, and plant resources and their habitats. The Banana Island Manatee Sanctuary, designated under 50 CFR 17 Subpart J, prohibits all waterborne activities from occurring on some submerged lands owned by this NWR. Commercial and retail activities that occur on NWR land include manatee viewing, diving, snorkeling, videography, and others. Businesses wanting to engage in these activities on NWR property must obtain SUPs from Crystal River NWR. These permits are conditioned to require permittees to take those steps needed to make sure that their activities and those of their customers do not harass or otherwise take manatees.

In 1994, citing a doubling of the number of manatees in the area since 1980, a large increase in the number of visitors, the inability of the existing sanctuaries to provide sufficient shelter for manatees, and reports of increasing manatee harassment, the Service designated three additional sanctuaries in Kings Bay to prevent the take of manatees by harassment: Buzzard Island Sanctuary, Warden Key Sanctuary, and Tarpon Springs Sanctuary (59 FR 24654). This expansion was followed in 1998 by the addition of another sanctuary, Three Sisters Sanctuary, similarly justified by reports of increasing harassment and observations of increasing numbers of manatees, increasing numbers of recreational divers and snorkelers, and insufficient space for manatees to rest, free from harassment (63 FR 55553) (Table 1).

Table 1. Information justifying previous manatee sanctuary designations in Kings Bay, Florida.

| Date of Kings Bay manatee sanctuary designations | Approximate number of manatees using Kings Bay | Estimated number of people viewing manatees | Number of sanctuary designations NEW (TOTAL) |
|---|---|--|---|
| November 12, 1980 (45 FR 74880) | 100 | 30,000 to 40,000 | 3(3) |
| May 12, 1994 (59 FR 24654) | 240 | 60,000 to 80,000 | 3(6) |
| October 16, 1998 (63 FR 55553) | 250 | 100,000 | 1(7) |

Manatee harassment, largely associated with wintertime manatee viewing activities, has been an ongoing issue in Kings Bay, and a variety of methods are being used to help prevent and minimize harassment from occurring. The Service, State, non-government organizations, and private companies prepare and distribute outreach materials to manatee-viewing recreationists to familiarize them with best practices to follow when in the water with manatees. Best practices include the “Manatee Viewing Guidelines,” developed by the Service and partners. Outreach materials include, among other things, handouts, kiosks, signs, and videos. The Crystal River NWR developed “Manatee Manners,” a video that dive shops and kayak outfitters are required to show their customers before they enter Kings Bay. These businesses take visitors to see manatees in Kings Bay, including Crystal River NWR. As commercial interests conducting business within the NWR, they are required to obtain SUPs, which are conditioned to ensure that the permittees and their designees do not take manatees. Crystal River NWR also maintains a visitor center where guests are provided with outreach materials. The Crystal River Refuge’s “Manatee Watch” volunteer network places volunteers in kayaks near the sanctuaries to educate visitors and report infractions when they occur.

Federal regulations include 50 CFR 17.100 - 108, which provide for enforcement of manatee protection measures, and State regulations include provisions of the State’s Florida Manatee Sanctuary Act as codified in 68 C – 22 of the Florida Administrative Code. State and Federal officers have been cross-deputized and can enforce both State and Federal regulations. The Service, State, and other law enforcement agencies actively enforce harassment regulations in Citrus County and in Kings Bay. Cited acts of harassment include trespass by manatee-viewing individuals into manatee sanctuaries where the Service has determined that any waterborne activity occurring within these areas would result in take of manatees, including but not limited to take by harassment. Indirectly, the presence of large numbers of people in the vicinity of manatees may cause some animals to abandon the area, another form of harassment. Outside of these areas, the public disturbs and occasionally harasses manatees while engaged in viewing and other waterborne activities. When observed, violators are warned or cited. State violations include boaters traveling at speeds in excess of those described by law within specific areas. Given variations in enforcement practices and recordkeeping systems, these records are not used to describe trends in harassment activity.

Aerial observations of manatees in Kings Bay during especially cold periods include sightings of manatees within the sanctuary areas and in smaller springs. In recent years, dozens of manatees are seen sheltering just outside of the sanctuary boundaries because the sanctuaries are overcrowded. Some animals shelter in some of Kings Bay's smaller, unprotected springs, including House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring. As many as 20 animals have been seen in each of these sites on particularly cold days (J. Kleen, Crystal River NWR, 2010, pers. com.). Similar to previous circumstances that warranted increases in the level of protection for manatees in Kings Bay, the number of manatees using Kings Bay more than doubled since 1998 (from 250 animals to 516 animals in December 2011, with the highest count on record of 566 in January 2010; J. Kleen, Crystal River NWR, 2011, pers. com.); the number of residents, visitors, and boats increased; and the amount of space in the existing sanctuaries became insufficient to provide this number of manatees with shelter free from harassment. Manatees have been harassed in areas that are outside the boundaries of the existing sanctuaries (A. Aloise, USFWS-Law Enforcement, 2010, pers. com.), and acts of harassment are likely to increase in the absence of additional measures.

Watercraft-related Take

Watercraft associated with recreational and commercial activities are known to strike and kill or injure manatees, though the frequencies of such strikes vary depending on factors such as number of manatees, number of watercraft, and extent of protection measures. In the State's northwest region, where Kings Bay is located, adult manatee mortality is almost equally split between human-related and natural causes, with watercraft collisions being the leading source of human-caused mortality. From 1974 through 2010, collisions with watercraft killed 60 manatees in Citrus County waterways, including 13 manatees recovered in within the boundaries of the proposed action (FWC FWRI Manatee Mortality Database 2011 website). All 13 occurred since 1999. In 2008, FWC recorded the highest number (eight) of manatees ever killed by watercraft in Citrus County and three of these carcasses were recovered in Kings Bay (FWC FWRI Manatee Mortality Database website; Table 2).

Table 2. All carcasses recovered in the “Kings Bay” region from April 1974 through November 2010 for which the cause of death was determined to be watercraft. *The entry for 06/11/2002 is a carcass that was recovered outside of the boundaries of the Kings Bay Manatee Refuge, but considered the “Kings Bay” region by FWC. (Data source: FWC FWRI Manatee Mortality Database 2011 website)

| FL County | Date | Field ID | Sex | Size (cm) | Region | Probable Cause of Death |
|-----------|------------|-----------|-----|-----------|------------|-------------------------|
| Citrus | 10/27/1999 | MNW9934 | F | 268 | Kings Bay | Watercraft |
| Citrus | 10/12/2000 | MNW0029 | F | 275 | Kings Bay | Watercraft |
| Citrus | 06/11/2002 | MNW0222 | M | 207 | Kings Bay* | Watercraft |
| Citrus | 07/17/2002 | MNW0229 | F | 310 | Kings Bay | Watercraft |
| Citrus | 02/01/2003 | MNW0305 | F | 257 | Kings Bay | Watercraft |
| Citrus | 06/01/2004 | MNW0417 | F | 204 | Kings Bay | Watercraft |
| Citrus | 05/19/2006 | LPZ102120 | F | 259 | Kings Bay | Watercraft |
| Citrus | 05/24/2007 | MNW0715 | F | 227 | Kings Bay | Watercraft |
| Citrus | 07/04/2007 | MNW0721 | F | 331 | Kings Bay | Watercraft |
| Citrus | 08/23/2007 | LPZ102383 | M | 262 | Kings Bay | Watercraft |
| Citrus | 03/25/2008 | MNW0813 | F | 219 | Kings Bay | Watercraft |
| Citrus | 07/13/2008 | MNW0814 | M | 228 | Kings Bay | Watercraft |
| Citrus | 12/05/2008 | LPZ102654 | F | 261 | Kings Bay | Watercraft |
| Citrus | 01/03/2010 | MNW1002 | M | 246 | Kings Bay | Watercraft |

While watercraft-related deaths occur throughout the year in Citrus County, seven of the 13 watercraft-related deaths that were recovered in Kings Bay since 1999 took place during those times of the year when the watersports area was in effect (May 1 through August 31). In May 2004, observers witnessed a boat striking a manatee in the watersports area; a carcass was recovered nearby the following day (FWC FWRI Manatee Mortality Database 2011 website). Researchers are currently working on determining manatee scar acquisition rates for the Crystal River/Kings Bay manatee population, but preliminary findings suggest that propeller wounds continued to be acquired during their residency in the area (R. Bonde, peer review 2011).

Entanglement

Every year, manatees are entangled in fishing line, float lines, anchor and mooring lines, and other types of gear. In extreme cases, entangled manatees can die when entangling gear cuts into their hide, causing sepsis and the occasional loss of limbs. In cases when animals are superficially entangled, entangling gear is removed and the animals are released on-site. In more severe cases, manatees are transported to rehabilitation facilities where they are treated for injuries and infections associated with entanglements. There are 30 known cases of manatee entanglements from Citrus County, including 10 from Kings Bay. Fourteen of these cases include manatees entangled in crab pot float lines, including four from Kings Bay. The remaining cases from Kings Bay include four from fishing lines and two from anchor lines. County-wide records of entanglements include 24 rescues and four deaths. More than half of these are known to have occurred during the past 15 years (U.S. Fish and Wildlife Service Manatee Rescue Rehabilitation and Release Program entanglements unpubl. data). However,

measures, such as fishing line recycling programs and the State of Florida's derelict crab pot removal program, are already in existence within Kings Bay to provide means for reducing the number of lines discarded in this area.

1.2 Purpose and Need

Consistent with the goals of the Service's Florida Manatee Recovery Plan (USFWS 2001) and its status review of the West Indian manatee (2007), the purpose and need of the proposed action is to (1) further minimize the take of manatees by otherwise lawful activities in Kings Bay and (2) minimize human disturbance in a sensitive manatee wintering (sheltering) area.

Numbers of manatees, manatee use patterns (including information on areas used by manatees in the bay, seasonality, degree of use, etc.) and other biological information exists to show extensive manatee use of the area. Information derived from carcasses and other sources demonstrates that manatees are being taken by waterway users in and on the water. Waterborne activities occurring in Kings Bay that are known to take manatees include the actions of recreationists who harass manatees while viewing, watercraft operation that results in strikes that injure or kill manatees, and unattended anchor and float lines that entangle manatees causing injury and in some cases, death. While the number of takings has been minimized by the measures currently in place, take is increasing due to the increasing number of waterway users and manatees in this area.

1.3 Alternatives

1.3.1 Alternatives Formulation

Development of alternatives for the proposed action in Kings Bay entailed consideration of three key variables: 1) the current network of manatee protection areas in Kings Bay, pursuant to 50 CFR Subpart J – Manatee Protection Areas, and State authorities; 2) Federal regulations prohibiting the take of manatees, as described in for 50 CFR 17.3 and 50 CFR 18.3; and 3) law enforcement activities.

Current Network of Manatee Protection Areas in Kings Bay

To minimize or prevent the take of manatees, the Service and the State of Florida have designated a network of manatee protection areas at sites throughout Florida where threats to manatees have been well documented and where manatees are known to frequently occur. This network supports our goal of providing areas of protected habitat throughout peninsular Florida, adequate to satisfy the biological needs of the species.

Kings Bay currently includes seven Federal seasonal manatee sanctuaries and five State manatee speed restricted areas. Recreational activities, such as manatee viewing and watercraft operation, continue to take (*e.g.*, harass, injure, or kill) manatees in this area despite the existing network of protection measures. Previous efforts to address increasing numbers of takings from these activities have included adding protected areas, expanding existing manatee protection area boundaries, making protection area measures more restrictive, and other management practices.

While these efforts have been effective, changing recreationist activities and manatee use patterns contribute to increases in the number of takings and, thereby, create a need to implement additional measures.

Under a manatee refuge designation, restrictions to waterborne activities could be implemented that would improve the Service's ability to address takings associated with watercraft and manatee viewing activities.

Federal Regulations Prohibiting the Take of Manatees

It has been suggested that current Service regulations prohibiting the take, and more specifically harassment, of manatees could be modified to improve public understanding and enforceability of the law. The Service defines takings, including harassment, in its implementing regulations for both the ESA and the MMPA (50 CFR 17.3 and 50 CFR 18.3). These regulations prohibit the take of listed species, including manatees. Federal and State law enforcement officers enforce the current ESA and MMPA regulations, citing and prosecuting violators who engage in activities known to take manatees, including violators who harass manatees while engaged in viewing activities.

Pursuant to the Service's implementing regulations under the ESA (50 CFR 17.3), harassment includes any intentional or negligent acts or omissions that create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns. Normal behaviors include but are not limited to, breeding, feeding, or sheltering. In addition to the statutory definitions per Section 3 of the MMPA for "take" (3(13)) and "harassment" (3(18)), take is further defined in regulations at 50 CFR 18.3 to include, without limitation, any of the following: The collection of dead animals or parts thereof; the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal; or the negligent or intentional operation of an aircraft or vessel, or the doing of any other negligent or intentional act which results in the disturbing or molesting of a marine mammal.

The regulations could be modified to incorporate "no touch" and "approach distance" restrictions. Under a "no touch" restriction, touching manatees would be considered a form of harassment and would be prohibited by law. Similarly, an "approach distance" restriction would prohibit anyone from approaching a manatee within a fixed distance. Anyone approaching a manatee from some specified distance would be cited for harassment.

The modified restrictions would be difficult to enforce in light of the fact that manatees knowingly approach and, on occasion, initiate physical contact with people. Distinguishing between a manatee-initiated approach and contact and a person-initiated approach and contact could be difficult, especially when there are large numbers of manatees and people present. A fixed "approach distance" would be additionally difficult to enforce, given inherent difficulties associated with gauging distances in and on the water.

Law Enforcement Activities

Additional management practices used to minimize the take of manatees in Kings Bay include enforcement of protection area measures, education and outreach efforts, and monitoring manatee and recreationist activities.

Current enforcement activities include the use of Service special agents, Service NWR law enforcement officers, U.S. Coast Guard (USCG) law enforcement officers, FWC law enforcement officers, and others. A fixed number of Service NWR law enforcement officers are present on-site at Crystal River NWR and FWC maintains a local enforcement presence at its district headquarters, located in northern Citrus County. USCG officers are also locally present, deploying from USCG Station Yankeetown. Additional officers are brought into the Kings Bay area from outside the area to support local enforcement activities.

Enforcement efforts can include local, on-the-water officers, who police Kings Bay waters singly or in greater numbers from boats and other platforms. When needed, the number of patrolling officers is supplemented with officers from other locations. Occasionally, manatee enforcement details occur, when many officers police Kings Bay for some specified period of time. Uniformed and undercover officers enforce measures from boats and through a variety of other techniques. Patrol efforts are enhanced through the use of remotely deployed monitoring cameras.

Measures currently in place to minimize the number of manatees taken by recreationists and other waterway users could be maintained and supplemented with more Service enforcement officers at Crystal River NWR and additional resources. While additional officers and equipment would improve and enhance existing efforts, these additions would not address the need for changes to the protection areas, changes to existing permitting programs, improved education and outreach efforts, and monitoring activities.

1.3.2 Alternatives Considered

The alternatives identified in this final EA maintain the same identifying letters and sequence as presented in the draft EA (i.e., Alternatives A-E). As a result of public and peer review, an additional alternative has been developed through modification and clarification of Alternative B.

1.3.2.1 Alternative A - No Action

The No Action alternative maintains existing management measures within Kings Bay, but does not provide any additional measures. Existing measures in Kings Bay include:

- a network of Federal and State manatee protection areas in Kings Bay;
- 50 CFR 17.3 and 18.3 takings and harassment regulations; and
- Federal and State law enforcement efforts.

1.3.2.2 Alternative B - Designate a Kings Bay Manatee Refuge

This alternative was put forward as a proposed rule on June 22, 2011 (76 FR 36493). The proposed manatee refuge designation would modify the existing network of Federal and State manatee protection areas in Kings Bay and improve our ability to enforce takings and harassment regulations. The proposed rule was to designate the waters of Kings Bay (including all tributaries and adjoining water bodies upstream of the confluence of Kings Bay and Crystal River) as a manatee refuge. This alternative maintains the seven existing Federal manatee sanctuaries (Banana Island, Buzzard Island, Magnolia Springs, Sunset Shores, Tarpon Springs, Three Sisters, and Warden Key sanctuaries), but allows for temporary expansion of the boundaries of sanctuaries in space and time as described below. Waterborne activities would be restricted as follows:

- Watercraft speeds in Kings Bay would be restricted to slow speed throughout the year except in those areas where more restrictive measures are in place (e.g., idle or no-entry areas such as the existing sanctuaries);
- The Service would have the ability to designate temporary no-entry areas in Kings Bay between November 15 and March 31 in Kings Bay to specified distances outside the existing sanctuaries and at House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring, as follows:
 - For all existing Federal manatee sanctuaries, with the exception of Three Sisters Sanctuary, to a distance not to exceed 100 feet from the existing sanctuary boundary.
 - For the Three Sisters Sanctuary, to a distance not to exceed 400 feet from the existing boundary. We do not intend to completely mark off the manmade channel. Expansion could occur directly around the existing sanctuary and north into the area locally known as Three Sisters Springs.
 - For House Spring and Jurassic Spring, an area that does not exceed 100 feet from the associated spring vent.
 - For Idiot's Delight Number 2 Spring, an area that does not exceed 25 feet from the associated spring vent. Any temporary designation will be configured to avoid the manmade channel in the canal and will not block access into Three Sisters Springs.
- The Service would have the ability to designate temporary no-entry areas between April 1 and November 14 for no more than 14 days just before or after the manatee season (November 15 through March 31) in Kings Bay to specified distances (described in the previous bullet) outside the existing sanctuaries and at House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring;

- 13 specifically prohibited activities throughout the manatee refuge at all times:
 - Chasing or pursuing a manatee(s).
 - Disturbing or touching a resting or feeding manatee(s).
 - Diving from the surface onto resting or feeding manatee(s).
 - Cornering or surrounding or attempting to corner or surround a manatee(s).
 - Riding, holding, grabbing, or pinching or attempting to ride, hold, grab, or pinch a manatee(s).
 - Poking, prodding, or stabbing or attempting to poke, prod, or stab a manatee(s) with anything, including your hands and feet.
 - Standing on or attempting to stand on a manatee(s).
 - Separating a mother and calf or attempting to separate a mother and calf.
 - Separating a manatee(s) from a group or attempting to separate a manatee(s) from a group.
 - Giving a manatee(s) anything to eat or drink or attempting to give a manatee(s) anything to eat or drink.
 - Actively initiating contact with a belted and/or tagged manatee(s) and associated gear, including any belts, harnesses, tracking devices, or antennae.
 - Interfering with rescue and research activities.
 - Using mooring and float lines that can entangle manatees.
- Within Three Sisters Springs, the following waterborne activities would be prohibited between November 15 and March 31:
 - Entering Three Sisters Springs between 6 p.m. and 7 a.m.
 - Scuba diving.
 - Fishing, including but not limited to fishing by hook and line, by cast net, or by spear.
- Adjoining property owners, their guests, employees, and their designees may engage in watercraft access and property maintenance activities through manatee sanctuaries and designated no- entry areas. Use of sanctuary and no- entry area waters is restricted to authorized individuals accessing adjoining properties, storing watercraft, and maintaining property and waterways.
 - Authorized individuals must obtain a sticker or letter of authorization from the Service identifying them as individuals authorized to enter no-entry areas that adjoin their property.
 - Authorized individuals must conduct any authorized boating activity within these areas at idle or no-wake speeds.

1.3.2.3 Alternative C - Modify Sanctuaries

This alternative would modify existing sanctuary designations and maintain all other management measures currently in place. Modifications would include:

- expanding existing sanctuary (no-entry area) boundaries for sanctuaries that have become too small to admit growing numbers of manatees;

- eliminating sanctuaries no longer used by manatees;
- adding sanctuaries in areas newly used by manatees; and
- extending/reducing period of time that sanctuaries remain in effect.

1.3.2.4 Alternative D - Promulgate Harassment Regulations

This alternative would promulgate “no touch” and “stand-off distance” regulations to better control manatee harassment violations and maintain all other management measures currently in place.

1.3.2.5 Alternative E - Increase/Enhance Law Enforcement

This alternative would increase/enhance existing enforcement efforts and maintain all other management measures currently in place. Increased enforcement efforts include increasing the number of Federal law enforcement officers in Kings Bay, increasing the number of law enforcement details that occur in Kings Bay, increasing the amount of overtime hours available for added enforcement, etc. Enhancement activities could include expanded remote monitoring capabilities, improved and additional equipment, etc.

1.3.2.6 Alternative F – Modified Alternative B - Designate a Kings Bay Manatee Refuge (Preferred)

This alternative is the result of public and peer review comments. This alternative includes modifications and clarifications of the measures described in Alternative B, which was put forward as a proposed rule. Alternative B was to designate the waters of Kings Bay (including all tributaries and adjoining water bodies upstream of the confluence of Kings Bay and Crystal River) as a manatee refuge. As with Alternative B, Alternative F maintains the seven existing Federal manatee sanctuaries (Banana Island, Buzzard Island, Magnolia Springs, Sunset Shores, Tarpon Springs, Three Sisters, and Warden Key sanctuaries), but allows for temporary expansion of the boundaries of sanctuaries in space and time as described below. Additionally, this alternative does not supersede any more restrictive Federal, State, or local regulations currently in place nor does it preclude more restrictive future actions by these entities. Four modifications/clarifications were made from the restrictions described in Alternative B:

- 1) The proposed prohibition on use of mooring and float lines was removed. While manatees are entangled in fishing line, float lines, anchor and mooring lines every year and our proposed rule outlined the history of cases known from Citrus County, we do not know where that line was picked up and have no evidence that Kings Bay poses more of a hazard than other locations. Other measures, such as fishing line recycling programs and the State of Florida’s derelict crab pot removal program, are already in existence within Kings Bay to provide means for reducing the number of lines discarded in this area. Therefore, we have modified the rule to remove this proposed prohibition.

- 2) The Three Sisters Spring-specific prohibition is changed from “no-entry” to prohibiting all waterborne activities during nighttime hours. Additionally, the timeframe is revised from specific hours to “sunset to sunrise.” The reference to “waterborne activities” is necessary to ensure that we are within our authorities under Subpart J. This minor revision in hours is necessary to accomplish the intent to restrict activities during darkness when manatees cannot be seen and avoided and human activities cannot be monitored by enforcement officials.
- 3) The U.S. Coast Guard validated public comments suggesting that the year-round slow speed requirement of Alternative B would increase congestion in nearby Crystal River to the extent that it would cause a human safety hazard. Similar concerns were voiced by the Florida Fish and Wildlife Conservation Commission. As a result, the Service requested the USCG’s review of modifications to the final rule that intended to minimize the risk to manatees from collisions with watercraft to the maximum extent possible, without compromising human safety. The first bullet, below, describes the modification to the year-round slow speed requirement of Alternative B.
- 4) Alternative B did not contain the provision for high speed watercraft operation in the manatee refuge. To minimize the potential of attracting manatees into harm’s way in the high speed area, this Alternative prohibits anchorage (other than emergency anchorage) of watercraft in the high speed area from June 1 through August 15. Some manatees in the Kings Bay area are known to approach anchored boats for a variety of reasons, such as seeking cover around the boats, being attracted to the discharge of bilge water, chewing on anchor lines, etc.

Under this alternative, waterborne activities would be restricted as follows:

- All watercraft will be required to operate at slow-speed year-round within the manatee refuge except:
 - from June 1 to August 15, watercraft may operate at speeds up to 25 miles per hour, during daylight hours (sunrise to sunset), in a portion of the manatee refuge generally northeast, north, and northwest of Buzzard Island, as marked, exclusive of slow speed shoreline buffer areas where manatee use is highest; and
 - where more restrictive measures are in place (*e.g.*, idle speed zones, no-entry areas).
- To minimize the potential for attraction of manatees into harm’s way in the high speed area, the rule prohibits anchorage (other than emergency anchorage) of watercraft in the high speed area from June 1 through August 15.
- The Service would have the ability to designate temporary no-entry areas in Kings Bay between November 15 and March 31 in Kings Bay to specified distances outside the existing sanctuaries and at House Spring, Jurassic Spring, and Idiot’s Delight Number 2 Spring, as follows:

- For all existing Federal manatee sanctuaries, with the exception of Three Sisters Sanctuary, to a distance not to exceed 100 feet from the existing sanctuary boundary.
- For the Three Sisters Sanctuary, to a distance not to exceed 400 feet from the existing boundary. We do not intend to completely mark off the manmade channel. Expansion could occur directly around the existing sanctuary and north into the area locally known as Three Sisters Springs.
- For House Spring and Jurassic Spring, an area that does not exceed 100 feet from the associated spring vent.
- For Idiot's Delight Number 2 Spring, an area that does not exceed 25 feet from the associated spring vent. Any temporary designation will be configured to avoid the manmade channel in the canal and will not block access into Three Sisters Springs.
- The Service would have the ability to designate temporary no-entry areas between April 1 and November 14 for no more than 14 days just before or after the manatee season (November 15 through March 31) in Kings Bay to specified distances (described in the previous bullet) outside the existing sanctuaries and at House Spring, Jurassic Spring, and Idiot's Delight Number 2 Spring;
- 12 specifically prohibited activities throughout the manatee refuge at all times:
 - Chasing or pursuing a manatee(s).
 - Disturbing or touching a resting or feeding manatee(s).
 - Diving from the surface onto resting or feeding manatee(s).
 - Cornering or surrounding or attempting to corner or surround a manatee(s).
 - Riding, holding, grabbing, or pinching or attempting to ride, hold, grab, or pinch a manatee(s).
 - Poking, prodding, or stabbing or attempting to poke, prod, or stab a manatee(s) with anything, including your hands and feet.
 - Standing on or attempting to stand on a manatee(s).
 - Separating a mother and calf or attempting to separate a mother and calf.
 - Separating a manatee(s) from a group or attempting to separate a manatee(s) from a group.
 - Giving a manatee(s) anything to eat or drink or attempting to give a manatee(s) anything to eat or drink.
 - Actively initiating contact with a belted and/or tagged manatee(s) and associated gear, including any belts, harnesses, tracking devices, or antennae.
 - Interfering with rescue and research activities.
- Within Three Sisters Springs, the following waterborne activities would be prohibited between November 15 and March 31:

- All waterborne activities in Three Sisters Springs between sunset and sunrise.
- Scuba diving.
- Fishing, including but not limited to fishing by hook and line, by cast net, or by spear.
- Adjoining property owners, their guests, employees, and their designees (including but not limited to contractors and lessees) may engage in watercraft access and property maintenance activities through manatee sanctuaries and designated no-entry areas. Use of sanctuary and no-entry area waters is restricted to authorized individuals accessing adjoining properties, storing watercraft, and maintaining property and waterways.
 - Authorized individuals must obtain a sticker or letter of authorization from the Service identifying them as individuals authorized to enter no-entry areas that adjoin their property.
 - Authorized individuals must conduct any authorized boating activity within these areas at idle or no-wake speeds.

No sticker or letter of authorization is required for property owners, their guests, employees, and their designees (including but not limited to contractors and lessees) whose property does not adjoin a manatee sanctuary or designated no-entry zone. These property owners will not need to enter a manatee sanctuary or designated no-entry area to gain access to their property and therefore will not need or be issued a sticker or letter of authorization.

1.3.3 Comparison of Alternatives

The relative effects of each of the alternatives, including the No Action alternative, on existing management measures are summarized in Table 3. The table provides an overview of the analysis and a comparison of the alternatives.

Table 3. Comparison of Alternatives

| Existing Measures | Alternative A | Alternative B | Alternative C | Alternative D | Alternative E | Alternative F |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Network of manatee protection areas in Kings Bay | No change | Change | Change | No change | No change | Change |
| Harassment regulations | No change | No change | No change | Change | No change | No change |
| Federal and State law enforcement efforts | No change | No change | No change | No change | Change | No change |

Alternative A: No Action

Alternative B: Designate a Kings Bay Manatee Refuge

Alternative C: Modify existing network of manatee protection areas

Alternative D: Promulgate harassment regulations

Alternative E: Increase/enhance law enforcement

Alternative F: Modified Alternative B - Designate a Kings Bay Manatee Refuge

1.4 Permitting Requirements and Authorizations Needed

Pursuant to section 7(a)(2) of the ESA, the Service will conduct an intra-service consultation to ensure that the preferred alternative will not jeopardize the continued existence of any listed species nor result in the adverse modification of any critical habitat.

This EA has been prepared in compliance with all applicable Federal statutes, regulations and executive orders (EO) including, but not limited to, the following:

- National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [U.S.C.] 4321 *et seq.*)
- Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508)
- U.S. Fish and Wildlife Service Manual, Part 550, Chapter 1 (National Environmental Policy Act - Policy and Responsibilities) and Chapter 2 (National Environmental Policy Act Compliance Guidance)
- Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, as amended)
- Marine Mammal Protection Act (MMPA) of 1972 (16 U.S.C. 1361-1407, as amended)
- Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 *et seq.*, as amended)
- Clean Air Act of 1972 (42 U.S.C. 7401-7671, as amended)
- Clean Water Act (CWA) of 1977 (33 U.S.C. 1251 *et seq.*)
- Migratory Bird Treaty Act of 1918
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Protection of Historic and Cultural Properties (36 CFR 800 *et seq.*)
- Federal Noxious Weed Act (7 U.S.C. 2801)
- E.O. 11514, Protection and Enhancement of Environment Quality
- E.O. 11593, Protection and Enhancement of the Cultural Environment
- E.O. 11988, Floodplain Management
- E.O. 11990, Protection of Wetlands
- E.O. 12898, Environmental Justice
- E.O. 13112, Invasive Species Management
- E.O. 13186, Protection of Migratory Birds.

In addition, all action alternatives will comply with the Service's Florida Manatee Recovery Plan (USFWS 2001) and the Service's status review of the West Indian manatee (USFWS 2007). All action alternatives will also be consistent with FWC's Florida Manatee Management Plan (FWC 2007).

Chapter 2: Affected Environment and Environmental Consequences

2.1 Affected Environment

2.1.1 Human Environment

The shorelines surrounding Kings Bay are populated by wetland areas, waterfront homes, and numerous subdivisions. Recreational and commercial activities associated with the bay's distinctive habitat and wildlife provide significant support for the local economy. Recreational activities known to occur in Kings Bay include cruising, waterskiing, personal watercraft use, canoeing and kayaking, manatee viewing, snorkeling and diving, and fishing. Commercial activities include eco-tour businesses, boat charters, and commercial fisheries (primarily crabbing).

2.1.2 Biological Environment

Kings Bay is a 530-acre embayment at the headwaters of the tidally influenced Crystal River. The headwaters include a first magnitude spring system with an average total discharge rate of 975 cubic feet per second (SWFWMD 2004). Kings Bay's water quality is largely compromised by nutrient loading, primarily introduced into the system from the 30 springs that provide water to the bay. Other nutrient sources include sewage treatment effluents, septic tank leachate, and stormwater runoff. Excess nutrients fuel the growth of algae and inherent declines in water clarity and rooted aquatic plants. Water quality is declining and efforts are being made to reduce the amount of nutrients entering the bay.

Kings Bay's waters are home to a diverse assemblage of local aquatic and water-dependent species, including: 21 species of amphibians, 191 species of birds, 22 species of mammals, and 47 species of reptiles. Predominant plant species found here include: *Myriophyllum spicatum*, *Lyngbya* sp., *Vallisneria americana*, *Potamogeton pectinatus*, *Najas guadalupensis*, *Hydrilla verticillata*, *Chara* sp. and *Ceratophyllum demersum* (SWFWMD 2004).

Federally protected species known to occur in the area include the Florida manatee, Gulf sturgeon (*Acipenser oxyrinchus desotoi*), wood stork (*Mycteria americana*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and Kemp's ridley sea turtle (*Lepidochelys kempii*). There are no known protected plant species in Kings Bay.

2.2 Environmental Consequences

This section describes aspects of the environment that may potentially be affected by each of the alternatives.

2.2.1 Alternative A - No Action

2.2.1.1 Impacts to Human Environment

This alternative would not change existing human environment conditions, including human safety, economy, or recreational and public access. In the absence of actions to reduce increasing manatee harassment activity and watercraft-related manatee injuries and deaths, litigation and other actions could result in greater restrictions that could, eliminate many local eco tour activities and have significant effects on the local economy.

2.2.1.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under the no action alternative.

The number of manatees taken by harassment and watercraft-related injuries and deaths would continue to increase.

Summary – Alternative A

Alternative A would not meet the purpose and need of the proposed action. This alternative would neither minimize the take of manatees by otherwise lawful activities in Kings Bay nor minimize human disturbance in a sensitive manatee wintering (sheltering) area.

2.2.2 Alternative B - Designate a Kings Bay Manatee Refuge

This alternative was put forward as a proposed rule on June 22, 2011 (76 FR 36493).

2.2.2.1 Impacts to Human Environment

Potential affects to the human environment for this alternative include impacts to (1) human safety, (2) socioeconomic conditions, and (3) recreational and public access to the waters of Kings Bay.

Human Safety

There are two aspects of this alternative relative to the human safety: (1) if the summer watersports zone is replaced by a slow-speed restriction, high speed recreational watercraft operators would most likely be displaced to the 25 MPH speed zones in the narrow channel of Crystal River and (2) the current watersports zone configuration in Kings Bay is unsafe. The Service sought and reviewed Florida Fish and Wildlife Conservation Commission boating accident records in Crystal River and Kings Bay. Review of that information revealed that since 2000, there were eight boating accidents reported in Kings Bay. Those accidents resulted in four injuries. In Crystal River, there were 24 accidents reported since 1998. Those accidents resulted in 12 injuries and one fatality. This information gave credence to public comments regarding human safety in both Crystal River and Kings Bay.

The Service requested that the U.S. Coast Guard (USCG) evaluate the human safety aspects of Alternative B (the proposed rule). In an October 7, 2011 memorandum, the USCG conveyed

their concern that the closure would result in the displacement of high speed watercraft activity into the Gulf of Mexico and the connecting waters of Crystal River, with the latter being the more likely of the two options due to the 2-hour transit time from Kings Bay to the Gulf. Crystal River has a narrow high speed channel and it is the USCG's determination that this increase in traffic would result in unsafe conditions for watercraft operators by "greatly increasing the danger of boating safety infractions and marine casualties including vessel collisions, potentially involving serious bodily injury."

Socioeconomic Conditions

In order to gauge the economic impact of this alternative, both benefits and costs are considered. Potential economic benefits related to this alternative include: increased manatee protection and tourism related to manatee viewing, increased property values, increased watercraft operator safety, increased swimmer safety, improved fisheries health, and decreased shoreline maintenance costs. Potential economic costs are related to increased administrative activities related to implementing the rule and restrictions on certain waterborne activities. Economic costs consider the number of recreationists who use alternative sites for their activity or have a reduced quality of the waterborne activity experience in the designated manatee refuge. The effect of slower speeds on commercial fishermen is also considered.

Economic Benefits

The Service believes this alternative will increase the level of manatee protection in this area. Improved protection for the manatee may result in direct economic benefits by ensuring the continued, local presence of viewable manatees and the continued existence of the manatee viewing industry. Indirect benefits include the protection of private and publicly owned shorelines from high-speed wakes, the protection of aquatic vegetation from losses due to excessive turbidity caused by high-speed boat traffic, increased property values, and reductions in high-speed boating-related human deaths and injuries within the boundaries of the manatee refuge.

The public's support for manatees and their protection has been examined through contingent value studies (Solomon *et al.* 2004; Bendle and Bell 1995; Fishkind and Associates 1993). These economic studies characterized the value placed by the public on this resource and determined that the public's willingness to pay for manatee protection is significant and that public support for manatee protection regulations in general, such as that described in the rule, exists.

Bendle and Bell (1995) conducted a representative survey of Florida residents in general (through random sample) and attempted to answer the question, "How much are Florida residents willing to pay to cover the costs associated with protecting the manatee?" In 1993 dollars, efforts to protect the manatee population as a whole were valued at an estimated \$2.6 billion or \$14.78 per household (or \$4.03 billion or \$22.91 per household, when adjusted to reflect 2011 monetary values). Based on surveys of north Florida residents, Fishkind and Associates (1993) estimated that adult Florida residents would be willing to pay \$30 per year in 1992 dollars (or \$47.70 per year when adjusted to reflect 2011 monetary values) to help

compensate for the adverse economic effects, if any, of protecting the manatee population (Fishkind and Associates 1993).

It is difficult to apply the results of these studies to this alternative, because they do not measure an impact similar to that associated with the alternative. For example, the Fishkind and Associates study (1993) was designed to gauge the economic impact of the Florida Manatee Sanctuary Act. First, the estimates of economic benefit were predicated on a different baseline in terms of both the manatee population being protected at that time versus now, and the regulatory conditions, such as manatee protection areas, that were in existence at the time. Second, this study is not clear about the type and extent of manatee protection; it does not clearly state if protection refers solely to the designation of manatee protection areas or if protection is interpreted to include implementation and enforcement of protection measures. The study also does not clearly state whether residents are willing to pay for manatee protection within a specific region or for manatee protection throughout the State of Florida. While neither of these studies is specific enough to apply to this alternative, they do provide an indication that the public confers substantial value on the protection of manatees.

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Another potential economic benefit is continued and increased tourism that likely results from an increase in manatee protection. Citrus County and Kings Bay are nationally and internationally recognized as a primary destination for winter-time manatee viewing. Surveys of visitors to Citrus County estimate that about half come to enjoy water-based activities, including manatee viewing, snorkeling, and diving (in order of preference) (Gold 2008). Hundreds of thousands of individuals are believed to engage in this activity each winter, and the number of participants is thought to be increasing.

Visitors and local residents view manatees in Kings Bay from boats or in-water on their own or through local eco-tour operators. Visitors may pay eco-tour operators to equip them and take them out onto Kings Bay to view manatees; vendors provide both in-water and on-water experiences. In-water rentals include wetsuits, masks, snorkels, and related gear. On-water rentals include canoe, kayak, and other boat-type rentals. Other visitors travel to the area and engage in manatee viewing activities using their own equipment, including boats and other

needed gear. Many visitors to the area stay at local hotels and eat at local restaurants. There are no reports or estimates of direct costs and expenditures associated with the manatee viewing activity.

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Businesses that benefit both directly and indirectly from manatee viewing activities can be found in Department of Labor descriptions of Citrus County industries. While these industry descriptions provide useful information about numbers of businesses and the number of individuals employed in them, they do not describe the number of businesses and individuals engaged directly or indirectly in manatee viewing activities. These industries include: leisure and hospitality businesses, professional and business services; and trade, transportation, and utility businesses. Through September 2010, there were 288 leisure and hospitality establishments in Citrus County employing 3,294 individuals; 512 professional and business service establishments employing 3,340 individuals; and 683 trade, transportation, and utility establishments employing 7,330 individuals (U.S. Department of Labor 2011).

Improved protection for the manatee may result in an economic benefit to these industries by ensuring the continued local presence of viewable manatees and the continued existence of the manatee viewing industry. However, the viability of the local manatee viewing industry, as practiced by both commercial businesses and individuals, is challenged by reported acts of manatee harassment associated with these activities.

Florida waterfront property owners may benefit from manatee protection areas such as the area described in this proposal. Bell and McLean (1997) studied the impact of posted manatee speed zones on the property values of waterfront homes in Fort Lauderdale, Broward County, Florida. The authors found a strong relationship between property values and slow-speed zones, and found evidence that slow-speed zones may have a positive impact on home sale price. Slow-speed zones were found to correlate with as much as a 15 to 20 percent increase in sale price. The authors speculated that speed zones may increase property values by reducing noise and fast traffic, as well as making it easier for boats to enter and leave primary waterways. Within the area covered by this alternative, there are shoreline areas where residential property owners may experience these benefits.

In addition, due to reductions in boat wake associated with speed zones, property owners may experience some economic benefits related to decreased costs for maintenance and repair of shoreline stabilization (*i.e.*, seawalls along the water's edge). Similarly, the erosion of shoreline vegetation and aquatic plant communities from boat wakes will lessen, thus improving important fisheries habitat. Speed reductions may also result in increased boater and swimmer safety. These types of benefits cannot be quantified with available information.

Based on previous studies, we believe that this alternative would produce some economic benefits. However, given the lack of information available for estimating these benefits, the magnitude of these benefits is unknown.

Economic Impacts

Affected Recreational Activities: For some waterway users, the loss of a local, high-speed watersports area may reduce the quality of these waterborne activities or may cause them to forgo the activity. The extra time needed to cross additional slow and/or idle speed areas or to avoid "no-entry" areas may inconvenience some recreationists. In this section, we examine the waterborne activities taking place in the area and the extent to which they may be affected by the designation of a manatee refuge under Alternative B. The resulting potential economic impacts are discussed below.

In the Alternative B, affected waterborne activities include traveling, cruising, waterskiing, personal watercraft use, canoeing and kayaking, manatee viewing, snorkeling and diving, and fishing. Based on a recent visitor study that relied on a variety of survey mechanisms, the two most popular activities in Citrus County were manatee viewing and snorkeling/diving (Gold 2008). Recreationists engaging in high-speed activities, including waterskiing, use of personal watercraft, and other similar activities will likely experience some impacts with this alternative;

individuals not engaged in high-speed-related activities, such as kayakers, are unlikely to experience much impact with this alternative.

Primary activities that will be affected by the designation of year-round slow and/or idle speeds are those that involve high-speed watercraft operations, including waterskiing, which take place between May 1 and August 31 in the watersports area around Buzzard Island located in the center of Kings Bay. This alternative may cause some water skiers and other recreationists to forgo high-speed activities here, or may reduce the quality of their experience in the event that these recreationists elect to waterski at less preferred alternative sites.

Without data describing the number of affected recreationists and the number of trips that they make every year to the watersports area, costs associated with the loss of this area are unknown. If this information were available, we could estimate the impact of lost or diminished skiing days given the value of a waterskiing day published in the literature. One study by Bergstrom and Cordell (1991) suggested the lost surplus value may be \$46.75 per day (adjusted to reflect 2002 monetary values) for a day of waterskiing. They applied a multi-community, multi-site travel cost model to estimate demand equations for 37 outdoor recreational activities and trip values, including waterskiing. The analysis was based on nationwide data from the Public Area Recreational Visitors Study collected between 1985 and 1987 and several secondary sources.

Thomas and Stratis (2002) evaluated the effect that reductions in the number of available boating destinations had on recreational boaters in Lee County. Reduced boat speeds at certain sites precluded high-speed activities historically associated with these sites, reducing the number of high-speed destinations available to these boaters. Thomas and Stratis demonstrated that some redistribution of boating trips did subsequently occur and concluded that the reduction in boating destinations resulted in an annual estimated loss per boater of \$423.94 in 1996 dollars (or \$597.97 when adjusted to reflect 2011 dollar values). The study was conducted in Lee County, not Citrus County, in 1996, and specific locations and 1996 values localize and date the results.

While studies demonstrate that recreationists can experience a change in the quality of their waterborne experience when speeds are restricted in historical high-speed boater destinations, not enough data are available to estimate any losses in economic value that these recreationists who use Kings Bay are likely to experience.

Recreationists who transit the designated, summertime slow-speed area will likely experience a diminished quality of the boating experience due to the additional time needed to transit this area at speeds slower than those historically present. These recreationists likely include anglers traveling to downstream fishing sites, and the additional transit times will affect the time that they have available to fish. Lost fishing time could result in catch losses, thereby diminishing the fishing experience. The number of these recreationists and the number of trips that they make is unknown. However, because the area under consideration is relatively small, increased transit times may increase as much as 10 to 15 minutes one way. As a result, the economic cost of this rulemaking on these individuals cannot be quantified, but are likely to be minimal.

Affected Commercial Charter Boat Activities: Various types of charter boats use Citrus County waterways for nature tours and other activities. The number of charter boats using Kings Bay is unknown, and information on their origins and destinations is lacking. However, many charter boats are used by renters to view manatees, an activity that occurs within the area covered by this alternative. A manatee refuge designation is unlikely to cause a significant adverse impact to businesses that provide boats for manatee viewing and may even benefit them. Enhanced manatee protection measures should improve the viewing experience and are likely to positively affect this industry. The extra time required for commercial charter boats used for fishing to reach fishing grounds could reduce onsite fishing time and could result in fewer trips. Added travel time may affect the length of a trip, which could result in fewer trips overall, creating a potential economic impact. However, because the area under consideration is relatively small, increased transit times may increase as much as 10 to 15 minutes one way. The economic cost of this rulemaking on these activities cannot be quantified, but are likely to be minimal.

Affected Commercial Fishing Activities: Local commercial fisheries may experience some impact under this alternative. To the extent that Alternative B establishes additional speed zones in commercial fishing areas, this may increase transit times associated with the fishing activity, affecting the efficiency of commercial fishing. Costs associated with requirements for the use of manatee-safe float lines will likely increase some fishing gear costs.

Crab boats would have to travel at slower speeds in some locations between crab pots, thereby potentially reducing the number of crabs landed on a daily basis. The speed limits may also slow transit speeds between fishing grounds for both crab and mullet fishing boats. The number of fishing boats operating and the amount of blue crab and mullet landings occurring in areas that will be newly designated speed zones under this alternative is unknown. Given this, the impact on the commercial fishing industry cannot be quantified.

Crabbers fishing within the area will need to modify their gear to ensure that manatees do not become entangled in crab pot float lines. The use of stiffened lines, including lines that incorporate stiffeners (wire, lines enclosed in hose or PVC, etc.), crab pot lines to reduce the number of float lines used (where crab pots are strung together and single float lines are used to locate the beginning and end of such a crab pot line), and other methods will increase gear costs. However, the number of crabbers fishing in Kings Bay is unknown, and the extent to which this will impact these users is unknown.

This alternative would likely affect commercial fishermen by way of added travel time, which may result in an economic impact. However, because added travel times are unlikely to exceed an additional 30 minutes beyond existing travel times, it is unlikely that this alternative will result in a significant economic impact on the commercial fishing industry.

Agency Administrative Costs: Agency administrative costs would include costs associated with signposting, enforcement, and some costs for education and outreach to inform the public about new designations within the area covered by the alternative. This alternative would require nominal, additional signposting activities; however, the number and location of signs needed to post the manatee refuge is not known. Some existing signs may be removed and

reused. Additional law enforcement and education and outreach needs are anticipated. Associated administrative costs are unknown.

This alternative would affect less than 530 acres of the State of Florida's 7.5 million acres of waterways and add restrictions to an already-restricted area to better protect manatees. As a result, the alternative would impact the quality of waterborne activity experiences for some recreationists and may lead some recreationists to forgo certain waterborne activities. While this alternative would prohibit certain activities within the manatee refuge area, it does not prohibit recreationists from participating in similar activities elsewhere. Alternative sites are available for all waterborne activities that may be affected by this alternative. The inconvenience of having to go slower or choose alternative sites for certain waterborne activities would likely have a regional economic cost. While the level of economic benefits that may be attributable to the manatee refuge is unknown (including benefits associated with manatee viewing), these benefits would likely minimize any economic impacts that may be associated with this rule. Given available information, the net economic impact of designating this manatee refuge is not expected to exceed \$100 million per year.

Recreation and Public Access

This alternative would modify recreational activities and current waterway access practices in Kings Bay due to changes in boat speed and access limitations. These limitations would impact the quality of waterborne activity experiences for some recreationists and may lead some recreationists to forgo certain waterborne activities. While the alternative would prohibit certain activities within the manatee refuge area, it would not prohibit recreationists from participating in similar activities elsewhere. Alternative sites are available for all waterborne activities that may be affected by this rule.

2.2.2.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under the no action alternative.

Adoption of this alternative would minimize the take of manatees through harassment, injury, or death as a result of waterborne activities. Additionally, this alternative would allow greater management flexibility to minimize human disturbance in a sensitive manatee wintering area.

Summary – Alternative B

The purpose of creating a manatee refuge under Subpart J is to “prevent the take of one or more manatees.” Alternative B, therefore, would meet the purpose and need of the proposed action to minimize the take of manatees by otherwise lawful activities in Kings Bay and minimize human disturbance in a sensitive manatee wintering (sheltering) area. Additionally, we recognize that this alternative would increase human safety in Kings Bay by not allowing watercraft to operate above slow speed. However, because this alternative is likely to exacerbate human safety concerns in adjacent waters, this alternative is not considered to be feasible.

2.2.3 Alternative C - Modify Sanctuaries

2.2.3.1 Impacts to Human Environment

This alternative would have the same potential impacts to the human environment as that of Alternative B.

2.2.3.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under this alternative.

Modifications to the existing local network of manatee protected areas would provide a temporary respite to increasing numbers of manatee harassment reports, injuries, and deaths in Kings Bay. However, additional rulemakings would continue to be needed to address increasing numbers of takings that would likely accrue in the face of growing numbers of manatees, recreationists, and watercraft.

Summary – Alternative C

Alternative C would not meet the purpose and need of the proposed action in its entirety. While the alternative would minimize the take of manatees by some otherwise lawful activities in Kings Bay, and minimize some forms of human disturbance in a sensitive manatee wintering (sheltering) area, other forms of take (particularly harassment resulting from manatee viewing activities) would not be clearly defined, and therefore not clearly enforceable. As with Alternative B, we recognize that this alternative would increase human safety in Kings Bay by not allowing watercraft to operate above slow speed. However, because this alternative is likely to exacerbate human safety concerns in adjacent waters, this alternative is not considered to be feasible.

2.2.4 Alternative D - Promulgate Harassment Regulations

2.2.4.1 Impacts to Human Environment

This alternative would not change existing human environment conditions, including human safety, economy, or recreational and public access. In the absence of actions to reduce increasing manatee harassment activity and watercraft-related manatee injuries and deaths, litigation and other actions could result in greater restrictions that could, eliminate many local eco tour activities and have significant effects on the local economy.

2.2.4.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under this alternative.

In light of difficulties associated with enforcing the described harassment regulation modifications, this alternative would not be likely to reduce the numbers of manatees harassed, injured, and killed by recreationists and waterway users in Kings Bay.

Summary – Alternative D

Alternative D would not meet the purpose and need of the proposed action in its entirety. While the alternative may minimize the take of manatees by some otherwise lawful activities (e.g., manatee viewing) in Kings Bay, it would not minimize take associated with other activities, such as watercraft operation nor would it minimize human disturbance in a sensitive manatee wintering (sheltering) area.

2.2.5 Alternative E - Increase/Enhance Law Enforcement

2.2.5.1 Impacts to Human Environment

This alternative would not change existing human environment conditions, including human safety, economy, or recreational and public access. In the absence of actions to reduce increasing manatee harassment activity and watercraft-related manatee injuries and deaths, litigation and other actions could result in greater restrictions that could, eliminate many local eco tour activities and have significant effects on the local economy.

2.2.5.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under this alternative.

Additional officers and equipment would improve and enhance existing enforcement efforts and would likely reduce the numbers of manatees taken by harassment and watercraft-related manatee injuries and deaths. However, these additions would provide a partial means with which to reduce these takings and would not fully address problems faced by manatees in the area.

Summary – Alternative E

Alternative E would not meet the purpose and need of the proposed action in its entirety. This alternative would not minimize the take of manatees by otherwise lawful activities in Kings Bay, but may minimize human disturbance in a sensitive manatee wintering (sheltering) area. However, without clear guidance as to what constitutes "take" by harassment, law enforcement

officers would still have difficulty enforcing current protection measures. Additionally, budgetary constraints at both the State and Federal levels reduces the likelihood that this could action could be sustained over time

2.2.6 Alternative F – Modified Alternative B – Designate a Kings Bay Manatee Refuge (Preferred)

2.2.6.1 Impacts to Human Environment

Potential affects to the human environment for this alternative include impacts to (1) human safety, (2) socioeconomic conditions, and (3) recreational and public access to the waters of Kings Bay.

Human Safety

This alternative sought to address the human safety concern raised in Alternative B, that if the summer watersports zone is replaced by a slow-speed restriction, high speed recreational watercraft operators would most likely be displaced to the 25 MPH speed zones of the narrow channel of Crystal River, resulting in unsafe conditions for watercraft operators.

The Service presented the USCG with a modification to Alternative B (the proposed rule) that would allow some level of high speed watercraft recreation in Kings Bay, but would also provide greater protection to manatees than the current conditions. The USCG reviewed the modifications and agreed that the modifications alleviated their concerns about human safety. This alternative would allow continued use of a portion of Kings Bay for high speed recreation, and therefore is less likely to result in additional recreational pressure in Crystal River during the peak summer use period.

With respect to comments that Alternative B would increase human safety in Kings Bay due to removal of the watersports area, the Service agrees that it intuitively makes sense that slowing down watercraft speed throughout the Bay would increase the safety of non-motorized and slow speed recreation users. However, the Service must consider the effect of the rule to not only the waters of Kings Bay, but to the surrounding waters as well. That being said, we believe that the modifications presented in Alternative F provide increased human safety as well as increased manatee safety over the current conditions by requiring slow watercraft operation in the constricted areas of Kings Bay immediately east, west, and south of Buzzard Island, except where more restrictive speed zones are already in place.

Socioeconomic Conditions

The Service acknowledges that this alternative may have some local economic effect that could be positive or negative. However, we believe that revisions to Alternative B (the proposed rule) reflected in Alternative F to avoid human safety concerns also result in a reduction in potential negative economic impacts. Regulatory impact analyses require the comparison of expected costs and benefits of the rule against a baseline, which typically reflects the regulatory requirements in existence prior to the rulemaking. For purposes of this analysis, the baseline

assumes that the Service takes no additional regulatory actions to protect the manatee. In fact, even with no further activity by the Service, an extensive system of manatee protection areas is already in place within the area of the manatee refuge.

The primary economic consideration in this alternative versus Alternative B is the change in the type and extent of certain waterborne activities for a period of 46 days (that is May 1-31 and August 16-31) due to reduction in both time and space of the area known as the “watersports area,” a State-designated speed zone in effect since 1992. Based on public comments, there may be minimal increases in certain types of watersports such as swimming, diving, and kayaking/canoeing and minimal decreases in motorized watersports and commercial crabbing. There may be some increase in economic benefits such as reduced water-front property maintenance costs and reduced cost of rescue and rehabilitation cost for injured manatees. There may be some increase in economic impact due to gear requirements for anchorage and commercial crabbing. However, the economic effects of these changes, whether slightly positive or negative, will be limited. The Service will experience increased administrative costs of \$100,000 or less due to modified posting requirements, revisions in maps and educational materials, and enforcement.

Economic Benefits

We believe this alternative to establish the Kings Bay Manatee Refuge would increase the level of manatee protection in these areas. Improved protection for the manatee may result in direct economic benefits by ensuring the continued, local presence of viewable manatees and ensuring the continued existence of the manatee viewing industry. Indirect benefits include the protection of private and publicly owned shorelines from high-speed wakes and the protection of aquatic vegetation from losses due to excessive turbidity caused by high-speed watercraft traffic.

The public’s support for manatees and their protection has been examined through contingent value studies (Solomon *et al.* 2004, pp. 101-115; Bendle and Bell 1995, pp. 8-17; Fishkind and Associates 1993, pp. 5-11). These economic studies characterized the value placed by the public on this resource and determined that the public’s willingness to pay for manatee protection is significant and that public support for manatee protection regulations in general, such as that described in this alternative, exists.

Bendle and Bell (1995, p. ii) conducted a representative survey of Florida residents in general (through random sample) and attempted to answer the question, “How much are Florida residents willing to pay to cover the costs associated with protecting the manatee?” In 1993 dollars, efforts to protect the manatee population as a whole were valued at an estimated \$2.6 billion or \$14.78 per household (or \$4.03 billion or \$22.91 per household, when adjusted to reflect 2011 monetary values). Based on surveys of north Florida residents, Fishkind and Associates (1993, p. 11) estimated that adult Florida residents would be willing to pay \$30 per year in 1992 dollars (or \$47.70 per year when adjusted to reflect 2011 monetary values) to help compensate for the adverse economic effects, if any, of protecting the manatee population (Fishkind and Associates 1993, pp. 28-30).

It is difficult to apply the results of these studies to this alternative because they do not measure an impact similar to that associated with this rulemaking. For example, the Fishkind and Associates study (1993, p. 1) was designed to gauge the economic impact of the Florida Manatee Sanctuary Act. First, the estimates of economic benefit were predicated on a different baseline in terms of both the manatee population being protected at that time versus now, and the regulatory conditions, such as manatee protection areas, that were in existence at the time. Second, this study is not clear about the type and extent of manatee protection; it does not clearly state if protection refers solely to the designation of manatee protection areas or if protection is interpreted to include implementation and enforcement of protection measures. The study also does not clearly state whether residents are willing to pay for manatee protection within a specific region or for manatee protection throughout the State of Florida. While neither of these studies is specific enough to apply to this rule, they do provide an indication that the public confers substantial value on the protection of manatees.

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While information on the number of boats associated with manatee viewing (including boats used by residents, boats trailered to the area by visitors, boats used to transport eco-tour clients, or boats leased to individuals watching manatees) is not complete, a recent evaluation on the impact of boating on Florida, Florida's North Central Region, and Citrus County suggests that the overall economic impact of manatee viewing is important (FWC 2009 Online Boating Economic Impact Model website). The Crystal River NWR receives visitor reports from dive shops and kayak outfitters holding SUPs. Reports received to date show that at least 67,856 visitors went to either King Spring and/or Three Sisters Spring in 2010 (Crystal River NWR unpublished report). Of that total, 41,679 were guided visitors and 26,177 were non-guided visitors (i.e., rentals). However, annual visitation to these two sites increases to well over 100,000 when private boats and kayaks are included (I. Vicente, Crystal River NWR, 2011, pers. com.). The highest visitation in 2010 occurred in April with over 8,000 reported visitors (the most ever reported for a single month), followed by March, July, December, February in descending order of total visitation. In 2009, the top five months were February, March, April, January and July.

FWC's 2006 evaluation of Citrus County boating activities documented 14,304 county-registered boats (13,283 power boats and 1,021 non-power boats, including 903 kayaks and canoes) and 402,029 boat days in Citrus County waters. Over 60 percent of the boat trips taken by these boats occurred in Citrus County. Local boat ramp infrastructure emphasizes salt water destinations (calculated 2006 ramp lane capacities provide access for 10,620 launches, including 8,883 saltwater launches and 1,737 freshwater launches). The economic significance of Citrus County's registered boats and their activities is estimated at \$104,740,000 annually in 2006 dollars (or \$116,261,400 when adjusted to reflect 2011 monetary values); \$63,513,400 (or \$70,449,874 in 2011 monetary values) of this amount is spent on boat trips, including \$8,549,200 (or \$9,489,612 in 2011 monetary values) on lodging (14 percent) and \$9,060,500 (or \$10,057,155 in 2011 monetary values) on food. The evaluation does not assess nonresident (or out-of-state) boats. The fraction of county-registered boats used for manatee viewing in Kings Bay is unknown, as is the number of boats trailered to the area by visitors. As such, the contribution of boats used for manatee viewing cannot be monetized or evaluated in terms of any economic benefit likely to accrue under this alternative.

Businesses that benefit both directly and indirectly from manatee viewing can be found in Department of Labor descriptions of Citrus County industries. While these industry descriptions provide useful information about numbers of businesses and the number of individuals they employ, they do not describe the number of businesses and individuals engaged directly or indirectly in manatee viewing. These industries include: leisure and hospitality businesses, professional and business services; and trade, transportation, and utility businesses. Through September 2010, there were 288 leisure and hospitality establishments in Citrus County employing 3,294 individuals; 512 professional and business service establishments employing 3,340 individuals; and 683 trade, transportation, and utility establishments employing 7,330 individuals (U.S. Department of Labor 2011).

Improved protection for the manatee may result in an economic benefit to these industries by insuring the continued local presence of viewable manatees and insuring the continued existence of the manatee viewing industry. However, the viability of the local manatee viewing industry,

as practiced by both commercial businesses and individuals, is challenged by reported acts of manatee harassment associated with these activities.

Florida waterfront property owners may benefit from manatee protection areas such as the area described in this alternative. Bell and McLean (1997, p. 1) studied the impact of posted manatee speed zones on the property values of waterfront homes in Fort Lauderdale, Broward County, Florida. The authors found a strong relationship between property values and slow-speed zones, and found evidence that slow-speed zones may have a positive impact on home sale price. Slow-speed zones were found to correlate with as much as a 15- to 20-percent increase in sale price. The authors speculated that speed zones may increase property values by reducing noise and fast traffic, and by making it easier for boats to enter and leave primary waterways. In the manatee refuge area, residential property owners may experience these benefits.

In addition, due to reductions in boat wake associated with speed zones, property owners may experience some economic benefits related to decreased costs for maintenance and repair of shoreline stabilization (*i.e.*, seawalls along the water's edge). Similarly, the erosion of shoreline vegetation and aquatic plant communities from boat wakes would lessen, thus improving important fisheries habitat. Speed reductions may also result in increased boater and swimmer safety. These types of benefits cannot be quantified with available information.

Based on previous studies, we believe that this alternative would produce some economic benefits. However, given the lack of information available for estimating these benefits, the magnitude of these benefits is unknown.

Economic Impacts

Affected Recreational Activities: For some waterway users, the reduced window for high-speed watersports activity may cause people to forgo some of these activities for a period of time. The extra time needed to cross additional slow and/or idle speed areas or to avoid "no-entry" areas may inconvenience some recreationists. In this section, we examine the waterborne activities taking place in the area and the extent to which they may be affected by the designation of a manatee refuge. The resulting potential economic impacts are discussed below.

In the area covered by this alternative, affected waterborne activities include traveling, cruising, waterskiing, personal watercraft use, canoeing and kayaking, manatee viewing, snorkeling and diving, and fishing. Based on a recent visitor study that relied on a variety of survey mechanisms, the two most popular activities in Citrus County were manatee viewing and snorkeling/diving (Gold 2008, pp. 4-8). Recreationists engaging in high-speed activities, including waterskiing, use of personal watercraft, and other similar activities would likely experience some impacts due to the rule; individuals not engaged in high-speed-activities, such as kayakers, may increase these activities given the reduction in high speed watercraft traffic.

Primary activities that would be affected by the reduction in time and space of the watersports area around Buzzard Island are those that involve high-speed watercraft operations, including waterskiing. This alternative reduces the area in which high-speed watercraft

operation can occur to a posted area generally north of Buzzard Island, excluding shoreline buffers. Additionally, the alternative reduces the time of year in which this posted area would be available for high-speed operation from the previous time frame of May 1 through August 31 to June 1 through August 15, and restricts high-speed operations during this time frame to daylight hours. During this 46-day period when the high-speed watersports is no longer allowed in Kings Bay, this alternative may cause some water skiers and other recreationists to forgo high-speed activities here, or may reduce the quality of their experience in the event that these recreationists elect to use less preferred alternative sites.

Without data describing the number of affected recreationists and the number of trips that they make every year to the watersports area, costs associated with the loss of this area are unknown. If this information were available, we could estimate the impact of lost or diminished skiing days given the value of a waterskiing day published in the literature. One study by Bergstrom and Cordell (1991, p.67) suggested the lost surplus value may be \$ 46.75 /day (adjusted to reflect 2002 monetary values) for a day of waterskiing. They applied a multi-community, multisite travel cost model to estimate demand equations for 37 outdoor recreational activities and trip values, including waterskiing. The analysis was based on nationwide data from the Public Area Recreational Visitors Study collected between 1985 and 1987 and several secondary sources.

Thomas and Stratis (2002, pgs. 30-32) evaluated the effect that reductions in the number of available boating destinations had on recreational boaters in Lee County. Reduced boat speeds at certain sites precluded high-speed activities historically associated with these sites, reducing the number of high-speed destinations available to these boaters. Thomas and Stratis demonstrated that some redistribution of boating trips did subsequently occur and concluded that the reduction in boating destinations resulted in an annual estimated loss per boater of \$423.94 in 1996 dollars (or \$597.97 when adjusted to reflect 2011 dollar values). The study was conducted in Lee County, not Citrus County, in 1996, and specific locations and 1996 values localize and date the results.

While studies demonstrate that recreationists can experience a change in the quality of their waterborne experience when speeds are restricted in historically high-speed boater destinations, not enough data are available to estimate any losses in economic value that the recreationists who use Kings Bay are likely to experience. However, given that this type of recreation will be allowed to continue in a posted area in Kings Bay from June 1 through August 15 and alternative sites are regionally available, economic impacts are not expected to be significant.

Recreationists who transit the designated, summertime slow-speed area would likely experience a diminished quality of the boating experience due to the additional time needed to transit this area at speeds slower than those historically present. These recreationists likely include anglers traveling to downstream fishing sites, and the additional transit times could affect the time that they have available to fish, or require them to leave earlier than they would normally, thus potentially reducing the quality of the experience. Lost fishing time could result in catch losses, thereby diminishing the fishing experience. The number of these recreationists and the number of trips that they make is unknown. However, because the area under consideration is relatively small, increased transit times may increase as much as 10 to 15

minutes one way. As a result, the economic cost of this alternative on these individuals cannot be quantified, but are likely to be minimal to insignificant.

Affected Commercial Charter Boat Activities: Various types of charter boats use Citrus County waterways for nature tours and other activities. The number of charter boats using Kings Bay is unknown, and information on their origins and destinations is lacking. However, many charter boats are used by renters to view manatees, an activity that occurs within the manatee refuge area. A manatee refuge designation is unlikely to cause a significant adverse impact to businesses that provide boats for manatee viewing and may even benefit them. Enhanced manatee protection measures should improve the viewing experience and are likely to positively affect this industry. The extra time required for commercial charter boats used for fishing to reach fishing grounds could reduce onsite fishing time and could result in fewer trips. Added travel time may affect the length of a trip, which could result in fewer trips overall. However, because the area under consideration is relatively small, increased transit times may increase as much as 10 to 15 minutes one way. The economic cost of this rulemaking on these activities cannot be quantified, but are likely to be minimal to insignificant.

Affected Commercial Fishing Activities: Local commercial fishers may experience some impact due to the regulation. To the extent that the regulation establishes additional speed zones in commercial fishing areas, this may increase transit times associated with the fishing activity, affecting the efficiency of commercial fishing. Costs associated with requirements for the use of manatee-safe float lines could increase some fishing gear costs, though the changes incorporated into this alternative should minimize this potential.

Crab boats would have to travel at slower speeds in some locations between crab pots, thereby potentially reducing the number of crabs landed on a daily basis. The speed limits may also slow transit speeds between fishing grounds for both crab and mullet fishing boats. The number of fishing boats operating and the amount of blue crab and mullet landings occurring in areas that would be newly designated speed zones under this rule are unknown. Given this, the impact on the commercial fishing industry cannot be quantified.

Crabbers fishing within the Kings Bay Manatee Refuge may need to modify their gear to ensure that manatees do not become entangled in crab pot float lines. The use of stiffened lines, including lines that incorporate stiffeners (wire, lines enclosed in hose or PVC, etc.), crab pot lines to reduce the number of float lines used (where crab pots are strung together and single float lines are used to locate the beginning and end of such a crab pot line), and other methods would increase gear costs. The number of crabbers fishing in Kings Bay is unknown. While many commercial crabbers check their traps every one to three days, the number of crabbers attending their crab pots less frequently than every 72 hours is unknown. Thus the extent to which this would impact these users, if at all, cannot be quantified but is likely to be minimal to insignificant.

This alternative is likely to affect commercial fishermen by way of added travel time, which may have an economic impact. However, because added travel times are unlikely to exceed an additional 30 minutes beyond existing travel times, it is unlikely that the alternative would result in a significant, if any, measurable economic impact on the commercial fishing industry.

Agency Administrative Costs: Agency administrative costs would include costs associated with signposting, enforcement, and some costs for education and outreach to inform the public about new designations within the manatee refuge. A manatee refuge would require nominal, additional signposting activities; however, the number and location of new signs needed to post the manatee refuge is not known. Some existing signs may be removed and reused. Additional law enforcement and education and outreach needs are also anticipated. Associated administrative costs are unknown.

The designation of a manatee refuge, as described by this alternative, will affect less than 530 acres of the State of Florida's 7.5 million acres of waterways and will add restrictions to an already-restricted area to better protect manatees. As a result, this alternative would impact the quality of waterborne activity experiences for some recreationists and may lead some recreationists to forgo certain waterborne activities. While this alternative would prohibit certain activities within the manatee refuge area, it does not prohibit recreationists from participating in similar activities elsewhere. Alternative sites are available for all waterborne activities that may be affected by this rule. The inconvenience of having to go slower or choose alternative sites for certain waterborne activities would likely have a regional economic cost. While the level of economic benefits that may be attributable to the manatee refuge is unknown (including benefits associated with manatee viewing), these benefits would likely minimize any economic impacts that may be associated with this alternative. Given available information, the net economic impact of designating this manatee refuge is not expected to exceed \$100 million per year.

Recreation and Public Access

This alternative would modify recreational activities and current waterway access practices in Kings Bay due to changes in boat speed and access limitations. These limitations would impact the quality of waterborne activity experiences for some recreationists and may lead some recreationists to forgo certain waterborne activities. While the alternative would prohibit certain activities within the manatee refuge area, it would not prohibit recreationists from participating in similar activities elsewhere. Alternative sites are available for all waterborne activities that may be affected by this rule.

2.2.6.2 Impacts to Biological Environment

The current condition of Kings Bay's biological environment attributes, including water quality, vegetative communities and wildlife habitat, would not experience any change under the no action alternative.

While less protective of manatees than Alternative B, the modification to continue to allow some level of high speed recreation in Kings Bay coincides with the period of least manatee use based on available occurrence data (Crystal River NWR 2011, unpublished data). The area north of Buzzard Island provides the most open space available for watercraft operation in Kings Bay and is of less value to manatees for feeding, breeding, and sheltering. The waters to the east, west, and south of Buzzard Island that will become a of the year-round slow speed zone generally have a greater density of manatee occurrences during the summer months, are

shallower, and contain more submerged aquatic vegetation than the waters to the north of the island. Adoption of this alternative would minimize the take of manatees through harassment, injury, or death as a result of waterborne activities. Additionally, this alternative would allow greater management flexibility to minimize human disturbance in a sensitive manatee wintering area.

Summary – Alternative F

The purpose of creating a manatee refuge under Subpart J is to “prevent the take of one or more manatees.” Alternative F, therefore, would meet the purpose and need of the proposed action to minimize the take of manatees by otherwise lawful activities in Kings Bay and minimize human disturbance in a sensitive manatee wintering (sheltering) area. Additionally, we recognize that this alternative would increase human safety in Kings Bay by not allowing watercraft to operate above slow speed to the east, west, and south of Buzzard Island. In comparison with Alternative B, this alternative is not likely to exacerbate human safety concerns in waters adjacent to the manatee refuge.

2.3 Summary of Environmental Consequences by Alternative

Table 4 provides a summary of the environmental consequences for each alternative described in this section.

Table 4. Summary of environmental consequences

| <i>IMPACT</i> | <i>RESOURCE CATEGORY</i> | <i>Alternative A</i> | <i>Alternative B</i> | <i>Alternative C</i> | <i>Alternative D</i> | <i>Alternative E</i> | <i>Alternative F</i> |
|-------------------------------|--|---|--|---|---|---|--|
| <i>Human Environment</i> | <i>Human Safety</i> | This alternative would not change existing human safety conditions. | This alternative would increase human safety in Kings Bay, but is likely to decrease human safety in adjacent waters. | This alternative would not change existing human safety conditions. | This alternative would not change existing human safety conditions. | This alternative would not change existing human safety conditions. | This alternative would increase human safety in Kings Bay, and is not likely to decrease human safety in adjacent waters. |
| | <i>Socioeconomic conditions</i> | This alternative will not change existing socioeconomic conditions | No effect on community services or community cohesion. No measurable detrimental effects are anticipated in regards to communities or individuals. No disproportionate adverse effects on low-income or minority populations. | No effect on community services or community cohesion. No measurable detrimental effects are anticipated in regards to communities or individuals. No disproportionate adverse effects on low-income or minority populations. | No effect on community services or community cohesion. No measurable detrimental effects are anticipated in regards to communities or individuals. No disproportionate adverse effects on low-income or minority populations. | No effect on community services or community cohesion. No measurable detrimental effects are anticipated in regards to communities or individuals. No disproportionate adverse effects on low-income or minority populations. | No effect on community services or community cohesion. No measurable detrimental effects are anticipated in regards to communities or individuals. No disproportionate adverse effects on low-income or minority populations. |
| | <i>Recreation and public access</i> | This alternative will not change existing recreation and public access conditions | Would modify kinds of recreational activities occurring in Kings Bay due to changes in boat speed and access limitations. Would modify current waterway access practices. | Would modify kinds of recreational activities occurring in Kings Bay due to changes in boat speed and access limitations. Would modify current waterway access practices. | Would likely modify recreational practices occurring in Kings Bay. | This alternative will not change existing recreation and public access conditions. | Would modify kinds of recreational activities occurring in Kings Bay due to changes in boat speed and access limitations. Would modify current waterway access practices. |
| <i>Biological Environment</i> | <i>Wildlife (not including listed species)</i> | This alternative will not change existing wildlife or habitat beyond existing conditions. | This alternative will not change existing wildlife or habitat beyond existing conditions. | This alternative will not change existing wildlife or habitat beyond existing conditions. | This alternative will not change existing wildlife or habitat beyond existing conditions. | This alternative will not change existing wildlife or habitat beyond existing conditions. | This alternative will not change existing wildlife or habitat beyond existing conditions. |
| | <i>Vegetation</i> | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species | This alternative will not change existing vegetation or habitat beyond existing conditions This alternative will not affect distribution, abundance, or trends in populations of exotic plant species |
| | <i>Water quality</i> | This alternative will not change current water quality. | This alternative will not change current water quality. | This alternative will not change current water quality. | This alternative will not change current water quality. | This alternative will not change current water quality. | This alternative will not change current water quality. |
| | <i>Endangered and Threatened Species</i> | Would perpetuate increasing number of manatees taken in the area. This alternative will not affect other Federal candidate, proposed, or listed animal species or critical habitat beyond existing conditions. | Would minimize the take of manatees and allow greater management flexibility for sensitive winter habitat. This alternative will not affect other Federal candidate, proposed, or listed animal species or critical habitat beyond existing conditions. | Would temporarily reduce the number of manatees taken in the area. | May affect the number of manatee takings that occur, but unlikely due to difficulty of enforcement. | May reduce the number of manatees taken each year but would not improve all of the measures that are needed to substantially reduce the number of manatees taken each year. | Would minimize the take of manatees and allow greater management flexibility for sensitive winter habitat. This alternative will not affect other Federal candidate, proposed, or listed animal species or critical habitat beyond existing conditions. |

- Alternative A: No Action
- Alternative B: Designate a Kings Bay Manatee Refuge
- Alternative C: Modify existing network of manatee protection areas
- Alternative D: Promulgate harassment regulations
- Alternative E: Increase/enhance law enforcement
- Alternative F: Modified Alternative B - Designate a Kings Bay Manatee Refuge

2.4 Cumulative Effects

NEPA defines “cumulative impacts” as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7).

Suggestions to the effect that manatee populations may be increasing in the face of past actions by Federal, State, and local governments are encouraging. Based on the 5-year review conducted by the Service in 2007 (USFWS 2007), the best available science shows the overall population of the Florida Manatee has increased and the Antillean manatee population in Puerto Rico is stable; neither subspecies is currently in danger of becoming extinct within all or a significant portion of their range. However, rulemaking procedures to reclassify the manatee from endangered to threatened have not yet begun. Additionally, threats to the species, including human-related mortality, injury, and harassment, and habitat alteration, continue and require ongoing and additional actions (such as the preferred alternative) to further the manatee’s status to the point at which it no longer requires protection under the ESA. Pursuant to our mission, we continue to assess this information with the goal of meeting our manatee recovery objectives.

Possible future actions associated with the preferred alternative include enhanced law enforcement and the possible realignment of existing manatee sanctuaries and temporary no-entry areas within the boundaries of the manatee refuge, if the need becomes apparent. For example, altered weather or water conditions may cause changes in current manatee use patterns. Such actions are consistent with our goal of recovering the Florida manatee so that the species no longer requires the protection of the ESA and it can be removed from the Federal list of endangered and threatened species.

Observations by law enforcement officers and manatee researchers imply that “take” of manatees and human-related manatee mortalities are reduced in areas designated as refuges or sanctuaries. This indicates that, on a site-specific basis, previous actions to protect the manatee have been successful. However, areas outside of existing manatee refuges and sanctuaries continue to experience human-related manatee injuries and mortalities. The designation of additional manatee refuges and sanctuaries in areas heavily used by manatee and humans alike is expected to prevent take of manatees in these areas and will enhance public awareness of the measures necessary to protect the manatee. The cumulative impact of designating additional manatee refuges and sanctuaries on the public has also been assessed. Impacts such as loss of recreational areas, increase in travel time, and general inconvenience that many boaters may experience due to these manatee refuges and sanctuaries will generally be limited to small areas within their overall travel area.

2.5 Mitigation Measures

Mitigation measures are measures prescribed to avoid, reduce, or compensate for the adverse effects of an action on natural, cultural, and socioeconomic resources. If the preferred action (Alternative F) is selected, the Service believes that there will be negligible effects to

these resources. More specifically, adoption of this alternative should not result in changes to non-manatee wildlife, on-site vegetation, water and air quality, noise levels, and cultural and socioeconomic resources.

Chapter 3: Public Involvement

The Service's North Florida Ecological Services Office has discussed concerns and possible solutions needed to address manatee harassment and other takings occurring in Kings Bay, Florida with many of its stakeholders over the past several years. Manatee harassment concerns and concerns related to the take of manatees by watercraft collision in Kings Bay have been the focus of numerous discussions. These discussions have addressed Federal and State "harassment" regulations, education and outreach materials designed to minimize harassment, enforcement efforts to address harassment, and other relevant topics. These discussions occurred in the context of the Florida Manatee Recovery Team's Manatee Protection Working Group meetings, Crystal River NWR permit holder and public meetings, and at Commission meetings held in Crystal River. A significant level of public involvement in agency scoping activities regarding the take of manatees in Kings Bay had been occurring prior to the publication of the proposed rule on June 22, 2011 (76 FR 36493), to establish a manatee refuge in Kings Bay.

In the June 22, 2011, proposed rule, we requested comments concerning any aspect of the proposal and the accompanying draft EA that might contribute to development of the final decision on the proposed rule. A 60-day comment period was provided. We sent notifications and other informational materials about the project to Federal and State agencies, Congressional representatives, conservation groups, local governments, local commercial diving operations, and numerous private citizens who may be affected or had expressed an interest in receiving further information on the project. In accordance with our policy on peer review, published on July 1, 1994 (59 FR 34270), we also provided copies of this proposed rule to three appropriate independent peer reviewers.

We published a legal notice in the Citrus County Chronicle newspaper on June 24, 2011, announcing the proposal and availability of the draft EA, inviting public comment on both, and announcing the schedule for the informal open house and formal public hearing. Informational flyers were also distributed by the Crystal River NWR staff and friends group to all waterfront properties adjoining Kings Bay, as well as other near-by residences, and copies were mailed to the NWR's Comprehensive Conservation Plan development stakeholder and interested party list.

We held a public informational open house and formal public hearing at the College of Central Florida-Citrus Campus, CF Conference Center in Lecanto, Florida, on July 7, 2011. The public hearing was attended by 169 people, not including Service staff. Of the 49 hearing attendees who signed up to speak, 42 provided oral comments (including 15 local officials).

During the comment period, we received 415 written comments and 42 oral comments. A number of written commenters attached supporting documents such as petitions with multiple signatures or member form letters. Overall, comments came from individuals, conservation organizations, property owners, dive shop owners, tour operators, business owners, local officials, and other Stakeholders. The majority of the comments expressed support for or

opposition to the proposed manatee refuge without any substantive data or information provided for Service consideration.

Those expressing support generally either supported the rule as proposed, with some minor modifications and suggestions for improving education, or expressed concerns it was not extensive enough. Those expressing opposition cited a broad range of concerns including riparian property rights, lack of alternatives considered, perception that the public was not involved earlier in the process, recreational user safety, and perceived economic effects. In some cases those in opposition generally supported most of the winter aspects of the rule but not the year-round watercraft restrictions.

Additionally, in accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from three knowledgeable individuals with expertise in various aspects of the rule. We received responses from two of the peer reviewers. The peer reviewers generally concurred with our proposal and its content. One provided an additional economic reference, which was incorporated into the rule. Another recommended protection of an additional spring (Hunter Spring) but did not provide accompanying justification. The Service does not have sufficient information to justify its inclusion at this time.

This final EA and the formulation of Alternative F incorporates edits, clarifications, and modifications based on comments received through public and peer review, as relevant and appropriate. All comments submitted during the public comment period can be viewed at <http://www.regulations.gov> (in the “Enter Keyword or ID” box, enter FWS-R4-ES-2010-0079). The final rule implementing Alternative F, to be published concurrently with the availability of this final EA, includes a “Public Comment” section that compiles substantive comments received and Service’s response to those comments. The final rule can also be viewed from the website and Keyword/ID provided above. The North Florida Ecological Service Office will also provide a link to the final rule (<http://www.fws.gov/northflorida/>).

Chapter 4: Conclusion

After a thorough analysis of all of the alternatives developed along with consideration of the public input received during the public involvement process, the Service has determined that Alternative F satisfies the purpose and need of the proposed action and is practicable and feasible to accomplish our goal. In an attempt to balance the human use of Kings Bay and the associated resources, the Service has consider all of the affected environment as we pursue our mission to protect fish, wildlife, plants, and their habitats for the benefit of the American people.

Chapter 5: Literature Cited

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