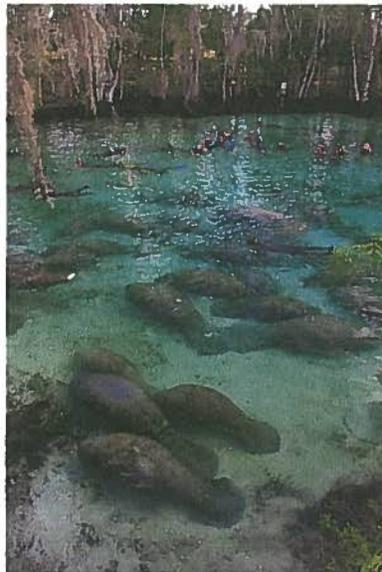


**Final Environmental Assessment**

**Manatee Wildlife Viewing**

on

**CRYSTAL RIVER NATIONAL WILDLIFE REFUGE  
THREE SISTERS SPRINGS  
Citrus County, Florida**



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This Final Environmental Assessment (EA) addresses a recreational wildlife viewing activity where large numbers of snorkelers and boaters are crowded into a relatively small aquatic space to view a protected species, the Florida manatee (*Trichechus manatus latirostris*). This activity is occurring in shallow, warm water springs (1.5 acres), known as Three Sisters Springs, which is situated on a larger property (57.1 acres) also known as Three Sisters Springs. For the purpose of this EA, we are only addressing the recreational viewing activity which occurs in the confined 1.5 acres of fresh water springs.

## **BACKGROUND**

The 57.1-acre Three Sisters Springs property (Figure 1) was purchased through a partnership effort in July 2010 (Figure 1). This partnership included: the City of Crystal River (City); the Florida Communities Trust (FCT) [grant to the City]; Citrus County and the Citrus County Tourist Development Council; the Felburn Foundation, the Friends of Crystal River National Wildlife Refuge Complex, environmental organizations, civic clubs, and individuals; Southwest Florida Water Management District (SWFWMD); National Wildlife Refuge Association; and the U.S. Fish and Wildlife Service (Service or USFWS). Federal Land and Water Conservation Fund and Felburn Foundation funds were used to retire the water rights for the warm water springs located on the site by purchasing a privately held Consumptive Use Permit.

The 57.1-acre property is 70% owned by the City and 30% by the SWFWMD. The Crystal River National Wildlife Refuge (Crystal River NWR), the City and the SWFWMD manage this property pursuant to the Three Sisters Springs Management Agreement (Agreement) and Management Plan (Plan). (Appendix A and B). The Service manages the property under a lease agreement with the City and SWFWMD. This Agreement lasts for 25 years and allows for two automatic 25-year extensions. The Agreement provides for the Service to manage the entire site as part of Crystal River NWR in accordance with (1) the Plan; (2) the National Wildlife Refuge Administration Act of 1966, as amended, 16 U.S.C. § 668dd; (3) other acts of general applicability to the National Wildlife Refuge System; (4) Title 50 of the Code of Federal Regulations (including the Kings Bay Manatee Protection Area Rule); and (5) State of Florida laws and regulations. The Agreement between the City and Crystal River NWR describe a broad range of public use requirements.

As provided in the National Wildlife Refuge Administration Act, the Service's policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management, ensuring that such uses receive enhanced attention during planning and management. Wildlife observation is a priority wildlife-dependent use for the National Wildlife Refuge System (NWRS) through which the public can develop an appreciation for fish and wildlife (Executive Order 12996, March 25, 1996 and The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57)). The Agreement requires the Service to maintain Three Sisters Springs, including the warm water springs, open to public recreation, maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees. (For an overview of the environmental and regulatory issues surrounding manatee management in the Kings Bay vicinity).

see: [http://www.fws.gov/northflorida/Manatee/Documents/MPARules/Mar12\\_KB\\_MPA/20111202\\_ea\\_FINAL\\_EA%20Kings\\_Bay\\_MPA.pdf](http://www.fws.gov/northflorida/Manatee/Documents/MPARules/Mar12_KB_MPA/20111202_ea_FINAL_EA%20Kings_Bay_MPA.pdf).

Figure 1. 2009 Aerial Photo of Three Sisters Springs Property with Springs Assessment Area.



## **CHAPTER 1 Purpose and Need for Action**

Crystal River NWR was administratively authorized by the Director of the Service on January 10, 1983, to conserve threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the subspecies Florida manatee (*Trichechus manatus latirostris*). The primary purpose of Crystal River NWR is to protect threatened and endangered species, with a management focus on the Florida manatee, under the Endangered Species Act:

... to conserve (A) fish or wildlife which are listed as endangered species or threatened species .... or (B) plants ...” 16 USC §1534 (Endangered Species Act of 1973).

Secondary purposes also apply to Crystal River NWR, as listed:

... suitable for...(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...” 16 USC §460k-1 “... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ...” 16 USC §460k-2 (Refuge Recreation Act, 16 USC §§460k-460k-4, as amended).

... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions...” 16 USC §3901 (B) 100 Stat.3583 (Emergency Wetlands Resources Act of 1986).

Specifically, Crystal River NWR was established for the protection of the endangered West Indian manatee. The objectives for Crystal River NWR include:

1. To provide habitat and protection for the West Indian manatee consistent with the requirements of the Endangered Species Act, the Marine Mammal Protection Act, and the Florida Manatee Sanctuary Act.
2. To foster a sense of public commitment and understanding toward the plight of the manatee and its need for protection by providing opportunities for environmental education, interpretation, and compatible wildlife-oriented recreation.
3. To support the Service's commitment to implement and carry out the objectives of the nationwide Manatee Recovery Plan.
4. To provide habitat for a natural diversity of wildlife species.

The purpose of this Final Environmental Assessment (EA) is to evaluate alternatives for managing human and manatee interactions in the 1.5 acres of warm water springs located on Three Sisters Springs, given the requirements of the Agreements and Plan with the City and District, as well as the Crystal River NWR purposes summarized above. The warm water springs consist of three spring heads/boils named Pretty Sister, Big Sister, and Little Sister in which the site derives its name (Figure 2).

With the trend of increasing human and manatee usage inside the three spring heads, there is a need to evaluate human and manatee interactions in this limited and specific assessment area to better inform management actions in the future. Recommendations for changes to manage human and manatee interactions will only apply to the three spring heads located at Three Sisters Springs.

### **Public Outreach**

A description of the Crystal River NWR's long-term management actions and direction is being developed in the Crystal River NWR Comprehensive Conservation Plan (CCP) scheduled for completion in 2015. However, this EA for manatee wildlife viewing is being developed only to implement management measures/strategies to address concerns associated with increased manatee use and human crowding inside the 1.5 acres of warm water springs consisting of Pretty Sister, Big Sister, and Little Sister springs for the 2014-2015 manatee season. These interim measures (proposed action) will be evaluated, monitored, and adapted to assist in final management actions implemented under the CCP that is under development.

The alternatives and the scope of the affected environment for this EA have been informed by previous public comments and meetings for the CCP which included public meetings on February 6, 2008; November 16, 18, and 20, 2010; December 2, 2010; January 4, 2011; July 7, 2011; March 19, 2013; and July 11, 2013. For the 14-day public review of this EA, Crystal River NWR provided a short summary of the proposal, informed the public how and where to get the entire EA, and provided a 14-day comment period ending January 2, 2015. Details about the comment period and how to respond were provided to the public and stakeholders through emails, websites, public notices, and postings at the Crystal River NWR visitor center. The Final EA will be available at the Crystal River NWR visitor center, on the Crystal River NWR website ([www.fws.gov/crystalriver](http://www.fws.gov/crystalriver)), and at the public library. The reduced public comment period was allowed because of the extensive public scoping provided and the urgent need to address manatee protection during the current winter season.

Crystal River NWR reviewed all comments submitted in the preparation of the final EA (See Response to Public Comments). As a caveat the Crystal River NWR will continue with implementing necessary cold-weather closures outside of review and response to public comments, and the finalization of the EA.

### **Consultation and Coordination**

Crystal River NWR staff consulted with the USFWS's Ecological Services program in the North Florida Ecological Services Office for the Intra-Service Section 7 Consultation under the Endangered Species Act. This consultation resulted in a "not likely to adversely affect" determination (Appendix C). Additionally, between March 2014 and October 2014, Crystal River NWR informally consulted with the City, District, Florida Fish and Wildlife Conservation Commission (FWC), USGS manatee researchers, local stakeholders, interested parties, community groups, and national and local non-government organizations.

Figure 2. Three Sisters Springs Assessment Area.



## **Chapter 2 Alternatives Including the Proposed Action**

### **2.1 Alternatives Considered but not Developed Further**

Close the 1.5 acres of warm water springs located on Three Sisters Springs during the Manatee Season.

Under this alternative, the Crystal River NWR would close the three spring heads located on Three Sisters Springs to all public access during the manatee season (November 15 – March 31) until the CCP and associated Environmental Assessment are completed. However, this alternative would violate the Agreement and the Plan in accordance with the Declaration of Restrictive Covenants which precludes a complete closure of Three Sisters Springs.

### **2.2 Alternatives Considered and Developed**

Two alternatives were considered and developed for this EA: (1) the No Action Alternative and (2) the Proposed Action Alternative (preferred alternative), which considers the parameters required by the Agreement and Plan in accordance with the Declaration of Restrictive Covenants (Appendix A and B) and provides protection for manatees as stated below:

**Manatee Management:** The Three Sisters Springs will remain open to the public to be used for kayaking/canoeing, swimming, snorkeling and diving, subject to any restrictions that may be implemented through the provisions of the Agreement in place for the Three Sisters Springs site. In keeping with the intent of maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees, the Service will consider using existing federal rulemaking/processes to manage for the benefit of both manatees and visitors.

**Public Uses:** The public currently accesses the Three Sisters Springs by water, entering the springs while in the water or by kayak/canoe, primarily to view manatees. No motorized crafts, such as motorboats, jet skis, etc., will be allowed in the springs or the spring run. Management activities will include providing compatible, wildlife-oriented recreational opportunities for visitors while optimizing use of the springs for manatees. Compatible uses of the site will likely include existing in-water uses, managed to enhance visitor experiences and minimize manatee disturbance. The Service may enact partial closure of Three Sisters Springs during the coldest winter months and would consider full closure only for extreme cold winter events. Management actions concerning the protection of manatees in the springs and adjacent areas will be made with input from the public as provided for by federal law.

In addition, both alternatives must consider the guidelines for passive wildlife observation, including the 12 prohibited actions identified in the Kings Bay Manatee Protection Area Rule (Appendix D).

### **2.2.1 Alternative 1 (No Action): Current Management**

Under this alternative, the Crystal River NWR would not implement any management measures under the National Wildlife Refuge Administration Act in the warm water springs located at Three Sisters Springs except for those measures identified in the Kings Bay Manatee Protection Area Rule for extreme cold weather events and violations of the 12 prohibitions and in the Agreement and Plan (Appendix A and B).

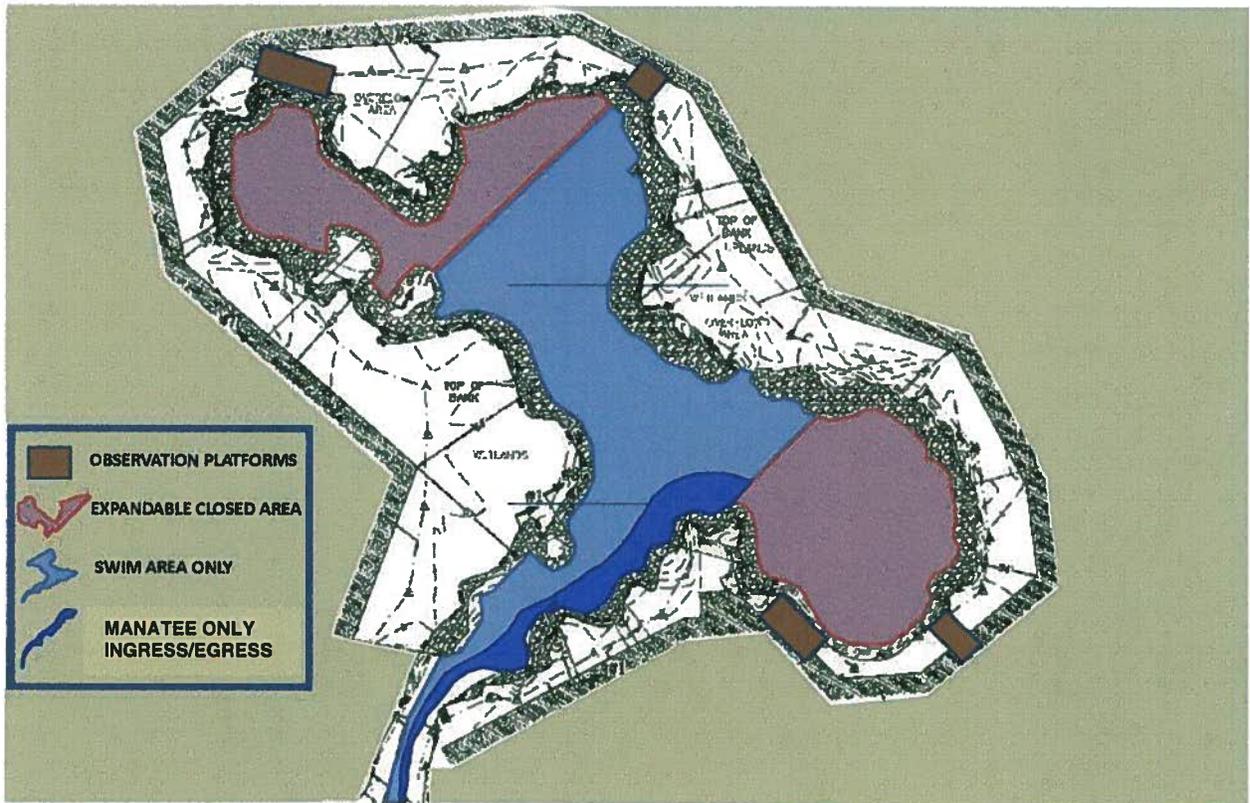
### **2.2.2 Alternative 2 (Proposed Action): Create interior areas for manatees only, restrict in-water public visitation, and restrict non-motorized vessels at the warm water springs located at Three Sisters Springs during Manatee Season (Figure 3)**

The proposed action would allow the Service to implement the following precautionary measures under the National Wildlife Refuge Administration Act for the 2014 – 2015 manatee season and will allow the Service the ability to avert the disturbance of manatees associated with watercraft and manatee viewing activities.

1. Continue to implement temporary full closures to prohibit visitation inside the warm water springs located at Three Sisters Springs during extreme cold weather events and violations of the 12 prohibitions identified by the Kings Bay Manatee Protection Area Rule.
2. Install an in-water, non-motorized vessel tie-up/disembarking area east of the warm water springs located at Three Sisters Springs, and allow management flexibility to prohibit vessels and large inflatable floats within the spring heads as well as the spring run in order to prevent manatee disturbance and potentially unsafe encounters with swimmers. Refuge staff and volunteers may use non-motorized vessels inside Three Sisters Springs to monitor human-manatee interactions. In-water access by non-motorized vessel for mobility-impaired individuals to Three Sisters Springs during manatee season will be provided through special use permit only.
3. Guide the public to use the western half of the spring run extending into the warm water spring heads located at Three Sisters Spring to maintain an open channel for manatee ingress and egress.
4. Create two expanded no-public entry areas within the spring heads by closing the eastern and western lobes known as Pretty Sister and Little Sister located on Three Sisters Springs.
5. Require a Special Use Permit for the use of any type of flash photography inside the warm water springs at Three Sisters Springs. Special Use Permits for diffused flash photography will only be issued for educational or research purposes. Permits by the Service's Management Authority will be recognized by Crystal River NWR for use of flash photography if photographers are a minimum of 20 feet from all manatees.
6. Amend Special Use Permit conditions for Commercial Wildlife Observation Guides using the warm water springs at Three Sisters Spring to require the following specific stipulations: a City of Crystal River business license or exemption letter, in-water insurance for their clients, and an in-water guide to accompany the clients into the Three Sisters Springs.

7. Implement an expedited communication plan to actively inform visitors and stakeholders of the proposed action.

Figure 3. Potential Management Options for the 2014-2015 Manatee Season (Proposed Action Alternative).



## **Chapter 3 Affected Environment**

Three Sisters Springs (57.1 acres) is located within the City of Crystal River, Citrus County, Florida, at the eastern edge of Kings Bay and the headwaters of the Crystal River. It is bounded to the north by Kings Bay Drive, to the east by Cutler Spur Boulevard, and to the south and west by dredged navigational canals. The affected environment consists of the three small, second-order magnitude warm water springs located in the southwest corner of the property (Figures 1 and 2) (Appendix G).

Prior to extensive development in and around the City, the site consisted of a forested wetland system that surrounded Three Sisters Springs (Figure 4). The 1957 aerial photograph shows that the forested area within the site extended further to the south than it does presently. By 1973, a residential canal was excavated that forms the present southern boundary of the project site. Between 1973 and 1985, much of the site was cleared of native vegetation and a large borrow pond (Lake Lynda) was excavated to obtain fill material needed to raise ground elevations for future development. A residential development was planned and permitted for construction in 2008, but the property owners ultimately agreed to sell the parcel to a consortium of public agencies for environmental purposes.

Currently, the site is comprised of open space with scattered trees. A hardwood fringe surrounds the perimeter of the parcel as well as provides a buffer around the warm water spring heads or boils and run. Much of the open area has been prepared for reforestation. The Crystal River NWR recently completed a boardwalk to provide walking access around the warm water springs located at Three Sisters Springs.

The contributing watershed sub-basin totals about 140 acres. The dominant land use in the watershed is commercial and makes up about 59 percent of the total area. About 20 acres of the site contributes runoff to the eastern drainage ditch. Two aquatic features exist on Three Sisters Springs, the natural warm water springs that occurs in the southwest corner of the site, and an excavated borrow pond locally named Lake Lynda in the northern part of the site. The lake has a surface area of approximately eight acres and has a maximum depth of about 40 feet. Man-made storm water ditches lie adjacent to the northern and eastern boundaries of the site and large navigable canals bound the southern and western property lines.

### **3.1 Biological Environment**

The warm water springs located at Three Sisters Springs have been classified by State of Florida as a second-order spring system with three primary spring boils with interconnected pools. The warm water spring heads are situated in an entirely confined area. The three spring heads and interconnected pools are less than 1.5 acres in size, have an average depth of 6 feet, and are completely surrounded by a vegetated shoreline. It has a narrow, 8-foot wide, 165-foot long water outfall or spring run. The spring run discharges into a dredged, residential canal system with leads into Kings Bay and eventually to the Crystal River which flows into the Gulf of Mexico. The springs located at Three Sisters Springs are collectively one of only a few confined spring sites where people are allowed to swim with manatees during the winter months.

All confined springs under State-ownership in Florida are closed to public access during the winter when manatees are present.

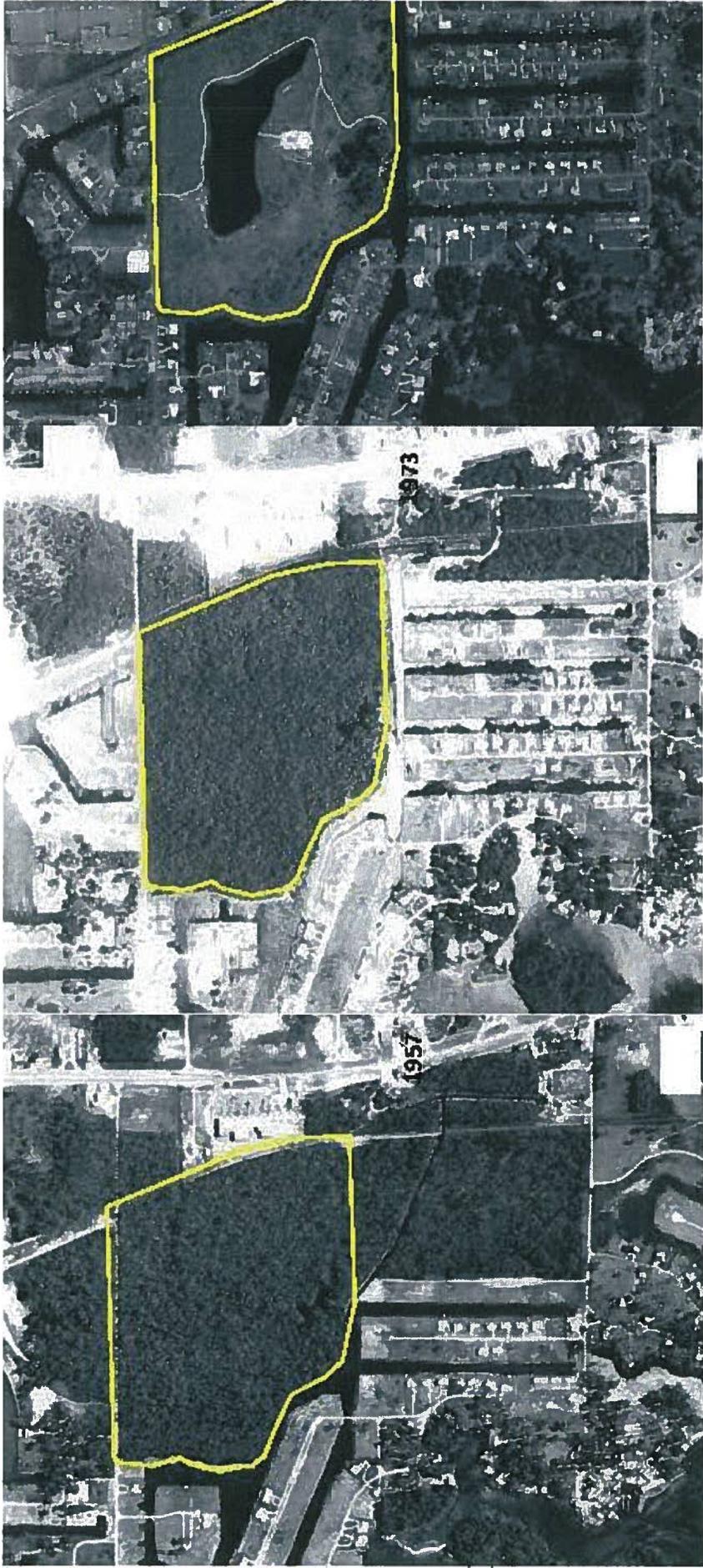
Existing and historical overviews of the Three Sisters Springs spring shed, geology and soils, land use and land cover, general hydrology, vegetation and natural communities, and importance to Florida manatees are described in the Three Sisters Springs Project Management Plan (FCT 2010).

### **3.1.1 Hydrology**

The principle hydrogeological feature of the property is the Upper Floridian Aquifer with limestone karst commonly located near the surface of the soil (USDA-SCS 1988). Overlaying soils are moderately sloping and somewhat poorly drained, consisting of sand, silt, and clay (USDA-SCS 1988). The site was historically part of a densely vegetated, extensive wetland system draining to Kings Bay of the Crystal River (FCT 2010). Given the nature of the hydrogeology, soils, and vegetation patterns, it is believed that this property was historically either a Mesic or Hydric Hammock natural community (FCT 2010 see FNAI 2010 for description). Aerial photography suggests that it remained in this condition until the 1970s, when the property was cleared and filled with the intent of creating a building site suitable for residential development. During this time at least two borrow pits were excavated: one approximately four acres in size formerly located on the southwestern portion which was eventually filled, and another approximately eight acres and 40 feet deep located on the northern portion of the property called Lake Lynda.

Analysis of aerial and historical photography, current site conditions, and history of land use at the site suggest that the hydrology, hydraulics, and geomorphology have changed over time. Aerial photography from 1944 – 1974 indicates that Three Sisters Springs consisted of three narrowly connected spring boils with an extensive wooded riparian zone and associated wetlands until land use clearing and filling (Figure 4). The 1974 aerial shows extensive tree clearing at the site into the riparian zone of the spring, particularly along the southern portion of the pond and spring run where trees were cleared from the banks. The current riparian tree assemblage is relatively young (30 – 40 years), suggesting that tree clearing continued throughout the rest of the riparian zone as the land was filled, and prepared for residential development. In addition, the perimeter and surface areas of the spring boils appear noticeably smaller in the pre-construction aerials of 1944 and 1951 (with the 1974 aerial better showing the morphology due to tree clearing) than in the post-construction aerials 1994 – present.

Figure 4. Historical Aerial Photographs of Three Sisters Springs 1957, 1973, 1985, respectively. (SWFMD 2012).



### **3.1.2 Soils and Vegetation**

Soils on the Three Sisters Springs property have experienced significant disturbance in preparation for development. Lake Lynda in the center of the property was created through excavation to produce material to raise ground levels on the site. The watershed is dominated by Quartzipsamments soils which are located primarily in the developed area of the watershed east of the site. Soils underlying the project site are dominated by Matlacha soils which are disturbed soils produced from dredging and grading work. Limestone rock is prevalent on the site and obvious in many of the bedded pine rows. The bottoms of spring runs are generally sand or exposed limestone along a central, stable channel.

The perimeter of the warm water springs located at Three Sisters Springs is currently characterized by a narrow riparian zone 10–40 feet wide typically comprised of riparian trees (especially on the north and northeast perimeter) and sparse to moderately dense understory vegetation (Figure 2). The western portion (little sister) of the Three Sisters Springs has a wider riparian zone comprised of up to five trees per radial width. Site inspection identified what appear to be levees, fill material, and sporadic boulders located within the west-southwest riparian zone of the warm water springs at Three Sisters Springs. Banks along the pool and run are vertical to severely undercut, with bank angles up to 160° and undercuts reaching > 4 feet underneath some banks. Vegetation in the warm water springs at Three Sisters Springs and spring run habitats consists of submerged aquatic vegetation and aquatic algae covering limestone outcroppings. Several trees overhang the pool, in some cases with nearly entire root structure exposed with little or no connection to the pool banks.

### **3.1.3 Threatened, Endangered, and Protected Species**

#### **3.1.3.1 West Indian Manatee**

The West Indian manatee, including the Florida and Antillean subspecies, is listed as an endangered species pursuant to the Endangered Species Act of 1973 (USFWS 2007). The State of Florida lists the Florida subspecies as an endangered species pursuant to Rules 68A-27.003 and 68A-27.005 of the Florida Administrative Code (FWC 2011). The Service designated critical habitat for the Florida subspecies in 1976; this designation includes waters in Florida, including waters in Kings Bay (USFWS 2007). The Crystal River NWR has the responsibility to delineate the manatee sanctuary boundaries, provide volunteers to conduct education around the sanctuaries, and conduct law enforcement year-round in the Kings Bay Manatee Protection Area (KBMPA) and seven manatee sanctuaries in Kings Bay.

Florida's manatee population is primarily threatened by watercraft collisions and loss of winter warm water habitat. Other threats include red tides, cold weather, water control structures, fishing gear, and others. Significant efforts have been made by the Service and State to address these threats. In 2007, a USFWS threat analyses suggested that these efforts are improving the status of the Florida manatee (USFWS 2007). The Service is currently conducting a review of the status of the West Indian manatee (90-Day Finding on a Petition to Reclassify the West Indian Manatee and Initiation of a Status Review, 2014).

A significant habitat threat to the Florida manatee is the loss of warm water refugia at natural, warm-water springs and man-made warm water outflows from power plants. Natural springs across Florida are threatened by reductions in flow and water quality and by factors which affect manatee access and use. The 70 springs in Kings Bay constitute one of the most important natural warm water shelters for the Florida manatee. The Kings Bay springs provide refugia to hundreds of manatees during cold-weather conditions and are considered among the highest priority winter thermal retreats for the species throughout its range. Displacement of manatees from warm water springs is a cause for concern because prolonged exposure to cold water can be fatal, especially to smaller animals.

Winter manatee aggregations are driven by a single factor, cold weather. One of the greatest natural threats to manatees are the more extreme winter cold weather events that have caused mass mortalities of up to 480 manatees, such as in the winter of 2010. Most cold fronts that affect the Gulf of Mexico are mild, with air temperatures ranging from mid 50s to low 70s Fahrenheit (F). Prolonged cold events (over 24 hours) ranging from low 40s to mid 50s F, trigger high manatee aggregations in the warm water springs at Three Sisters Springs (water temperature 72° F), while events below 40° F trigger extreme manatee aggregations around the spring heads located at Three Sisters Springs. These last two ranges of cold fronts can occur frequently in November, December, January, February and March, with January having the most frequent and intense cold fronts. While some of the events do not last very long (2 -3 days), others can take about 2 weeks to move through Kings Bay. Because of the shallow depth of Kings Bay (average 8 feet), these stronger fronts can drop the water temperature significantly, leaving manatees with few warm water refugia. Another factor is successive cold spells within a short timeframe which reduce the water temperature significantly keeping manatees aggregated around the warm water springs including the spring heads located at Three Sisters Springs for days. More in depth weather information for this local area is located at: <http://climatecenter.fsu.edu/images/fcc/data/lcdtables/2014TPAjan.html>

Manatees have been surveyed by aerial observations in Kings Bay beginning in 1967 (Appendix E) and have shown a generally increasing population trend. Aerial surveys began in 1968 with a high count of 38 manatees in Kings Bay. Twenty years later in 1988, the population count totaled 158. In 2013, aerial surveys showed a peak of 560 manatees using Kings Bay (Kleen and Breland 2014). While aerial surveys are conducted over the Three Sisters Springs, dense canopy cover around the warm water springs does not allow for an accurate aerial survey count. However, aerial surveys over Idiot's Delight Number 1 manatee sanctuary, directly outside of the Three Sisters Springs, have recorded over 80 manatees. The same survey records over 80 manatees outside of Idiot's Delight Number 1 manatee sanctuary and Three Sisters Springs seeking warm water refugia. The photo does not reveal if the interior of Three Sisters Springs is already full of manatees, or if there are people present which may have displaced manatees.

Prior to 2010 and during low tides manatees were rarely found in the interior of the warm water springs located at Three Sisters Springs due to the presence of boulders partially blocking the spring run. Since the removal of this barrier, staff and manatee watch volunteers have reported manatees using the spring heads at Three Sisters Springs with greater frequency on low tide events. On January 5, 2014, Crystal River NWR staff implemented the first temporary cold weather closure of Three Sisters Springs. Nearly 300 manatees were observed using the warm

water springs at Three Sisters Springs during high tides, and over 100 manatees remained during low tides. During this event, air temperatures ranged from low 30s to low 50s for three days. The second closure of Three Sisters Springs warm water springs occurred from January 18 - 24, 2014, due to similar air temperatures and manatee numbers. A third closure occurred January 29 through February 1, 2014, with air temperatures ranging from the lower to upper 40s. Staff and volunteers observed hundreds of manatees seeking warm water in the interior of the warm water spring located at Three Sisters Springs during these cold weather temporary closure events.

### **3.1.3.2 Other Protected Species**

There are no known listed plants on the site, or other threatened or endangered species.

Five sea turtle species are found in Florida's marine and estuarine waters: green, hawksbill, Kemp's ridley, leatherback, and loggerhead. No sea turtles are known to use Three Sisters Springs. Eastern indigo snakes have not been reported on the Three Sisters Springs site. Gopher tortoises are not known to occur on terrestrial areas of the site.

Up to 23 wood storks use Parker Island each winter for roosting, especially on windy days, and they feed in and around Crystal River NWR waters. These birds utilize land around the Three Sisters Springs, but not the warm water springs themselves. Florida sandhill cranes are usually seen flying over with an occasional pair landing at the property or next to the Crystal River NWR Complex Headquarters. Six active bald eagle nests occur within five miles of the Crystal River NWR headquarters and the Three Sisters Springs (Florida Fish and Wildlife Conservation Commission 2013c).

Gulf or Atlantic sturgeon has been reported as close as the Lower Suwannee River, but not in Three Sisters Springs warm water springs.

## **3.2 Human Environment**

### **3.2.1 Wildlife-Dependent Recreation**

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the Service to manage the Crystal River NWR and its wildlife populations. In addition, it declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the National Wildlife Refuge System (NWRS) and are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. It directs managers to increase recreational opportunities on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the NWRS.

Manatee tourism to Kings Bay, recorded by Crystal River NWR since 2009, has shown a significant and steady increase. Public visitation to Kings Bay occurs by boating, paddling, swimming, fishing, snorkeling, and other in-water activities throughout the year. Businesses catering to recreation have developed into thriving commercial operations that have increased

considerably since the establishment of the Refuge in 1983. The Refuge only manages commercial use activities associated with manatee guided tours and photography for Refuge lands and waters in Kings Bay. Currently, the Refuge administers 44 Commercial Special Use Permits; 34 are snorkeling/scuba operators and 10 are guided/rental non-motorized vessel outfitters. These businesses must report visitation numbers monthly (Appendix E). Permitted visitation to the Refuge has increased yearly from over 67,000 in 2010 to over 125,000 in 2013. During the most critical months for manatees, November through March, Commercial Special Use Permit holders reported an average visitation per day of 360 clients to the warm water springs located at Three Sisters Springs and Kings Spring. In March 2014, Commercial Special Use Permit holders reported the highest visitation recorded in one month with 17,046 visitors to the Refuge including Three Sisters Springs and Kings Spring. Over the last four years during the peak manatee season, guided visitation has increased from 275 visitors per day to 421 visitors per day to both Refuge springs.

This trend is expected to continue with visitation anticipated to exceed 140,000 visitors to Kings Bay during this 2014 -2015 manatee season. This includes the Three Sisters Springs, House Spring, Jurassic Spring, Kings Spring, and other areas of Kings Bay.

#### **3.2.4 Socioeconomic Environment**

The site is located within the city limits of Crystal River, Florida. Although with just over 3,000 residents, the City is 2.25 times more densely populated than the County, 1.5 times more than the State, and 6.2 times more than the U.S. While the median household income in the City is comparable to the County, it is lower than State and national income averages. Per capita income is higher for the City than the County, but is lower than State and national figures. The City is predominantly white and older, with the median age in the City (55.4) comparable to the County and older by nearly 15 years over the State median age and by 18 years over the national median age. The primary employers for Citrus County are: (1) Educational Services and Health Care and Social Assistance (23.9%); (2) Retail Trade (16.2%); (3) Arts, Entertainment, and Recreation and Accommodation and Food Services (14.2%); (4) Professional, Scientific, and Management and Administrative and Waste Management (8%); (5) Construction (7.2%); (6) Transportation and Warehousing, and Utilities (7.1%); and (7) Public Administration (6.9%). Unemployment rates are generally lower for the City (6.7%) and higher for the County (14.8%) than for the State (13.3%) and the U.S. (10.8%). A large part of Citrus County's economy is dependent upon its retired population (U.S. Department of Commerce, U.S. Census Bureau 2012a, 2012b, 2012c, 2011a, and 2007).

## Chapter 4 Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the two management alternatives described in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as “impacts” or “effects.” When detailed information is not available, those comparisons are based on the professional judgment and experience of Crystal River NWR staff and Service biologists.

### 4.1 Summary of Effects

#### **4.1.1 Alternative 1 (No Action Alternative)**

##### *4.1.1.1 Impacts to Biological Environment*

The current condition of the biological environment attributes, including hydrology, and vegetative communities, would not experience any change under the no action alternative.

This alternative is likely to result in increased visitor/manatee interactions, which could lead to future take of manatees. Because other threatened, endangered, or protected species are not known to frequent the warm water springs located at Three Sisters Springs, the likelihood of disturbance of these species is low.

##### *4.1.1.2 Impacts to Human Environment*

This alternative would not change existing human environment conditions, including recreation and socioeconomics.

#### **4.1.2 Alternative 2 (Proposed Action Alternative)**

Within the authority of the National Wildlife Refuge Administration Act and the Agreement, the Service is directed to keep the warm water springs at Three Sisters Springs open to public recreation, maintaining and sustaining quality visitor experiences while at the same time providing adequate protected areas for manatees managed for the benefit of both manatees and visitors. The warm water springheads at Three Sisters Springs provide refugia to hundreds of manatees during cold-weather conditions and are considered among the highest priority thermal refuges for the species throughout its range (FCT 2010).

This alternative proposes to implement proactive management measures/strategies to address concerns related to increased crowding between manatees and the public inside the warm water springs at Three Sisters Springs. These interim measures, described in Chapter 2, will be evaluated, monitored, and adapted to assist in developing final management actions to be implemented under the CCP. Monitoring will be in compliance with USFWS Inventory and Monitoring Policy and will include data collection as listed below (See Appendix F):

- Number of visitors
- Average time visitors spend at Three Sisters Springs
- Manatee numbers
- Manatee reactions and/or interactions with visitors
- Weather conditions
- Tidal stage
- Gulf water temperatures
- Water Quality

#### 4.1.2.1 Impacts to Biological Environment

The current condition of the biological environment attributes, including hydrology and vegetation, would not experience any change under the proposed action alternative.

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. Research suggests that some manatees are harassed by visitors, despite the fact that all forms of harassment are prohibited by law. Scientists have conducted numerous studies on human – manatee interactions and expressed concerns over these interfaces. 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). Researchers have also observed and documented manatee responses to people and boats (Sorice *et al.* 2003, p. 324). 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, pp. 23–26; Wooding 1997, p. 1; King and Heinen 2004, pp. 230–231). They also observed that increases in numbers of boats and people prompted manatees to use other areas (Kochman *et al.* 1985, pp. 922–924; Buckingham *et al.* 1999, p. 514). 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, p. 320). Nor have there been any significant increases in the number of cold-related injuries and mortalities in the northwestern 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 northwestern region are among the highest in Florida (Runge *et al.* 2007, p. 20).

Observations of manatee harassment 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 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; October 22, 1979). Subsequently, three manatee sanctuaries were designated in Kings Bay in 1980 (45 FR 74880; November 12, 1980) and, in 1983 the Service purchased lands in and around Kings Bay and established the Crystal River NWR for the purpose of protecting manatees and to educate the public about 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 (59 FR 24654; May 12, 1994). This expansion was followed by the addition of another sanctuary in 1998, 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; October 16, 1998; See Table 1).

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

<b>Date of Kings Bay manatee sanctuary designations</b>	<b>Approximate number of manatees using Kings Bay</b>	<b>Estimated number of people viewing manatees</b>	<b>Number of sanctuary designations NEW (TOTAL)</b>
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)

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, boating 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. During the manatee season (November 15 through March 31), the network includes seven 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 boating 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. Given the State’s statutory responsibilities, the State designated a 35-mile per-hour (mph) (daytime) / 25 mph (nighttime) watersports area (watersports area) in Kings Bay between May 1 and August 31. This area encircles Buzzard Island in the center of the bay.

Refuge staff is concerned that the increased use of the warm water springs at Three Sisters Springs by the public could disrupt manatees from resting resulting in “take.” Take, as defined by Section 3(19) of the Endangered Species Act, 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 (50 CFR 17.3). Take, as defined by Section 3(13) of the Marine Mammal Protection Act (MMPA), means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any 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; 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. All take, including take by harassment, is prohibited.

During peak periods, especially weekends and holidays, increased public visitation to warm water springs at Three Sisters Springs has the potential to cause take of manatees. Because the confined springs at Three Sisters Springs are one of the few natural wintering manatee aggregation areas where human access is not controlled, inappropriate interactions between humans and manatees can occur from both swimmers and paddlers. Refuge staff currently educates visitors on passive observation procedures for interactions with manatees. However, swimmers can cause unintentional disturbance to manatees in a number of instances including: stumbling onto resting manatees due to lack of visibility during turbid conditions; touching resting surfacing manatees (breathing) due to misjudgment (sleeping vs. non-sleeping manatee); accidental kicking of resting manatees by swimmers; splashing and other swimming related noises; and free diving activity. Paddlers observing manatees from non-motorized vessels may unintentionally disturb manatees due to the reflection of glare on surface water restricting paddlers’ ability to see breathing or resting manatees on the surface. Paddlers accidentally paddle overtop of resting manatees causing unintentional disturbance while trying to avoid collision with surfacing manatees and/or swimmers. Manatee harassment, largely associated with wintertime manatee viewing activities, is known to occur, and the Service, State, and other law enforcement agencies actively enforce harassment laws in Citrus County and in Kings Bay. Cited acts of harassment include trespass by individuals viewing manatees in manatee sanctuaries where the Service has determined that any waterborne activity occurring within these areas will result in take of manatees, including but not limited to take by harassment. When observed, violators are warned or cited. During the winter of 2012/2013, refuge law enforcement officers issued 41 written warnings and/or citations within Kings Bay and Three Sisters Springs for violations of the Endangered Species Act or the Kings Bay Manatee Protection Area Rule. Manatees could be disturbed inside the warm water springs located at Three Sisters Springs from in-water wildlife viewing especially because no interaction-free refugia exist within the confined spring. Given past evidence of take (including harassment) of one or more manatees, and the establishment of manatee sanctuaries and refuges in Kings Bay, coupled with increased usage of the warm water springs at Three Sisters Springs and the increasing public demand to view

manatees, the Crystal River NWR deems it is necessary to implement these management actions to prevent take from occurring at Three Sisters Springs in the future.

The measures under this alternative will likely avoid take of manatees by providing two additional areas without public interactions due to two lobes of the warm water springs at Three Sisters Springs being closed to public access (Figure 3). The two new closed areas will preclude all waterborne activities within their boundaries, preventing take from both boating and manatee viewing within these areas. These lobe closures are provided for in the current Management Plan and are a measure that provides manatees space away from visitors in the Spring's interior. Since other threatened, endangered, or protected species are not known to frequent Three Sisters Springs the likelihood of disturbance to those species is low.

#### 4.1.2.2 Impacts to Human Environment

This alternative would have negligible impacts to the human environment conditions, including recreation and socioeconomics. The Service acknowledges that this alternative may have some local economic effect but that would be negligible for the overall local economy. 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 this alternative, exists. Additionally, this alternative guides public access to one side of the spring run and could limit the number of people within the warm water springs at Three Sisters Springs. While this alternative would reduce and/or restrict some users from within the interior of the warm water springs at Three Sisters Springs, the improved wildlife viewing opportunity could have a positive economic effect.

Table 2. Summary of Affected Environment.

Affected Environment	Alternative 1	Alternative 2
<b>Biological</b>		
Hydrology	No Change	No Change
Vegetation	No Change	No Change
Manatees	Potential Disturbance	Minimizing Likely Disturbance
Other Protected Species	No Change	No Change
<b>Human</b>		
Recreation	No Change	Potentially Improve Manatee In-Water Viewing
Socioeconomic	No Change	Potentially Increasing Cost per In-Water Visitor

## **4.2 Statement of Cumulative Effects**

National Environmental Policy Act 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).

Given the very limited physical scope of the proposed alternative (1.5 acres) and the temporary duration of the alternative (November 15 - March 31), no cumulative effects are likely. The information gathered from the temporary management actions may be used to guide future human/manatee actions at Three Sisters Springs, but any specific management actions will only apply to Three Sisters Springs. There will be no changes to the network of federal and state manatee protection areas in Kings Bay, to federal and state law enforcement efforts, or to the existing takings and harassment regulations currently in effect.

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## RESPONSE TO PUBLIC COMMENTS

The alternatives and scope of the affected environment for this EA have been formed by previous public comments on and meetings for the Crystal River NWR CCP which included public meetings on February 6, 2008; November 16, 18, and 20, 2010; December 2, 2010; January 4, 2011; July 7, 2011; March 19, 2013; and July 11, 2013. For public review of this EA, Crystal River NWR provided a short summary of the proposal, informed the public how and where to get the entire EA, and provided a 14-day comment period ending January 2, 2015. Details about the comment period and how to respond were provided to the public and stakeholders through emails, websites, public notices, and postings at the Crystal River NWR headquarters. The Final EA will be available at the Crystal River NWR office, on the Crystal River NWR website, and at the Crystal River Public Library.

During the comment period, we received approximately 5,000 written comments. A majority of the comments were non-governmental organizations' form letters or petitions with multiple signatures. Overall, comments came from individuals, conservation organizations, property owners, tour operators, business owners, local officials, and other stakeholders. The majority of the comments expressed support for the protection of manatees at Three Sisters Springs through varying levels of management. A few opposed the interim measures, but did not provide substantive data or information for the Service to consider at this time.

Those expressing support generally either supported the interim measures as proposed with some minor modifications, or expressed concerns that it was not extensive enough. The varying levels of management suggested were from complete closure of the springs to time allotments for visitors. Comments outside the scope of the EA were noted for future reference during the formulation of the Crystal River NWR CCP, but were not responded to in this document. The Service's responses to comments regarding specific measures in this EA are listed below.

*Comment:* Change the location of the non-motorized vessel tie-up (preferably to the west of Three Sisters Springs and Three Sisters Springs sanctuary).

*Response:* Three Sisters Springs sanctuary, locally known as Idiot's Delight Number 1, can be expanded up to 400 feet from the spring vent according to the Kings Bay Manatee Protection Areas Rule. The shallow, sandy substrate at the identified location is also an ideal area for paddlers to get in and out. Due to these considerations, the area chosen for the non-motorized vessel tie-up on the east side of the springs was closer to the spring run for snorkelers. Additionally, manatees aggregated less in this area.

*Comment:* Alternative suggestions for dividing the spring run and lobe closures.

*Response:* The consideration for which lobes to close within Three Sisters Springs was based on staff observations of manatee aggregations within the Springs. Data collected in December 2014 (see Appendix F for survey details) corroborated these observations. One in-water survey recorded over 60 manatees in the eastern lobe and only 17 manatees divided between the center and western lobes. No manatees were observed using the deep center. All manatees were located in the shallow lobes or along the edge of the deeper center lobe. Additional data currently being collected has documented over 400 manatees using Three Sisters Springs to

thermoregulate overnight. The Crystal River NWR staff will continue to evaluate the data as it is collected and will exercise adaptive management.

*Comment:* Creation of lobe closures will cause crowding in the middle spring.

*Response:* The middle spring may become crowded with visitors while manatees are trying to access the sanctuaries in the eastern and most western springs. On very cold days, the Service has the authority under the Kings Bay Manatee Protection Area designation to close Three Sisters Springs to all public access to protect this thermal area for manatees. This action has been done during several past cold-weather events and will continue to be used in the future. The Service also has the ability to close Three Sisters Springs under 50 CFR 25.21 (e) for the safety of the public or to protect the resources of the area, including manatees.

*Comment:* Initiate a “no touch” policy.

*Response:* The Service recommends passive observation of manatees; i.e., floating at the surface to view manatees (i.e., floating at the surface to view manatees). Additionally, by closing the eastern and western lobes of three Sisters Springs, manatees that desire no human interaction have an undisturbed sanctuary. Manatees can initiate contact with humans in the center lobes. A “no touch” policy and a minimum distance have not been implemented by Florida Fish and Wildlife Conservation Commission or the Service.

*Comment:* Prevent harassment of manatees.

*Response:* The Service implemented several prohibitions to prevent manatee harassment from recreational wildlife viewing. The prohibitions are in place to prevent manatee harassment, including not diving down on a sleeping manatee, not separating a cow and calf, and not surrounding a manatee. Additionally, the public no-entry areas created inside Three Sisters Springs allow manatees to rest undisturbed.

*Comment:* Limiting the number of recreationalists through time system, tag/coin system, lottery system, and hiring law enforcement to be gatekeepers.

*Response:* While all of these measures are excellent ideas and are being considered in the CCP, more data needs to be collected in order to make informed decisions regarding the appropriate number of recreationalists given the number of manatees present at any one time. Additionally, Crystal River NWR believes that the implementation of a system to limit the number of recreationalists would not be logistically practical this season. Data being currently collected will help staff adaptively manage this for the future.

*Comment:* Full closure or designate Three Sisters Springs as a sanctuary from November 15-March 31 annually.

*Response:* The Declaration of Restrictive Covenants from the Florida Communities Trust requires that Three Sisters Springs is managed only for the conservation, protection, and enhancement of natural and historical resources and for compatible passive, natural resource-based public outdoor recreation. Closing the springs to the public would violate the

Management Agreement (based in part on the Declaration of Restrictive Covenants) with the City of Crystal River which precludes a complete closure of Three Sisters Springs under the following:

“There are two provisions within the Agreement with the City of Crystal River that are relevant. These are Sections 2 and 3.”

Section 2 provides:

“The Service will manage the PROPERTY as an extension of Crystal River National Wildlife Refuge in accordance with 1) the Plan; 2) the National Wildlife Refuge Administration Act of 1966, as amended, 16 U.S.C. § 668dd; 3) other acts of general applicability to the National Wildlife Refuge System; 4) Title 50 of the Code of Federal Regulations; and 5) Florida law and regulation.”

Section 3 provides:

“The Service will not alter the PROPERTY or engage in any activity including restrictions on public access or commercial or recreational activities except as currently provided for in the PLAN, or as subsequently amended, without the prior written approval of the City and the District.”

Additionally, the declaration of restrictive covenants requires a management plan be created for the site which states:

“The public currently accesses the Three Sisters Springs by water, entering the springs while in the water or by kayak/canoe, primarily to view manatees, no motorized crafts, such as motorboats, jet skis, etc., will be allowed in the springs or the spring run. Management activities will include providing compatible, wildlife-oriented recreational opportunities for visitors while optimizing use of the springs for manatees. Compatible uses of the site will likely include existing in-water uses, managed to enhance visitor experiences and minimize manatee disturbance. FWS may enact partial closure of Three Sisters Springs during the coldest winter months and would consider full closure only for extreme cold winter events.”

The Service is committed to providing and facilitating a high-quality and safe wildlife viewing experience for visitors that does not disturb manatees in Three Sisters Springs.

*Comment:* Use of flash/strobes in photographing manatee.

*Response:* Given the limited scientific information on vision and light sensitivity in wild Florida manatees, the Service applies the ‘precautionary principle’ (the precept that an action should not be taken if the consequences are uncertain and long-term impact to protected or vulnerable wildlife unpredictable) with regard to this issue in order to prevent potential disturbance or harm to endangered Florida manatees eyesight. Photographers who wish to use flash, may obtain an additional permit from the Service’s Division of Management Authority. Crystal River NWR will recognize this permit for any artificial photographic lighting which requires a minimum approach distance of 20 feet away from any manatee. Photographers would still be required to

obtain a Crystal River NWR special use permit and abide by any special conditions associated with it.

*Comment:* Allow photographers into Three Sisters Springs before and after proposed public open hours.

*Response:* Photographers will be allowed entry in the springs during the same open hours as the general public.

*Comment:* Ban GoPro sticks.

*Response:* The Service has not evaluated the use of pole-like extension devices for cameras, but will include these devices in the CCP. Regardless, pole-like extension devices for cameras cannot be used to cross into closed areas or sanctuary boundaries and are considered devices which can compromise one or more of the 12 prohibitions that govern manatee viewing in the water.

*Comment:* Implement the as-needed, refuge closure provision in the National Wildlife Refuge Administration Act, as amended (50 CFR 25.21(e)).

*Response:* The Crystal River NWR has the ability and will exercise this provision in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources of the area, including manatees. The Refuge Manager may close or curtail refuge uses of all or any part of an area open to public access and use in accordance with the provisions in 50 CFR 25.21(e), without advance notice.

*Comment:* Ecotourism certification for tour operators or propose limits on the number of operators and visitors that can access the Three Sisters Springs at any one time.

*Response:* The Service issues Commercial Tour Operator Special Use Permits (SUPs) to a limited number of local and outside-the-area manatee tour operators. These SUPs are conditioned with specific requirements that provide clear guidance on how the Service expects tour operators and their guests to conduct manatee viewing. Service CCP will provide detailed guide, tour operator, and visitor manatee viewing guidelines and policies. The Service anticipates finalizing the CCP in 2015.

*Comment:* If paddle craft are banned from Three Sisters Springs, will paddle tour operators be able to trade in their SUPs for paddle tours for swim-with SUPs?

*Response:* The Crystal River NWR issues a set number of SUPs for commercial tours for both snorkeling and paddle craft entry into Three Sisters Springs. If paddle craft are restricted from Three Sisters Springs, this still allows the commercial paddle tour operators, under their existing SUPs, to allow their clients to tie up outside the entry to Three Sisters Springs and clients can snorkel into the Springs.

*Comment:* Disabled visitors and captains should be allowed to use kayaks in Three Sisters springs.

*Response:* The Service is committed to supporting the accommodations necessary for Americans with disabilities when viewing wildlife at the Three Sisters Springs. With the boardwalk open daily for the full manatee season, mobility-impaired or otherwise disabled individuals can view manatees from a higher vantage point rather than being on the water. In-water access by non-motorized vessel for mobility-impaired individuals to Three Sisters Springs during manatee season will be provided through special use permit only. Mobility-impaired is defined as a permanent physical condition that severely impairs mobility, which requires the assistance from a wheelchair, braces, crutches, or other similar aids of mobility. Applicants must also provide a letter from a physician to verify the applicant's physical condition that severely impairs their mobility without proper assistance. The level of impairment must be stated in a letter to verify the extent of the applicant's condition. The physician's letter must be on an official letterhead with the physician's original signature. Additionally, all visitors and captains, disabled or not, can view manatees throughout the rest of Kings Bay.

*Comment:* No restrictions should be implemented for swimmers and vessels in Three Sisters Springs.

*Response:* The Service is committed to promoting and facilitating a wildlife viewing experience in Three Sisters Springs that is of high quality, safe, and does not disturb manatees. The public demand to enter the springs along with increased manatee usage of Three Sisters Springs has resulted in a situation where the sheer numbers of visitors are crowding manatees and potentially affecting their behavior. In order to prevent disturbance of manatees, the Service will implement measures to control this issue and evaluate and adapt our measures for inclusion in the CCP. The Service has observed that the presence of paddle craft in Three Sister Springs have inadvertently interfered with manatee activity and swimmers when swimmer or manatee numbers are high. Banning paddle craft during periods of high manatee usage or swimmer presence allows the Service to control negative interactions between vessels and manatees or people. We intend to use this measure with an adaptive approach based on the variables of numbers of manatees and people.

*Comment:* Allow Manatee Watch to use non-motorized vessels inside Three Sisters Springs with swimmers to enforce the rules.

*Response:* Crystal River NWR has the discretionary management ability to continue to allow Manatee Watch volunteers on paddle craft to maintain a presence in Three Sisters Springs to help with the visitors in the water and to assist with this manatee season's interim measures.

*Comment:* Divide the day in half for allowable entry into Three Sisters Springs by both swimmers and paddlers.

*Response:* The Service is evaluating this as an option and retains the management discretion to implement such an approach. With the boardwalk open daily for the full manatee season, visitors who do not snorkel can view the manatees from a higher vantage point rather than being on the water in paddle craft in Three Sisters Springs.

*Comment:* Keep Three Sisters Springs natural by not developing on the land or in the water/remove the underwater cameras.

*Response:* Land-based development is outside of the scope of this EA. Underwater sanctuary markers will be used to designate the sanctuary boundaries for the lobe closures to reduce visual impairment of the springs on the surface. The lines used by swimmers for assistance along the spring run will be changed to a color that blends in better with the surrounding environment. The cameras in Three Sisters Springs are collecting data.

*Comment:* The proposed time window for entry into Three Sisters Springs of 10:00 a.m. to 5:00 p.m. will only serve to crowd the springs even more and is not based on consistent manatee usage based on tides and weather.

*Response:* Based on comments received, we are not advancing this interim management measure. The Service recognizes that this measure is inflexible and restrictive and is not substantiated at all times during the manatee season. Originally, this measure was proposed to allow manatees to rest undisturbed following the coldest period of the day (the early morning before dawn) and slowly adjust, undisturbed to the rising air temperatures of the day after sunrise. USGS observations of tagged manatees have suggested that manatees travel to the Gulf to feed at night when vessel traffic is less and return to Kings Bay in the early morning (Dr. Robert Bonde, personal communication). Research by refuge staff and volunteers indicates that tidal fluctuations are the predominant driver of manatee use and aggregations in Three Sisters Springs despite colder air temperatures. Generally, manatees begin to migrate into the springs in large numbers at a mid-flood tide taking advantage of the higher water elevations. Similarly, manatees tend to leave the springs at the mid-ebb tide, seemingly indicating that they are uncomfortable with the shallow water depths. At lower tidal stages manatees aggregate in the Idiots Delight 1 and 2 seasonally-closed sanctuaries outside of Three Sisters and then migrate back into Three Sisters Springs as the waters rise. Using a 10:00 a.m. to 5:00 p.m. springs public opening would disregard these observations. The refuge will instead flexibly-manage opening and closing the springs on an intra-day basis using observations of tidal cycles and manatee numbers in Three Sisters Springs. Thus we are not advancing this interim management measure but will instead rely on employing, as-needed, a refuge closure provision to adaptively manage opening and closing the springs based on observations of manatee usage in Three Sisters Springs. This closure authority is found in the National Wildlife Refuge Administration Act, as amended (50 CFR 25.21(e) which provides the manager the ability to close a refuge or portion thereof in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources of the area, including manatees.

*Comment:* Alternative time window for entry into Three Sisters Springs (9 a.m. - 5 p.m. instead of 10 a.m. - 5 p.m.).

*Response:* See Response above.

*Comment:* The Service failed to provide adequate public notice by not publishing the Draft EA in the Federal Register.

*Response:* The Service provided public notice of the Draft EA through a series of communiques, emails, and website postings sent out to a comprehensive list of stakeholders, concerned citizens, partners, general members of the public, media outlets, public and private organizations, as well as private and public officials that work with Crystal River NWR as required by an emergency Environmental Assessment. This action was deemed to satisfy the provision that to the fullest extent possible under this very limited proposed action in Three Sisters Springs.

*Comment:* The planned bisect within the spring run may actually result in increased manatee harassment.

*Response:* The Service installed a line on either side of the narrow spring run to guide visitors to the sides of the run. These lines run as close to the rocks as possible to keep visitors out of the narrow deeper channel that manatees prefer to use. While there can be no expectation that manatees will use the deeper channel, observations show that they tend to swim there.

*Comment:* Prohibiting people who would prefer to enter the springs via paddle craft would now be more likely to swim in, presenting a greater degree of crowding in the spring.

*Response:* People who paddle have the greater 400+ acre Kings Bay area to see manatees. Paddlers can also view manatees from the boardwalk that is open daily for manatee season. The Service will continue to evaluate observations of paddle craft's effects on manatees while in Three Sisters Springs. The Service has observed that due to paddle craft's length that paddlers cannot always avoid crossing over manatees in the spring run or springs. Additionally, they have had conflicts with snorkelers for the same reason. We will continue to evaluate the numbers of people entering Three Sisters Springs and we believe that the additional swimmers who were paddlers would not additionally crowd the Springs.

*Comment:* The Service's proposed measures do nothing to limit the number of hourly or daily visitors that enter the springs.

*Response:* The Service does not currently have the capacity or means to limit the number of entrants into Three Sisters Springs during this season. In our forthcoming CCP, we will be presenting means by which we intend to control entrants into the springs for the 2016 season and onwards.

*Comment:* With respect to the lines that guide people to the sides of the spring run, there is no guidance as to whether swimmers will be walking up the run or swimming.

*Response:* The Service plans to address what is appropriate and compatible wildlife viewing equipment and behavior with respect to swimming, use of mask, fins, snorkel, and other flotation devices, as well as conduct such as splashing and wading, in the forthcoming CCP for springs management from 2015 forwards.

*Comment:* Failure of the Crystal River NWR to come to an understanding and provide an eco-tourism experience.

*Response:* This is outside of the scope of this EA. However, the Service will address its approach to what is a compatible and appropriate wildlife viewing experience in Three Sisters Springs with manatees in a way that is a high-quality experience that does not disturb manatees in the forthcoming CCP for springs management from 2015 forwards. The Crystal River NWR manages wildlife viewing in its refuge lands and waters but does not manage these activities outside the refuge.

*Comment:* The Service unjustly relies on the Florida Communities Trust (FCT) Restrictive Covenants, the Management Agreement with the City and the Water Management District, and the Three Sisters Springs Project Management Plan with the City of Crystal River.

*Response:* The FCT Restrictive Covenants guides the City in what is expected as a result of that contract with the State of Florida. This, in turn, guides the Service under the Management Agreement with the City and the Water Management District. The Service and the City are guided by these agreements in the Three Sisters Springs Project Management Plan. The Service has conducted a legal review of the Management Agreement. With our partners in the City, The Service understands that we must uphold all federal statutes that guide the Crystal River NWR, while at the same time are, limited in how we can restrict public access to Three Sisters Springs by the FCT Restrictive Covenants and Management Agreement. The public has had access to that springs for years before it became a national wildlife refuge and has come to enjoy a certain set of expectations of access that are reflected in the FCT Restrictive Covenants, the Management Agreement, and the Three Sisters Springs Project Management Plan. The Service, in partnership with the City of Crystal River and many stakeholders in the community, have made much progress on the goal of providing compatible, wildlife-oriented recreational opportunities for visitors while optimizing use of the springs for manatees and protecting resting manatees from disturbance. This progress continues and will culminate in our management measures as presented in the forthcoming CCP for springs management from 2015 forwards.

*Comment:* The Service could essentially eliminate harassment of manatees at Three Sisters Springs by implementing a winter sanctuary closed to public access. The simple act of separating people from manatees solves this management problem while comporting with the law. To do otherwise leaves the Service at severe risk of being found to be aiding and abetting large scale illegal take of an endangered marine mammal that are charged to protect, especially when so many reasonable, prudent, and economically viable alternatives exist.

*Response:* The Service has weighed its options and management measures in light of administrative procedures, time frames, refuge and staff capacity, funding, the wider public and local community expectations, legal issues, and economic and social expectations and impacts. We have determined that these interim measures are the best course of action when weighted by the many variable factors listed. Additionally, we are collecting data on springs usage and activity to inform management measures that will be presented in the forthcoming CCP for springs management from 2015 forwards.

*Comment:* FWS needs to adopt a precautionary approach that provides sufficient protection to ensure that harassment of manatees is avoided such that interim measures be expanded to allow for immediate short-term closures of Three Sisters Springs during periods of high manatee use or if there is evidence that manatees are being displaced from the Springs by human activities.

*Response:* The Service intends to use its authority under 50 CFR 25.21 which allows that in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources of the area, including manatees, the Refuge Manager may close or curtail refuge uses of all or any part of an opened area to public access and use.

*Comment:* That FWS develop and implement a monitoring program to (1) collect information on the use of the springs by humans, particularly swimmers and boaters, and on manatee responses to human presence and different activities and (2) document instances of harassment of manatees.

*Response:* The Service has established a data collection program identifying the types and levels of human presence in Three Sisters Springs as well as manatee usage and behavior (Appendix F). Upon preliminary analysis of the monitoring data, results do not show clear evidence of manatee responses to people's presence, that manatees are being displaced, or that their normal behavioral patterns are disrupted. Manatee Watch volunteers, often numbering two on the boardwalk and two to four in the water on paddle craft, help educate and inform the public of permissible ways to passively view manatees and to discourage inappropriate behavior.

*Comment:* The Service's proposal will likely result in the continuation of unpermitted "take" in violation of the ESA and MMPA.

*Response:* The Service disagrees with this observation. The proposed measures, when put into practice and enforced, will reduce the likelihood of take occurring. By eliminating watercraft from Three Sisters Springs, opening an access channel in the spring run, expanding no entry areas, and other measures, waterborne practices likely to take manatees in Three Sisters Springs are addressed in a manner consistent with the ESA and MMPA.

*Comment:* The Service's "not likely to adversely affect" conclusion in its biological opinion regarding the proposed action is indefensible.

*Response:* The Service conducted an intra-service section 7 consultation on the proposed action and concluded that the action would have "no effect" on the manatee or critical habitat. The Service concluded that the action would "not likely to adversely affect" manatees and critical habitat. In its "no effect" determination, the Service determined that the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, manatees and critical habitat.

*Comment:* Pursuant to the MMPA, incidental take has not been authorized for manatees and contends that the Service is authorizing incidental take through its proposed action.

*Response:* Pursuant to the MMPA, incidental take has not been authorized for manatees nor has the Service adopted regulations allowing for the take of manatees. The Service's proposed action does not authorize nor allow the take of manatees and, the proposed measures, when put into practice and enforced, will reduce the likelihood of take occurring. As such, the proposed action is consistent the MMPA's prohibitions on the taking of marine mammals.

*Comment:* Access to land by in-water recreationalists.

*Response:* Currently we do not allow any access from water to land or vice versa.

*Comment:* Data collection to address success of management actions and inform future decisions.

*Response:* Data collection will inform present and future management decisions. Currently we have two volunteers who assisted in developing and implementing current and future inventory and monitoring protocols. They will analyze data collected during the manatee season and provide a report of data analyses and recommendations.

*Comment:* Data collection of manatee reaction and/or interaction with visitors.

*Response:* Previous data has been collected through a special use permit on manatee reaction and/or interaction with visitors but data analysis has not been completed. Currently, this is outside the scope of data being collected, but we anticipate future opportunities to collect this much needed data.

The following comments were received but not addressed since they are outside the scope of this EA:

- Worldwide broadcasting of manatee cams;
- Extend Three Sisters Springs sanctuary designated under the Kings Bay Manatee Protection Area Rule;
- Install and mandate use of mooring buoys to prevent erosion;
- Evaluate spring flow;
- Cold fronts pushing water out of Kings Bay/manatees can't access Three Sisters Springs on a low tide;
- Purchase of Three Sisters Springs to protect manatees;
- Move the Manatee Festival off the three-day weekend;
- Create sanctuaries at House and Jurassic Springs;
- Ban fins, require masks and snorkels;
- Require prop guards;
- Restrict number of boats in Kings Bay; and
- Close boating and fishing access east of Kings Bay Drive.

If related to Crystal River NWR, these comments will be considered in the CCP and adaptive management will be applied as more data is collected and more informed decisions regarding the appropriate number of manatee and recreationalists are made.