

**Draft Environmental Assessment**

**Three Sisters Springs Unit of Crystal River National Wildlife Refuge:  
Proposed Aquatic Habitat and Wildlife Viewing Improvements  
Citrus County, Florida**

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## Executive Summary

Crystal River National Wildlife Refuge (Crystal River NWR or the Refuge) was established to conserve and protect threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the Florida subspecies (*Trichechus manatus latirostris*). Secondary purposes of the Refuge include providing for appropriate fish and wildlife oriented recreation, protection of natural resources, and conservation of additional endangered and threatened species.

The U.S. Fish and Wildlife Service (USFWS) proposes to improve Florida manatee viewing and habitat in Three Sisters Springs (the Springs), a 0.92-acre unit of Crystal River NWR. The unit is mostly enclosed freshwater habitat within the city limits of Crystal River and lies wholly within Citrus County, Florida. Located within the greater Kings Bay, the Springs are comprised of three 'lobes': Pretty Sister, Deep Sister, and Little Sister (also known as Hidden Sister) which are part of important winter habitat for Federally-listed endangered Florida manatees. In northwest Florida, approximately 17 percent of the entire population of this subspecies (2014 and 2015 Manatee Synoptic Surveys, Fish and Wildlife Research Institute) is supported. During colder winter months, manatees are attracted to the Springs' consistently warmer (72°F) spring-fed waters which they use as a thermal refuge. These warmer waters are vital for manatee thermoregulation due to their specific physiology that is lacking in functional insulation against the cold. Without access to these refugia, manatees are subject to potentially lethal cold stress syndrome. Over the past several years, increasing numbers of manatees, including mother-calf pairs, have been entering the Springs to rest and nurse their calves.

Visitors and local residents are also attracted to the Springs' clear waters. During the winter months, people come primarily to see or photograph manatees while snorkeling, paddling/canoeing, or utilizing the surrounding boardwalk. The popularity of the site has grown over the past several years as documented by visitor use data collected by the Refuge. Without appropriate management actions, recent monitoring suggests that during winter months, in-water visitors, particularly those entering and exiting the Springs via the narrow spring run, have the potential to disturb resting and nursing manatees. Without appropriate management actions, crowded conditions in this confined Springs habitat may unintentionally displace or change manatee behaviors in relation to their vital need to stay warm (i.e., thermoregulate).

Alternatives were proposed to improve wildlife viewing, increase public safety, avoid the potential for manatee disturbance during the winter season, and safeguard increasingly important manatee habitat at the Springs. In accordance with 50 CFR §25.21(e), under all of these alternatives, the Refuge may implement emergency closures of the Springs, and such closures may occur at any time to safeguard resources, including manatees, and/or for public safety. Alternatives include some common elements like the Southwest Florida Water Management District's planned project to stabilize eroding and vulnerable shorelines. The following briefly describes each alternative:

A) No Action: The No Action Alternative maintains existing management measures within the Springs and the spring run during manatee season, but does not provide for any additional measures.

B) Manatee Viewing from Land Only: Alternative B would protect resting and nursing manatees from potential disturbance by closing the Springs to all in-water access during the manatee season. It would enhance land-based manatee viewing opportunities for visitors through the construction of boardwalks and a viewing platform/observation area. This alternative would also protect manatees by limiting the threat of epizootic disease transmission by banning pets.

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C) Guided In-Water Manatee Viewing: This was the USFWS's previously proposed alternative. It would allow for limited, guided in-water manatee viewing. Like Alternative B, Alternative C would restrict pets to limit the threat of epizootic disease transmission to manatees and enhance land-based wildlife viewing opportunities for visitors. In-water wildlife viewing would be limited to 29 people including visitors, guides, and photographers/videographers. Additionally, six refuge staff or designees could be in the water for purposes such as, but not limited to, manatee rescue and release, research, environmental education/filming, and habitat restoration.

D) Modified Guided In-Water Manatee Viewing (Proposed Alternative): This alternative is a modification of Alternative C and would provide limited, guided in-water manatee viewing, improved land-based manatee viewing, and habitat improvements via partnerships. This alternative is the result of public and peer review comments. This alternative includes modifications to the measures described in Alternative C which was put forward in the August 2015 Draft Environmental Assessment. In-water wildlife viewing would be limited to 13 people including visitors, guides, and photographers/videographers. Additionally, six refuge staff or designees could be in the water for purposes such as, but not limited to, manatee rescue and release, research, environmental education/filming, and habitat restoration.

If Alternative D is selected, the Refuge would immediately implement all components except for the lottery selection processes for both snorkeling, and photography and commercial filming in the Springs. Those processes will be utilized for the season beginning November 2016. If this alternative is implemented during the current manatee season (November 2015 – April 2016), snorkelers and photographers will be provided access on a first-come, first-served basis. When the lottery selection processes are in place, the Refuge and the City of Crystal River will widely announce the availability.

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# I. PURPOSE AND NEED FOR ACTION

## A. INTRODUCTION

This Environmental Assessment (EA) addresses proposed actions to improve wildlife viewing where large numbers of recreational snorkelers and users of non-motorized vessels currently enter a relatively small area to view Florida manatees in their winter habitat where the animals rest and nurse their calves. It also addresses proposed management actions to improve Florida manatee habitat. The proposed actions of this EA would occur in the shallow, freshwater springs (0.92 acres) called Three Sisters Springs (the Springs), a unit of Crystal River National Wildlife Refuge (Crystal River NWR or the Refuge), and in the spring run connecting the Springs to a channelized section of Crystal River. The Springs themselves are situated on the larger property (57.1 acres) also known as Three Sisters Springs (Figure 1). The Springs consist of three springheads: Pretty Sister, Deep Sister, and Little Sister (Figure 2).

Figure 1. Location of Three Sisters Springs, Crystal River National Wildlife Refuge.

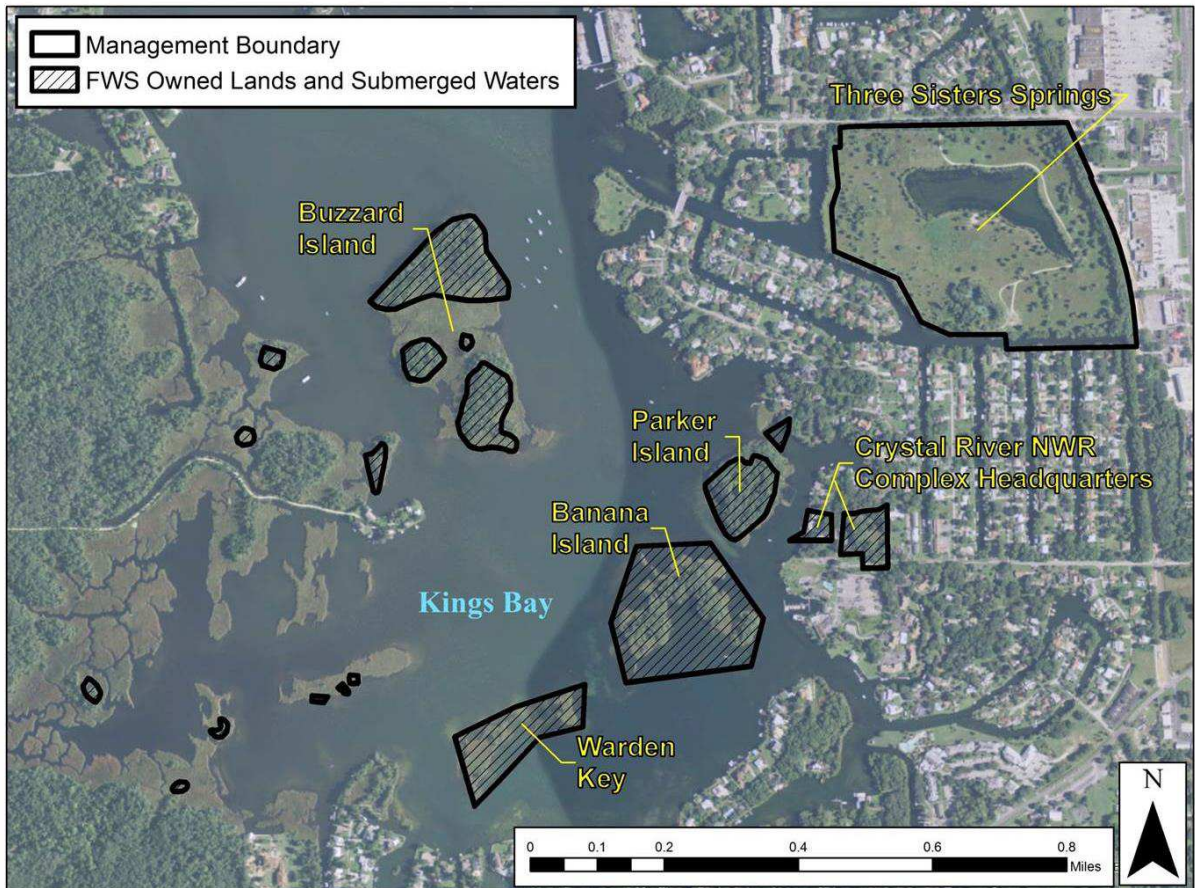
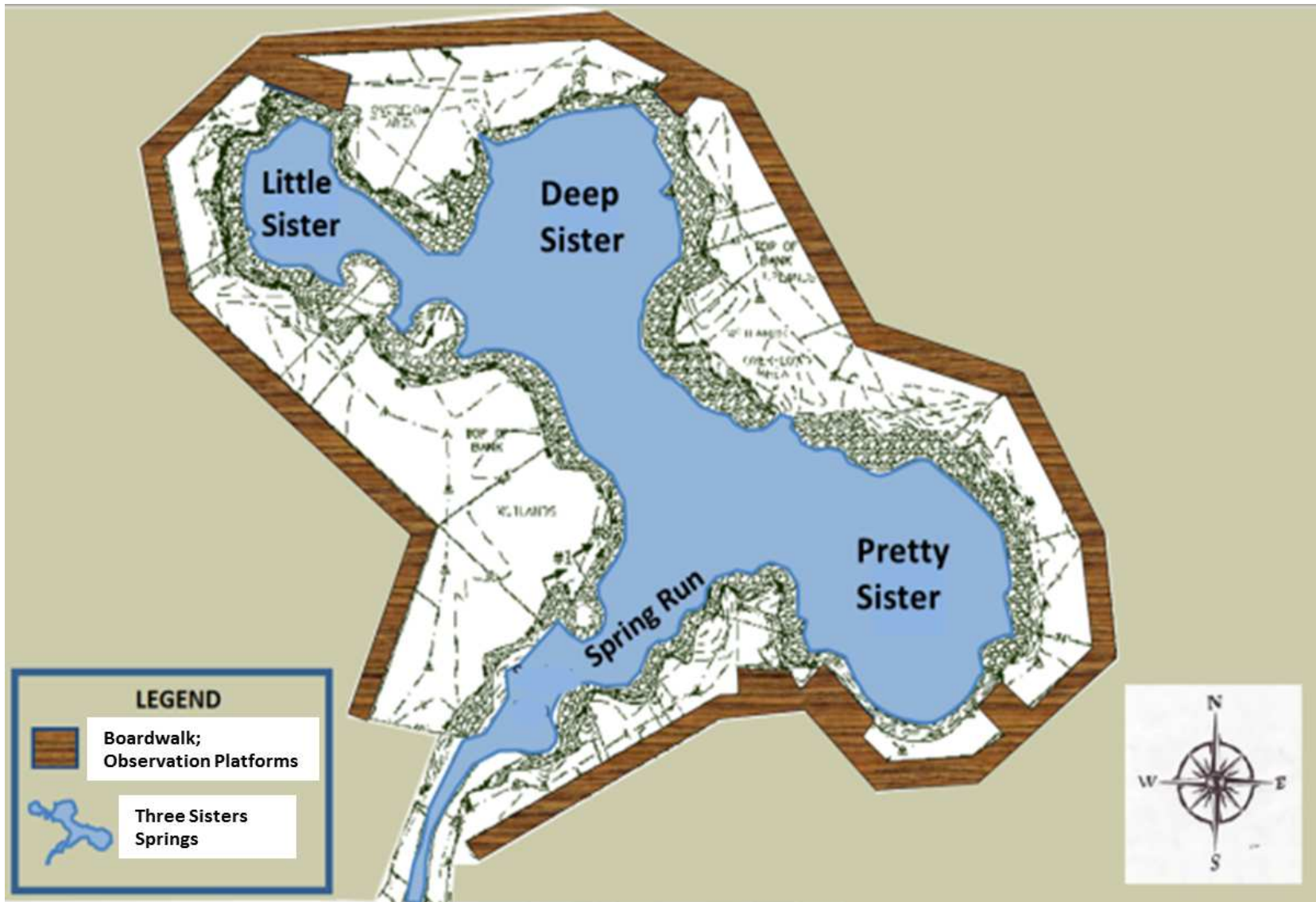


Figure 2. Area examined in the EA; three lobes of Three Sisters Springs, spring banks, the existing boardwalk with observation platforms, and the Sisters' entrance or 'Spring Run'.





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## 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 Act (ESA). The population is further protected as a depleted stock under the Marine Mammal Protection Act (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.

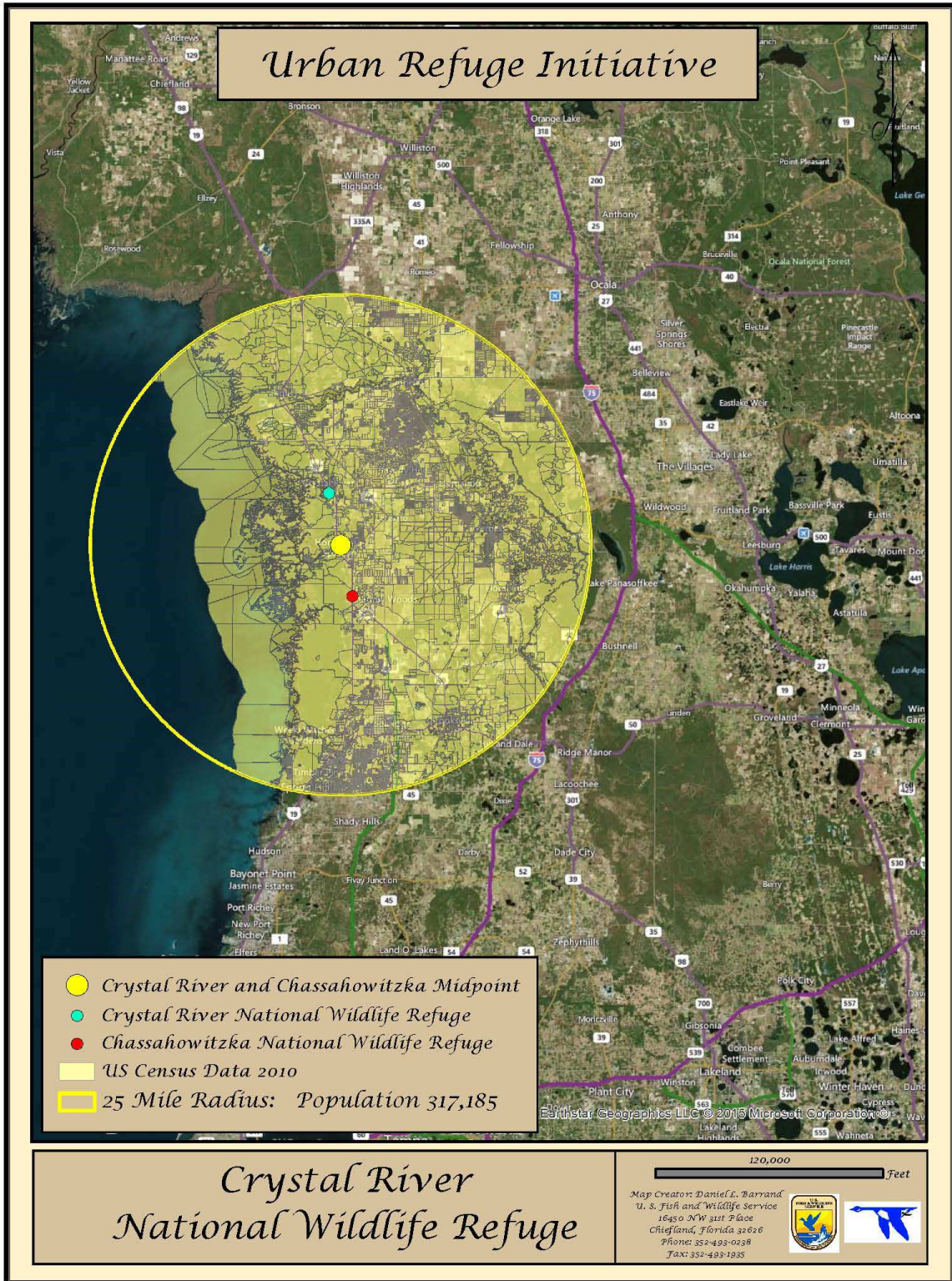
The Florida manatee can be found throughout the southeastern United States, with Florida at the core of its range. The 2015 statewide aerial survey observers counted 6,063 manatees, with 3,333 on the east coast of Florida and 2,730 on the west coast of Florida (2015 Manatee Synoptic Survey – Fish and Wildlife Research Institute). Given these counts, Citrus County is home to perhaps as many as 17 percent of the southeastern United States’ manatee population. The USFWS and the Florida Fish and Wildlife Conservation Commission (FWC) continue to work in collaboration, along with manatee scientists and other experts, to recover this species via the Florida Manatee Recovery Plan (USFWS 2001) and the Florida Manatee Management Plan (FWC 2007). In particular, considerable efforts are made to minimize human-related threats.

On October 22, 1979, the USFWS 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 influenced 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. The protection areas included the Banana Island Sanctuary (including King Spring), the Sunset Shores Sanctuary, and the Magnolia Springs Sanctuary (45 FR 74880). The USFWS 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, Kings Springs, and Three Sisters Springs sanctuaries, respectively) (59 FR 24654 and 63 FR 55553). Today, the USFWS manages these sanctuaries (Figure 1).

## Natural History of Three Sisters Springs

Three Sisters Springs is located at the eastern edge of Kings Bay and at the headwaters of the Crystal River. Being within the city limits of Crystal River itself, the lands and waters may be considered an urban-interface wildlife refuge (Figure 3). In 2014, visitation totaled 327,654 visits with 265,557 visitors (81 percent) accessing Crystal River NWR. (Commercial Special Use Permit Visitors Report 2014 for Crystal River NWR). The Springs, and the property they are on, also called Three Sisters Springs, 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.

Figure 3. Population within 25 miles of Crystal River NWR great than 300,000 people.

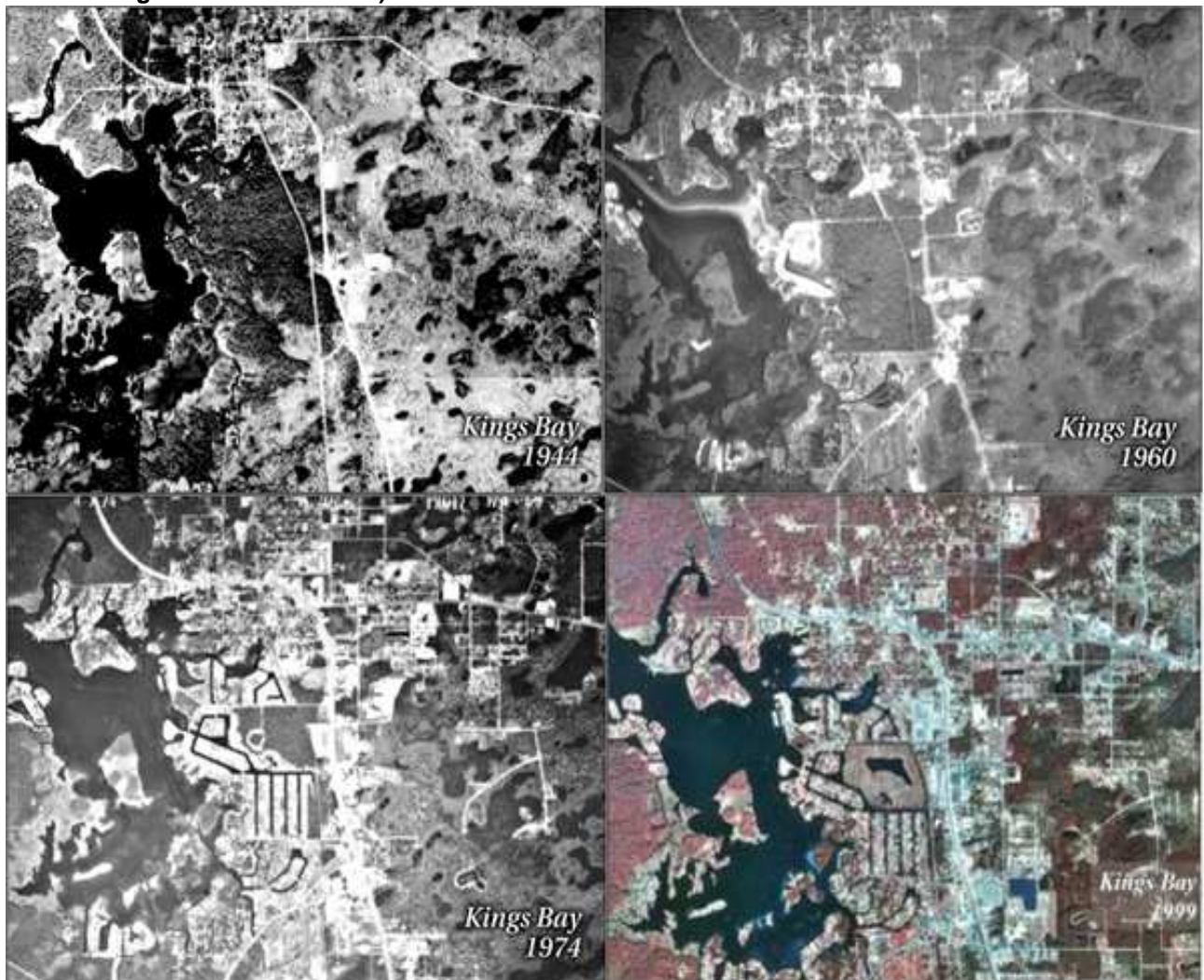


Prior to extensive development in and around the City of Crystal River, the site consisted of a forested wetland system that surrounded the Springs. The forested area extended further to the south than it does presently as seen in 1944 aerial photograph (Figure 4). By 1974, a residential canal was excavated that forms the present southern boundary of the Springs site (Google Earth).

Evidence from historical aerial photographs and the presence of levees, fill material, and sporadic boulders within the west-southwest riparian zone of the Springs suggests that the Springs, inter-pool connections, spring run, and riparian corridor may have been directly altered by the previous landowner during land use conversion for property development in the 1970s (Herrington 2012). The riparian vegetation was removed, the Springs and inter-pool connections were widened, and fill was placed atop the banks and the riparian zone. All of this occurred at the same time that the surrounding wetlands were filled during the construction of Lake Linda (Herrington 2012).

Between 1960 and 1985, much of the area around the Springs was cleared of native vegetation, and a large borrow pond, currently known as Lake Linda, was excavated to obtain fill material needed to raise ground elevations for future development.

**Figure 4. Environmental changes in and around Three Sisters Springs 1944-1999 (Southwest Florida Water Management District 2004).**



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To prevent access, a former landowner made several modifications to the Springs. In 1981, the former landowner placed over 40 large limestone boulders along the banks and the middle of the spring run entrance to the Springs to prevent motorboat access to the interior of the Springs. In 1982, to prevent boaters from pushing motorized vessels with raised motors to the interior of the Springs, the landowner installed six pilings at the entrance of the spring run, 36 inches apart from each other. The intent was to block access of larger boats, while allowing paddlecraft and swimmers/divers into the Springs.

A residential development was planned and permitted for construction in 2008, but the property owners ultimately agreed to sell the parcel surrounding the Springs to a consortium of public agencies for environmental purposes.

After obtaining management authority for the Springs in 2010, Refuge staff in consultation with FWC (as part of the Manatee Habitat Working Group, a sub-team of the former Florida Manatee Recovery Team) removed 20 large boulders from the spring run on October 26, 2010. The restoration effort improved manatee access to the Springs habitat. Today, the spring run provides the only in-water entrance to the Springs. The run measures approximately 165 feet in length, 5 feet wide at the narrowest point, and 18 feet wide at the widest point, at mid-tide.

A hardwood fringe provides a buffer around the springheads and run. Additionally, a narrow riparian zone, 1 foot to 40 feet wide, characterizes the perimeter of the Springs. The area around the Springs is comprised of open space with scattered trees.

Changes in hydrology resulting from filling the surrounding wetlands may have resulted in decreased water retention and increased surface and subsurface flow to the Springs and its banks, causing further bank instability given that the root structures are perched relative to the toe of the banks (Herrington 2012). Banks along the lobes and the spring run are vertical to severely undercut, with bank angles up to 160° and undercuts reaching more than 4 feet underneath some banks (Herrington 2012).

The Springs comprise a complex of three “lobes” aligned on a northwest-southeast axis, with an approximate total length of 250 feet (Figure 2). Each lobe of the Springs complex contains spring vents. The northwestern lobe (Little Sister) of the trio is centered at 28°53'19.46"N, 82°35'21.37"W and contains approximately twelve circular vents, with dimensions ranging between 0.5-1 feet. Water depths are estimated at 8-10 feet deep and discharge volumes are low to moderate. The middle lobe (Deep Sister) of the trio is centered at 28°53'18.70"N, 82°35'20.87"W and contains a large kidney-shaped vent approximately 20 feet long by 5 feet wide filled with debris, including tree limbs and vegetation. Water depths within this lobe are approximately 20 feet deep and discharge volumes are high. The southeastern lobe (Pretty Sister) of the trio is centered at 28°53'18.14"N, 82°35'20.16"W and contains approximately six vents, with dimensions ranging between 2.1 feet x 2.1 feet to 0.4 foot x 0.4 foot. Water depths are estimated at approximately 15 to 20 feet deep and discharge volumes are high (Southwest Florida Water Management District [SWFWMD] 2009). Matlacha soils surround the Springs. The disturbed soils are produced from dredging and grading work. The bottoms of the Springs and spring run are generally sand or exposed limestone; water clarity is generally good to excellent varying with tide and manatee numbers in the Springs (SWFWMD 2009).

In September 2011, the Crystal River NWR completed construction of a 1,300-foot boardwalk to provide land-based visitor access around the Springs and to prevent further erosion of the Springs' banks. The following month, the boardwalk was opened to the public for the first “open house.”

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## Natural History of Manatees in Three Sisters Springs

Aerial manatee surveys have been conducted over Kings Bay and Crystal River since 1967. Since Crystal River NWR was established in 1983, a Refuge biologist has conducted aerial surveys over Refuge and Citrus County waters. Winter surveys (October-March) are conducted when manatees seek out the warm spring water when the Gulf water temperature drops below 68°F. Numbers of manatees recorded within the Kings Bay portion of the survey, where Crystal River NWR is located, have steadily increased since 1983. During the winter of 1983-84, a peak count of 124 manatees was recorded on December 23, 1983, for the Kings Bay/Crystal River area (Kleen and Breland 2014). The latest aerial survey conducted on February 20, 2015, recorded 706 manatees in the Kings Bay/Crystal River area (USFWS 2015, unpublished data). This survey was part of the statewide Synoptic Aerial Manatee Survey in which 6,063 manatees were counted in Florida waters. Of that total, 1,016 manatees were counted in Citrus County, an estimated 17 percent of the state population.

Manatee use within the Springs has steadily increased since the 2005-2006 winter (Table 1). Initially, manatees could only access the interior of the Springs on a high tide, since boulders blocked their access to the interior of the Springs on a low tide. In 2008, small numbers of manatees were documented at the Springs. On the ground observations within the Springs confirmed the aerial observations in the area. From November 2006 to March 2009, ground count observations reported no more than 60 manatees using the interior of the Springs. These observations came from the dive tour operator Special Use Permit (SUP) holders, in-water counts by Refuge staff, and several researchers from the U.S. Geological Survey (USGS). In October 2010, 20 large boulders were removed from the spring run entrance to the Springs to allow manatees to access to the warm water habitat during lower tides. The following winter, an extreme cold weather event (coldest temperatures recorded in 100 plus years) occurred in Citrus County in January 2010. This corresponded with the lowest Gulf water temperature recorded on January 9, 2010 at Aripeka, Florida, of 40° F (Citrus County Chronicle 2010). These low temperatures caused manatee numbers to increase dramatically at the Springs as the animals sought to thermoregulate. Ground counts during this cold weather event recorded over 150 manatees using the interior of the Springs on high tides. Many manatees did not leave the Springs for three weeks, regardless of low or high tides, as the Gulf water temperature remained below 60° F. During 11 of those days, the temperature was below 50° F.

During the 2014-2015 winter manatee season, data were collected at the Springs to document human/manatee interactions and manatee use within the Springs and spring run for 30 days from December 10-January 31; sunrise to sunset. Information collected from the boardwalk surrounding the Springs included weather condition, tidal stage, air temperature, Kings Bay (the Bay), and Gulf water temperatures, and the number of manatees, swimmers, and paddlecraft, including the time of entry/departure ((Wolfe and Syverson, in prep.). This research documented up to 446 manatees resting in the Springs during the high tides when Gulf water temperatures were below 60°F (Figure 5). The number of manatees documented during the 2014-15 season was higher than previously estimated, indicating that more manatees may be resting and nursing in the Springs during winter months (Table 1).

Figure 5. Peak Springs' manatee (446) and visitor (1,252) numbers recorded, 2014-15. NOTE: The Springs were closed to visitors on some dates due to high numbers of manatees (compiled from data in Wolfe and Syverson, in prep.).

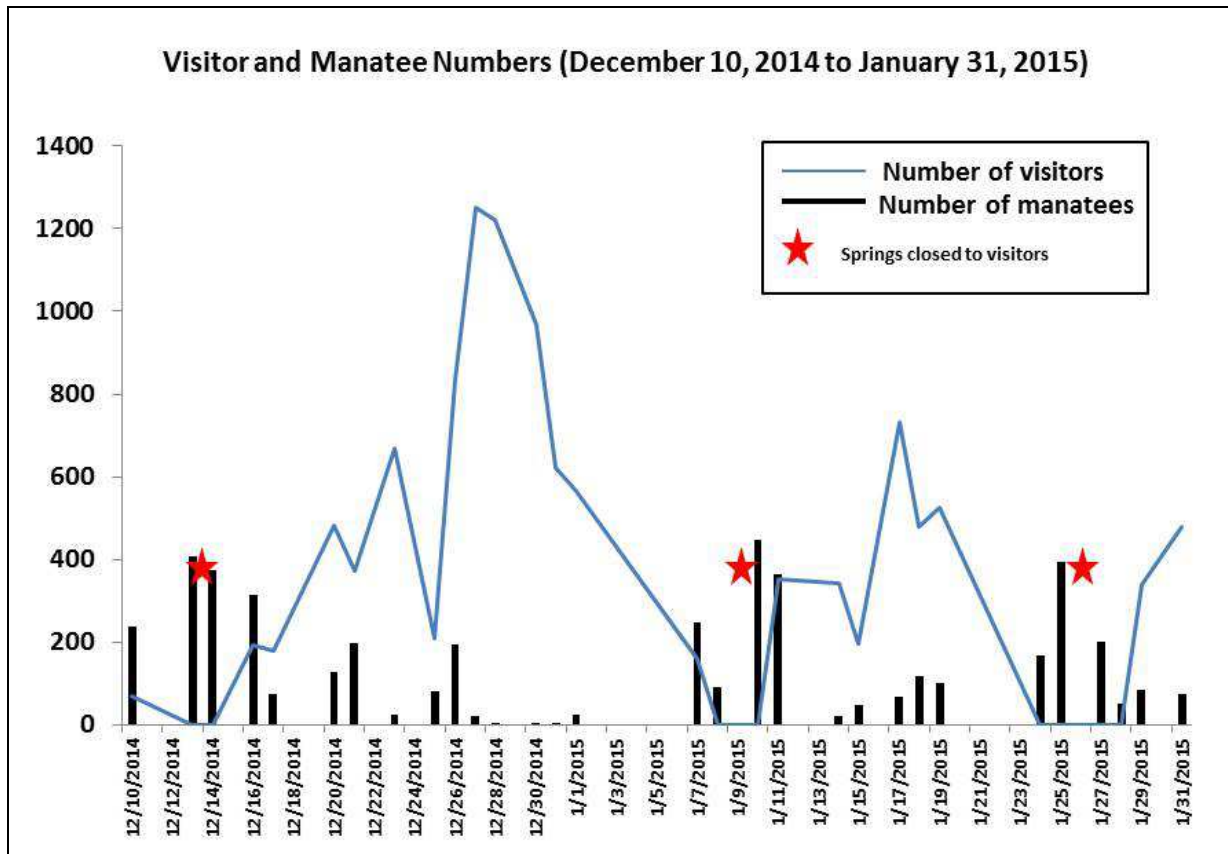


Table 1. Seasonal statistics for Three Sisters Springs- manatees and visitors.

Winter Season	Highest Estimated Manatee Numbers		SUP Reported Visitation
	Kings Bay/Crystal River	Three Sisters Springs	
2007-08	240	57	21,721
2008-09*	347	60	29,723
2009-10**	566	150	32,239
2010-11	519	250	41,633
2011-12	549	260	53,714
2012-13	314	180	58,399
2013-14	560	300	64,421
2014-15***	706	446	NA

\* Incomplete/Inconsistent Special Use Permit (SUP) holders reporting prior to 2009  
 \*\* Regular manatee counts begin at Three Sisters Springs  
 \*\*\* Refuge institutes regular, standardized manatee counts at Three Sisters Springs  
 NA = compiled seasonal visitation data not yet available

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## **B. PURPOSE AND NEED**

This EA evaluates proposed management actions in the context of the Declaration of Restrictive Covenants; the Management Agreement for Certain Lands Located Within the City of Crystal River, Citrus County, State of Florida; the Three Sisters Springs Project Management Plan; the USFWS's Florida Manatee Recovery Plan (USFWS 2001) and legal framework, ESA, MMPA, and purposes identified in the creation of the Crystal River NWR, as summarized below. The purpose and need for this management action is to minimize potential disturbance of manatees from otherwise lawful activities, minimize human interactions in a sensitive wintering habitat, and enhance sustainable wildlife viewing in the face of increasing human recreational uses and manatee habitat needs.

With the trend of annually increasing human visitation to the Kings Bay, there is a need to evaluate human and manatee interactions within the Springs to determine management actions for the future. For example, visitor numbers have nearly doubled since 2010, and from January 2014 to December 2014, a total of 136,738 people visited Crystal River NWR waters according to the SUP holder counts (Figure 6). Of these visitors, an estimated 97 percent entered the Springs. The guided commercial use of the Springs between November 2013 and April 2014 totaled 53,520 visitors; and November 2013 – April 2014 rental boat customers, who also frequent the Springs, totaled 21,699 (Commercial SUP Visitors Reports 2014 for Crystal River NWR). Without appropriate management actions, this volume of visitation in the confined Springs has the potential to disturb manatees' natural movements between the Springs used as resting and nursing habitat and foraging habitats outside of the Springs.

Of particular concern is the spring run area, the current in-water entrance to the Springs (Figure 2). At the narrowest point, at mid-tide, the spring run is approximately 5 feet wide. These limited dimensions create a bottleneck for manatees, snorkelers, and paddlecraft which may cause a safety hazard to visitors as well as the potential to disturb manatees. Additionally, manatee ingress and egress has strong possibility to be blocked on many occasions due to the high volume of snorkelers and boaters in the spring run. Manatees have also been documented to rest in the spring run. On one of the busiest days recorded, total passages by manatees, snorkelers, and paddlecraft through the spring run were 2,325 or one passage every 15.4 seconds. The same day, 842 snorkelers and 304 paddlecraft entered the Springs (Wolfe and Syverson, in prep.). Figure 7 shows the average number of passages in the spring run (manatees, paddlecraft, and/or snorkelers/swimmers) over a one-month observation period during the 2014-2015 manatee season. Without adequate measures implemented to address the crowding by visitors in the spring run, manatee natural behaviors could be compromised.

Figure 6. Yearly visitor numbers- January 1 to December 31- in Kings Spring and Three Sisters Springs (Commercial SUP Visitors Reports 2010-2014 for Crystal River NWR).

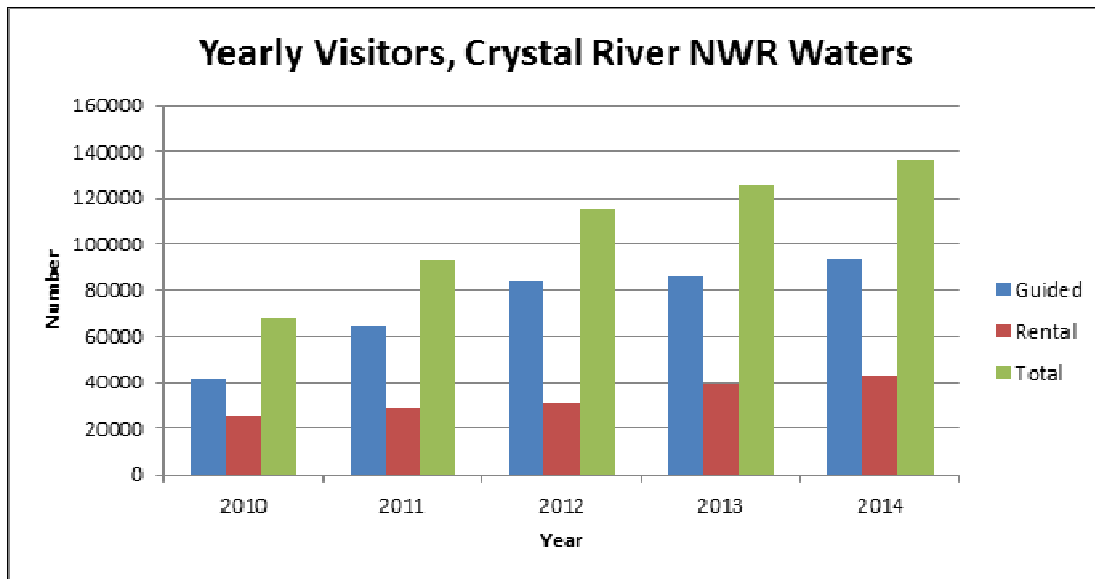
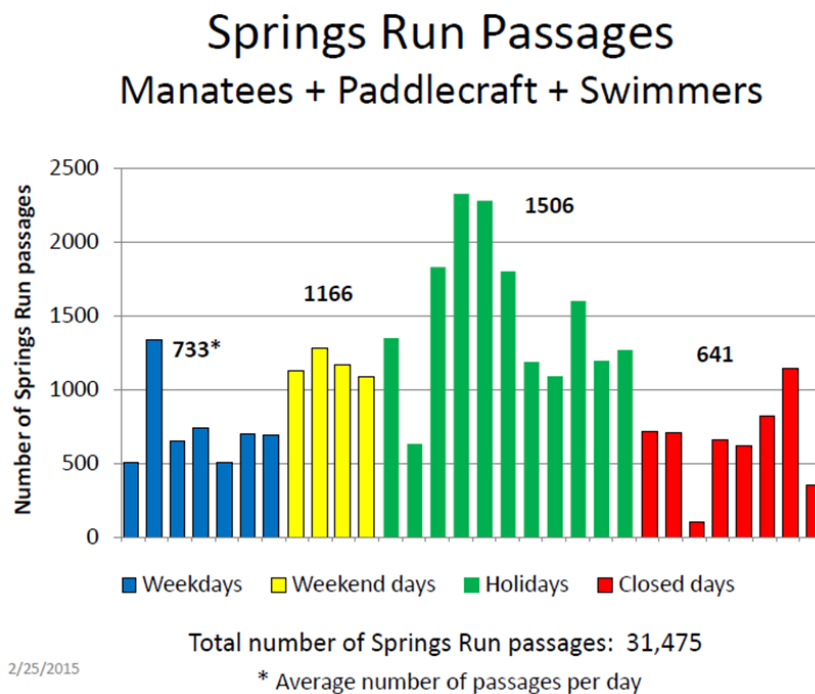


Figure 7. One month of observations for Spring Run Passages (Wolfe and Syverson, in prep.).



Thirty sample days, over the course of two months of observations, during the 2014-2015 manatee season (including 11 days defined as "holidays" between December 10 and January 31) revealed crowding and congestion by paddlecraft, snorkelers, and manatees in the spring run entrance to Three Sisters Springs which may cause safety hazards for snorkelers and potentially alter or impede manatee movements.



Additionally, USFWS law enforcement officers note an increase in warnings to Kings Bay visitors regarding the existing Twelve Prohibitions (see Alternative A), as well as an increase in the issuance of citations between 2004 and 2014 (Table 2).

**Table 2. Fish and Wildlife Law Enforcement Issuance of Warnings, Citations, and Manatee Incidents from 2004-2014.**

Year	Warnings*	Citations	Management Change or Staffing Description
2004	4	2	1 full time officer
2005	26	4	1 full time officer
2006	35	4	1 full time officer
2007	7	3	1 duty officer; collateral duty
2008	7	3	1 duty officer; collateral duty
2009	7	4	1 officer in training; 1 full time officer
2010	36	3	2 full time officers
2011	12	16	2 full time officers
2012	4	34	2 full time officers; Manatee Protection Rule, Kings Bay, established 03/2012
2013	136	22	2 full time officers; more efficient warnings reporting system implemented
2014	377	21	2 full time officers
Note: *Warnings include instances where the officer observes a person or group violating a prohibition, makes contact with that person or group, and provides corrective direction.			

The National Wildlife Refuge System Administration Act of 1966 and the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act), encourages national wildlife refuges to provide for compatible wildlife-dependent recreation and requires national wildlife refuges to manage for the conservation of fish, wildlife, and habitat for present and future generations of Americans. The Crystal River NWR has been monitoring and documenting the recreational use of the 0.92-acre Springs and has determined that the numbers and types of recreational uses and visitors to the area may be potentially affecting the natural movements, behaviors, and interactions of the endangered Florida manatee.

Therefore, the USFWS has determined that, in order to meet its legal mandates under federal law and fulfill its management agreement with owners of the Springs property, the Refuge is proposing management actions to limit the numbers and types of in-water visitors when manatees are resting or nursing in the Springs.

Recommendations for changes to manatee viewing would only apply to the three springheads located at the Springs within the Crystal River NWR boundaries and the associated spring run during manatee season. Although manatee season is typically defined as November 15 to March 31, major cold fronts have reached Florida prior to and after these prescribed dates extending the season. The USFWS is applying a precautionary approach with regard to seasonal definitions, to minimize the potential effects of combined cold stress syndrome with potential disturbance on endangered Florida manatees. A precautionary approach recognizes that, in cases of threats to ecosystems, scientific uncertainty should not be used as a reason to postpone preventive measures. Under such conditions, manatee season may be extended to November 1 through April 15.

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Additionally, the Springs are suffering from bank erosion, causing tree falls, and overall habitat degradation for manatees. In some cases, nearly the entire rooting structure is exposed, with little or no connection to the banks; some severely undercut banks have extreme bank angles extending more than 4 feet under the bank. Other areas, particularly along the southern reach of the Springs, show evidence of historical tree and root collapse and subsequent removal. Manatees are observed to browse along the banks, likely degrading bank stability (Herrington 2012). Therefore, shoreline engineering for bank stabilization is needed to safeguard the very integrity of this vital manatee winter habitat.

## **Refuge Legal Framework**

The 57.1-acre Three Sisters Springs property was purchased through a partnership effort in July 2010. This partnership included a grant from the Florida Communities Trust to the City of Crystal River; funding through Citrus County and the Citrus County Tourist Development Council; private donations from the Felburn Foundation, the Friends of Crystal River NWR Complex, National Wildlife Refuge Association, Save the Manatee Club, other environmental organizations, civic clubs, and individuals; Florida Forever funding through the SWFWMD; and federal funding from Congress. Federal (\$3 million) and Felburn Foundation (\$2.7 million) funding was used to retire the water rights for the Springs by purchasing the Consumptive Use Permit that was in effect for the property. The USFWS manages the property under a lease agreement with the City of Crystal River and SWFWMD. The property is 70 percent owned by the City of Crystal River and 30 percent by the SWFWMD. The Refuge manages the area under the Three Sisters Springs Management Agreement (Agreement) with the City of Crystal River and the SWFWMD.

### *Legal Authorities and Mandates*

The management of individual National Wildlife Refuge System (NWRS) units is dictated, in large part, by the legislation, Executive Order, or administrative action that creates the unit. The Refuge purpose(s) reflected in enabling legislation, Executive Orders, and administrative actions may range from narrow to broad.

Crystal River NWR was administratively authorized by the Director of the USFWS on January 10, 1983, to conserve threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the Florida subspecies (*Trichechus manatus latirostris*).

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species.” 16 U.S.C. 1534 (ESA).

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 U.S.C. 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 U.S.C. 460k-2 (Refuge Recreation Act, 16 U.S.C. 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 U.S.C. 3901 (B) 100 Stat.3583 (Emergency Wetlands Resources Act of 1986).

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Operation and management of national wildlife refuges are also influenced by a wide array of other laws, treaties, and Executive Orders pertaining to the conservation and protection of natural and cultural resources. Among the most important orders and laws affecting the operation and management of Crystal River NWR are the Improvement Act, the Refuge Recreation Act, the ESA, MMPA of 1972, and the Fish and Wildlife Coordination Act. Other key considerations are:

**The National Wildlife Refuge System Administration Act** serves as the "organic act" for the NWRS. The National Wildlife Refuge System Administration Act consolidated the various categories of lands administered by the Secretary of the Interior (Secretary) through the USFWS into a single NWRS.

**The Refuge Improvement Act** establishes a unifying mission for the NWRS, a process for determining compatible uses of refuges, and a requirement for preparing comprehensive conservation plans. The Refuge Improvement Act states that first and foremost that the mission of the NWRS be focused singularly on wildlife conservation. The Act identified six priority wildlife-dependent recreation uses, clarified the Secretary's authority to accept donations of money for land acquisition, and placed restrictions on the transfer, exchange, or other disposal of lands within the Refuge System. Additionally, the Act reinforces and expands the "compatibility standard" of the Refuge Recreation Act. The Improvement Act authorizes the Secretary, under such regulations as s/he may prescribe, to "permit the use of any area within the System for any purpose, including but not limited to hunting, fishing, public recreation and accommodations, and access whenever s/he determines that such uses are compatible with the major purposes for which such areas were established"..

*Refuge Regulations-Code of Federal Regulations (CFR)*

**50 CFR §25.21 (e)** states, with respect to the Springs, "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, the Refuge Manager may close or curtail Refuge uses of all or any part of an opened area to public access and use in accordance with the provisions in 25.31, without advance notice".

**50 CFR §17.108** The Springs were included in the Kings Bay Manatee Protection Area Rule which expanded temporary no-entry areas in 2012. This allows the USFWS to restrict waterborne activities including, but not limited to, swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing, and the use of water vehicles (including boats, personal watercraft, and other vehicles used to move across or underneath the water's surface).

**The Refuge Recreation Act** or "the Recreation Act" requires that any recreational use on areas of the NWRS be "compatible" with the primary purpose(s) for which the area was acquired or established. The Recreation Act also requires that sufficient funding be available for the development, operation, and maintenance of recreational uses that are not directly related to the area's primary purpose(s).

**The Endangered Species Act of 1973 (ESA)**, as amended directs federal agencies, under section 7(a) (1) of the ESA, to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Conservation of threatened and endangered species has become a major objective of both land acquisition and Refuge management programs.

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**The Marine Mammal Protection Act of 1972 (MMPA.)** prohibits the ‘take’ (i.e., hunting, killing, capture, or harassment) of marine mammals, and enacts a moratorium on the import, export, and sale of marine mammal parts and products. The MMPA established federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otters, walrus, polar bears, dugongs, and manatees. Authority to manage marine mammals was divided between the Department of the Interior (delegated to USFWS) and the Department of Commerce (delegated to the National Oceanic and Atmospheric Administration’s [NOAA’s] National Marine Fisheries Service [NOAA Fisheries]). A third Federal agency, the Marine Mammal Commission, was later established to review and make recommendations on the policies and actions of the USFWS and NOAA Fisheries related to their implementation of the MMPA.

*Agreements and Plans*

**The Declaration of Restrictive Covenants** is an agreement entered into between the Florida Communities Trust, a non-regulatory agency within the Florida Department of Environmental Protection (DEP), and the City of Crystal River. The intent of the agreement is to impose the terms and conditions on the use of the proceeds of certain bonds and the lands acquired with such proceeds (the Springs). This agreement is necessary to ensure compliance with the applicable Florida law and federal income tax law and to otherwise implement the provisions of Sections 259.105, 259.1051, and Chapter 380, Part III, Florida Statutes. The Declaration of Restrictive Covenants outlines that the Springs are to be managed for conservation, protection, and enhancement of natural and historical resources and for compatible passive, natural resource-based public outdoor recreation, along with other related uses necessary for the accomplishment of this purpose.

**Management Agreement for Certain Lands Located Within the City of Crystal River, Citrus County, State of Florida.**

The USFWS manages the property under a management agreement with the City of Crystal River and the SWFWMD. The property is 70 percent owned by the City and 30 percent by the SWFWMD. The Agreement outlines how Crystal River NWR will manage the Springs for the conservation, protection, and enhancement of natural resources. The area is managed by Crystal River NWR as an extension of the Refuge in accordance with: 1) the Three Sisters Springs Project Management Plan; 2) the National Wildlife Refuge System Administration Act of 1966; 3) the Improvement Act; 4) other acts of general applicability to the NWRS; 5) Title 50 of the Code of Federal Regulations (including the Kings Bay Manatee Protection Area Rule); and 6) Florida laws and regulations. Within the authority of the Improvement Act and the Agreement, the USFWS is encouraged to keep the Springs open to compatible public recreation, maintaining and sustaining quality visitor experiences while at the same time providing adequate protection for manatees, thus balancing the use of manatees and visitors. The Agreement’s duration is for 25 years and provides for two automatic 25-year extensions.

**Three Sisters Springs Project Management Plan**

In accordance with the terms of the Florida Communities Trust Grant, the City of Crystal River has, in conjunction with the USFWS and SWFWMD, developed a Management Plan to ensure that the project site will be developed in accordance with the Agreement and within the law. The Management Plan describes the ultimate development of a nature discovery area, a nature trail, at least one picnic pavilion, a fishing dock, and a boardwalk adjacent to the Springs. The project site would be managed for the conservation, protection, and enhancement of natural resources (including manatees), and for compatible outdoor recreation.

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All proposed action alternatives would comply with the National Environmental Policy Act (NEPA) and all additional legal agreements, authorities, mandates, legislation, and regulations and are consistent with the USFWS's Florida Manatee Recovery Plan (USFWS 2001), FWC's Florida Manatee Management Plan (FWC 2007), and the USFWS's status review of the West Indian manatee (USFWS 2007; Ecological Services review, in prep.).

### **C. BACKGROUND**

The general management objectives for Crystal River NWR are:

- To provide habitat and protection for the Florida manatee consistent with the requirements of the ESA, the MMPA, and the Florida Manatee Sanctuary Act;
- To foster a sense of public commitment and understanding toward the plight of the manatee and the need for protection by providing opportunities for environmental education, interpretation, and compatible wildlife-oriented recreation;
- To support the USFWS's commitment to implement and carry out the objectives of the Florida Manatee Recovery Plan (USFWS 2001); and
- To provide habitat for a natural diversity of wildlife species.

### **D. COORDINATION AND CONSULTATION**

The USFWS has discussed concerns and possible solutions needed to address potential manatee disturbance in Three Sisters Springs with many of its stakeholders over the past several years. Concerns related to the potential disturbance of manatees by crowding from in-water visitors have been the focus of numerous discussions. Proposals were coordinated with all interested and/or affected parties including: the City of Crystal River; SWFWMD; FWC; USGS manatee researchers; local stakeholders; community groups; and national and local non-government organizations, as well as, the USFWS Regional Archaeologist who coordinated with Tribes and the State Historic Preservation Office.

### **E. PUBLIC INVOLVEMENT**

On August 5, 2015, the USFWS announced the availability of a Draft EA for the Three Sisters Springs Unit of the Crystal River NWR: Aquatic Habitat and Wildlife-Viewing Improvements. A 30-day public comment period was provided, to which the USFWS received approximately 2,600 written public comments. Public participation was also available during two public meetings held on August 11 and 12, 2015. Comments were received from State and Federal agencies as well as from individuals, conservation organizations, tour operators, and other stakeholders. During the first public comment period, substantive comments were received and are included in Appendix A. Comments received on this document will be evaluated and responded to in Appendix A.

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## *II. Affected Environment*

### Human Environment

Three Sisters Springs is a confined spring basin that provides visitors with some of the clearest water in Kings Bay. It is also the only spring complex in Kings Bay that is entirely surrounded by native hardwood vegetation, making it the most appealing and naturally aesthetic of all the springs in Kings Bay. The Springs are the most visited spring complex in Citrus County by snorkelers, paddlers, and land-based visitors. Additionally, the Springs are the most visited springs by commercial tour operators and outfitters in Citrus County, year-round. Currently, the Springs are collectively the only confined, clear-water spring site where people are allowed to recreate, in-water, with manatees during the winter months. All confined springs under state ownership/management in Florida (Ellie Schiller Homosassa Springs Wildlife State Park, Manatee Springs State Park, and Blue Spring State Park) are closed to public, in-water access during the winter when manatees are present.

A suite of recreational and commercial activities associated with the Springs, during the winter, contributes to the local economy. Recreational activities known to occur in the Springs include paddlecraft recreation (kayak, paddleboard, and canoe) and snorkeling. Specific wildlife-dependent activities in the Springs include guided ecotourism, manatee viewing, wildlife photography, and nature interpretation. Commercial activities include guided snorkeling tours, guided paddlecraft tours, commercial photography and filming, and summer commercial scuba diving and instructing. A total of 27 local dive shops/tour operators conduct commercial guided snorkeling operations at the Springs year-round, while another 10 outfitter companies rent paddlecraft to visitors or guide visitors in paddlecrafts year-round. A total of 136,738 year-round visitors was reported in 2014 by 37 tour operators, all under a commercial SUP issued by the USFWS. The guided commercial uses of the Springs by commercial SUP holders are higher during tourist season, e.g., November 2013 – April 2014 winter months (53,520 visitors reported) compared to the May 2014 – October 2014 summer months (38,688 visitors reported). Boat rental customer totals are almost identical between summer months (21,846) and winter months (21,699). The ratio of the 2014 guided to rental visitors (customers) is 2:1 (93,552 to 43,186 visitors).

Between May and October, most visitors use the Springs to swim recreationally (without snorkel gear), while a minority of visitors are guided visitors who use snorkel gear and wetsuits (USFWS Public Use Survey Study 2009 – 2014). Most summer visitors in private, guided, and rental paddlecraft exit their vessels to swim in the Springs. Most winter visitors in private, guided, and rental paddlecraft do not exit their vessels to swim in the Springs. The vast majority of visitors (swimmers and paddlers) in the Springs between May and October are unguided, while the vast majority of visitors (swimmers and paddlers) in the Springs between November and April are guided (USFWS Public Use Survey Study 2009 – 2014). Currently, some visitors accessing the Springs via paddlecraft bring pets, especially dogs, into the Springs.

An average of 10 film crews and 30 professional photographers apply for permits yearly to film/photograph manatees underwater, in the Springs. The film crews consist of national and international television media corporations, typically working on documentary films about manatees and the Springs. Professional photographers applying for permits mainly consist of freelancers, either working under a contract for print or electronic media including magazines, newspapers, blogs, social media, and websites, or looking to sell their photos individually or to stock agencies (Commercial SUP Visitors Reports 2013 and 2014 for Crystal River NWR).

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## Biological Environment

The warm water springs located at the Three Sisters Springs have been classified by the State of Florida as a second-order spring system, discharging from 10 to 100 cubic feet of water per second, with three primary spring boils with interconnected pools. The springheads are situated in a small, entirely confined area. The three springheads and interconnected pools are less than one acre in size, have an average depth of 6 feet, and are completely surrounded by a vegetated shoreline. Access to the Springs is through a narrow, 5 foot wide, 165 foot long water outfall or spring run. The spring run discharges into a dredged, residential canal system which leads into Kings Bay and eventually to Crystal River that flows into the Gulf of Mexico (Herrington 2012).

A variety of wildlife species may be found in the Springs and surroundings. The Florida manatee (*Trichechus manatus*), Florida sandhill crane (*Grus canadensis pratensis*), Southeastern American kestrel (*Falco sparverius paulus*), and wood stork (*Mycteria americana*) use the site and are species with state or federal status/designations. Endangered and/or threatened species known or likely to occur at the Springs are listed in Table 3.

Vegetation in the Springs and spring run consists of sparse submerged aquatic vegetation and aquatic algae covering limestone outcroppings. Several trees overhang the pool, in some cases with nearly the entire root structure exposed with little or no connection to the pool banks. Tree species surrounding the Springs include red maple (*Acer rubrum*), black cherry (*Prunus serotina*), sweetgum (*Liquidambar styraciflua*), red cedar (*Juniperus silicicola*), American elm (*Ulmus americana*), sweet bay (*Magnolia virginiana*), and pop ash (*Fraxinus caroliniana*). Additional species include sugarberry (*Celtis laevigata*), wild coffee (*Psychotria nervosa*), live oak (*Quercus virginiana*), laurel oak (*Q. laurifolia*), water oak (*Q. nigra*), and white basswood (*Tilia americana* var. *heterophylla*). Additional trees were planted in 2014 by the Citrus County Chapter of the Florida Native Plant Society and are included in the plant list for the Springs (Curtis 2015).

Aquatic species commonly found in the Springs include blue crabs (*Callinectes sapidus*), bluegills (*Lepomis macrochirus*), bowfin (*Amia calva*), largemouth bass (*Micropterus salmoides*), needlefish (*Strongylura* sp.), mangrove snapper (*Lutjanus griseus*), mullet (*Mugil cephalus*), and snapping turtles (*Chelydra serpentina*).

Bank erosion within the Springs is causing tree falls and overall habitat degradation for manatees. Several areas exist where trees that are currently susceptible to collapse overhang the water. As banks erode and trees collapse into the Springs, they take up space needed and used by resting manatees. In some cases, nearly the entire root structure is exposed with little or no connection to the banks; some with severely undercut banks. Areas, particularly along the southern reach of the Springs, show evidence of historical tree and root collapse and subsequent removal. Manatees are also observed to rub along the banks, likely degrading bank stability (Herrington 2012).

Table 3. Federal and State Listed Species Known or Likely to Occur In or Around the Springs.

Scientific Name	Common Name	Agency Status	
		FFWCC	USFWS NOAA Fisheries
<b>Mammals</b>			
<i>Trichechus manatus latirostris</i>	Florida Manatee	FE	E
<b>Birds</b>			
<i>Egretta caerulea</i>	Little Blue Heron	SSC	-
<i>Egretta rufescens</i>	Reddish Egret	SSC	-
<i>Egretta thula</i>	Snowy Egret	SSC	-
<i>Egretta tricolor</i>	Tricolored Heron	SSC	-
<i>Eudocimus albus</i>	White Ibis	SSC	-
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	ST	-
<i>Grus canadensis pratensis</i>	Florida Sandhill Crane	ST	-
<i>Mycteria americana</i>	Wood Stork	FT	T
<i>Pelecanus occidentalis carolinensis</i>	Eastern Brown Pelican	SSC	-
<b>Reptiles</b>			
<i>Alligator mississippiensis</i>	American Alligator	T(S/A)	T(S/A)
<i>Drymarchon couperi</i>	Eastern Indigo Snake	FT	T
<i>Macrolemys temminckii</i>	Alligator Snapping Turtle	SSC	-
<p>Federal Designations:  E = Endangered, T = Threatened, T(S/A) = listed due to similarity in appearance of American crocodile, a threatened species.</p> <p>State Designations (FWC 2015): FE = Federally Endangered, FT = Federally Threatened, T(S/A) = Threatened b/c Similarity of Appearance, ST = State Threatened, SSC = State Species of Special Concern.</p>			



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## Cultural Environment

Reviews of the Southeast Region and Florida Master Site File databases revealed that no historic properties had been documented or recorded on the Three Sisters Springs Tract. In July 2014, the Service consulted with the Florida Division of Historical Resources (FDHR), the Seminole Tribe of Florida, the Miccosukee Indian Tribe of Florida, the Seminole Nation of Oklahoma, the Muscogee (Creek) Nation, and the Poarch Band of Creeks concerning proposed public use infrastructure projects on the uplands adjacent to the Springs. Kanaski's 2014 cultural resource assessment concluded that much, if not all, of the tract had been substantially disturbed by past construction of the encompassing canal system and the associated site preparations for development of a residential subdivision. The tract and surrounding area were transformed from a mesic or hydric hammock to a filled-in forested wetland with a man-made lake. The potential for intact archaeological sites on the tract, as well as in the Springs and man-made canal, is considered to be very low. FDHR concurred with this finding in their response dated August 13, 2013.

## Physical Environment

The current physical environment, within the scope of this EA, is comprised of the Springs' basin and banks, spring run, and the surrounding boardwalk. In addition, along the banks are several informational Refuge signs. Associated with the immediate physical environment, but falling outside the scope of this EA, would be a graveled parking lot and temporary bathrooms, both adjacent to the boardwalk, to accommodate visitors.

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### *III. Alternatives*

#### **Alternatives Formulation**

Development of alternatives for the proposed action in the Springs entailed consideration of four key variables: (1) increasing manatee usage of the Springs; (2) federal regulations prohibiting the take of manatees, including the ESA and MMPA; (3) Improvement Act; and (4) public use and community concerns.

#### *Current Manatee Usage of Three Sisters Springs*

The Springs provide a primary winter resting area for the endangered Florida manatees in northwest Florida, a region that supports approximately 17 percent of the entire population of this subspecies. The manatee population in Citrus County has steadily increased over the past decades, reaching a high of 1,016 manatees during the winter of 2014-2015. As many as 706 manatees have been recorded using the confined, shallow, warm water springs in Kings Bay with 446 in Three Sisters Springs (Table 1). Additionally, large numbers of recreational snorkelers and paddlecraft have also been recorded using the same confined, shallow, warm water in the Springs that is manatee habitat; their number has increased to over 60,000 per season (Commercial SUP Visitors Reports 2014 for Crystal River NWR).

#### *Federal Regulations Prohibiting the Take of Manatees*

The USFWS 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 current ESA and MMPA regulations, citing and prosecuting violators who engage in activities known to take manatees, including violators who harass or disturb manatees while engaged in viewing activities. Pursuant to the USFWS's implementing regulations as defined 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. Within the Springs, common manatee behaviors include feeding of young by nursing, and sheltering to rest in the warm waters. 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.

#### **Alternatives Considered**

The alternatives here maintain the same identifying letters and sequence presented in the earlier Draft EA. Based on information received during the public and peer review period, we have adopted an additional, Proposed Alternative, Alternative D, through modification of Alternative C.

#### **FEATURES COMMON TO ALL ALTERNATIVES**

The following management measures and prohibitions are included in each alternative:

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- Enforce the current Twelve Prohibitions. The Twelve Prohibitions are illegal forms of interacting with manatees as prescribed in the Kings Bay Manatee Protection Area Rule. They are:
    1. No chasing or pursuing of a manatee(s).
    2. No cornering or surrounding of a manatee(s).
    3. No poking, prodding, or stabbing of a manatee(s).
    4. No feeding of a manatee(s).
    5. No riding or holding of a manatee(s).
    6. No grabbing or pinching of a manatee(s).
    7. No disturbing or touching of a resting manatee(s).
    8. No diving on a resting or feeding manatee(s).
    9. No separating of a manatee(s) mother and calf(s).
    10. No actively engaging of a tagged manatee(s) or associated gear.
    11. No entering of manatee sanctuaries.
    12. No standing on a manatee(s).
  
  - Promote public and visitor education regarding 'Passive Observation' via 'Manatee Manners' outreach materials.
  
  - Provide wildlife and nature interpretation and public education via seasonal, professional nature interpreters on the boardwalk.
  
  - Prohibit entering the Springs between official sunset and official sunrise.
  
  - Prohibit scuba diving.
  
  - Prohibit fishing including, but not limited to, fishing by hook and line, by cast net, or by spear.
  
  - Continue federal and state law enforcement efforts to cite and prosecute disturbance and harassment of manatees under 50 CFR §17.3 and §18.3, the ESA and the MMPA.
  
  - Continue to actively engage visitors and the community via outreach and communication partnerships with local stakeholders and institutions in manatee conservation efforts.
  
  - Support SWFWMD's bioengineering project:

This project would stabilize vulnerable shorelines from current and future erosion by backfilling undercuts with geotextile bags filled with soil, facilitating root growth of existing vegetation, and stabilizing the undercut shoreline. Large limestone rocks would also be used to reinforce and protect both the geotextile bags and the shoreline from further eroding and undercutting. Bank stabilization would ensure the continued existence of the surrounding vegetation and ensure that the Springs remain habitat for manatees. Bank stabilization would incorporate bioengineering techniques, providing a biologically appropriate and safe environment for manatees and the visiting public. The SWFWMD will be conducting this work under a FWS permit so the impacts of this project will be analyzed in this EA. The SWFWMD has coordinated this effort with the Florida Department of Environmental Protection and the US Army Corps of Engineers.

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## **ALTERNATIVE A – NO ACTION**

The No Action Alternative maintains existing management measures within the Springs and the spring run during manatee season, but does not provide any additional measures. The Springs would continue to be evaluated daily during manatee season. Opening or closing the Springs to in-water, recreational access would occur in response to estimated or actual manatee numbers in/around the Springs and consideration of key environmental factors (i.e., actual or estimated manatee numbers from counts in the Springs, the spring run, and areas at the mouth of the run, tide heights measured within the Springs, ambient sea water temperatures from the Shell Island USGS weather monitoring station, and ambient water temperatures from the canal entrance to the spring run).

## **FEATURES COMMON TO ALTERNATIVES B, C, AND D**

The following management measures and prohibitions are included in each action alternative (Alternatives B, C and D):

- Improve existing boardwalks to comply with Americans with Disabilities Act (ADA) and public safety standards for improved views of the Springs, wildlife viewing, and recreational photography. For public safety, the boardwalk would be reengineered with non-slip materials such as composite lumber decking with a high friction coefficient. Additionally, a smooth composite lumber material would be used for a guardrail system.
- Prohibit pets on the boardwalk, shoreline, or in the water at the Springs and the spring run. Pets may carry communicable diseases that could adversely affect visitors and manatees (Bossart et al. 2012).
- Provide additional interpreters on the boardwalk for public education.
- Construct an ADA-compliant elevated viewing platform (Figure 8) to allow for improved views of the Springs, wildlife viewing, and recreational photography, such that:

Modifying the current boardwalk around the Spring would provide wildlife viewing opportunities for mobility-impaired visitors by incorporating two elevated observation platforms on the southwestern side of the Springs' boardwalk. Mobility impaired visitors would have a heightened view to observe manatees in and around Deep Sister spring and an improved viewshed for all visitors. The first ADA-compliant observation platform would be approximately 9.5 feet high and 6 feet wide, with a maximum of 1:12 sloping ramp leading from the current boardwalk to the platform. The second platform would be approximately 14 feet high and 12 feet wide, with steps leading up from the ADA-compliant platform. Both of these additional viewing platforms would be below the mid-story tree canopy (approximately 22 feet) and below the over-story tree canopy (approximately 50 feet), thereby maintaining the aesthetics of the site.

## **ALTERNATIVE B – MANATEE VIEWING FROM LAND ONLY**

The following management measures would be implemented under Alternative B:

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- Prohibit all in-water access (swimming, snorkeling, paddlecraft, etc.) to the Springs and provide access to the Springs for manatee viewing, nature interpretation, and public education from ADA-compliant boardwalks and elevated viewing platform(s) only.



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## ALTERNATIVE C – GUIDED IN-WATER MANATEE VIEWING

The following management measures would be implemented under Alternative C:

- All in-water access to the Springs via the narrow spring run will be closed, during manatee season (November 15 to March 31), and designated closures may be made prior to November 15 and after March 31 during cold fronts when manatees are present. The public would be notified of emergency closures through the Refuge's main phone number, homepage, Facebook page, news releases, and posting of flyers.
- USFWS-certified guides (hereafter referred to as "guides") would be required to accompany and supervise visitors during in-water tours and the Refuge would standardize guide certification for the Springs, during manatee season, such that:
  - In-water, guided manatee viewing would be available during the hours of 9AM and 4PM daily, except during emergency closures.
  - All guides would be required to attend an in-water guide training to become certified (only certified guides would be allowed to accompany snorkelers in the Springs). Refuge personnel would lead these training sessions.
  - Upon entering the property, SUP commercial guides and their snorkelers would have access to a commercial operator designated parking lot, an ADA-accessible floating dock located on the northeast side of Deep Sister spring, portable toilets, a staging area complete with limited seating, and a small changing room structure attached to the boardwalk. In addition, snorkelers would have access to the boardwalk, trails, and other amenities while under the guidance of the SUP commercial operator should a snorkeler decide to leave the water before the end of his/her guided experience.
- The number of SUPs for the use of any type of flash photography inside the Springs will be limited. SUPs for diffused flash photography would be issued for educational or research purposes only, such that:
  - A limited number of commercial photographers and videographers would be provided access during the manatee viewing season. In-water access would be available from 8AM to 5PM (providing one hour earlier and later access than is otherwise provided to allow for optimal light and water clarity conditions for photography) on Monday, Tuesday, Wednesday, and Thursday. On Friday, Saturday, and Sunday access would be provided from 10AM to 4PM.
  - The number of commercial photographer and commercial videographer SUP holders in the Springs at any one time would be limited to a number of two or less (the Refuge would reserve the right to reduce these numbers depending on monitoring results).
  - A lottery-style system will be implemented which would require commercial photographers and filming companies/videographers to submit an application, during the open application season, to operate in the Springs. Permits, using current fee structures would be issued for an one-week period maximum and applicants would be able to request a maximum of two weeks per viewing season, except during the month of January (peak photographing and filming season) when applicants would be limited to an one-week period.

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- The SUP conditions for commercial wildlife observation guides using the Springs will require the following specific stipulations: a City of Crystal River business license or exemption letter from the City of Crystal River and in-water liability insurance covering their snorkelers.
  - As necessary, close two lobes (Pretty Sister and Little Sister) to in-water access during manatee season, in response to key environmental factors (i.e., actual or estimated manatee numbers from counts in the Springs, the spring run, and areas at the mouth of the run, tide heights measured within the Springs, ambient sea water temperatures from the Shell Island USGS weather monitoring station, and ambient water temperatures from the canal entrance to the spring run (less than 68° F) or at the discretion of Refuge management (Figure 9). The closed areas will be designated by a heavy-duty chain laid in a line across the bottom of the springs with multiple sections of PVC pipe marked "Manatee Resting Area-Closed Area" slid over the chain. This set-up will be used along both lobe closure lines (by the middle spring and the east spring) and secured underwater to sign posts marked as "Closed Area".
  - Institute and enforce conduct of SUP holders, guides, and snorkelers that supports and promotes responsible, sustainable wildlife-viewing and ecotourism.
  - Provide in-water access to up to 20 snorkelers and the associated 5 guides and 2 photographers and the associated two guides as well as six refuge staff or designees from an ADA-compliant floating dock and ramp attached to the improved boardwalk (Figure 9 and Figure 10), such that:
    - SUP holders and their snorkelers conducting permitted activities limited to guided snorkeling, guided commercial photography, guided commercial filming, and permitted specific purposes (up to 6 individuals) would constitute the entirety of in-water activities in the Springs during manatee season. The specific purposes that the Refuge may issue a SUP include: research, manatee rescue, and educational purposes after careful review of the proposed actions and their possible impacts on manatees.
    - The number of SUPs is limited to five or less, and each permit would place limits on the number of snorkelers in the Springs at any one time to four or less per SUP per allotted time in the Springs, with one guide supervising snorkelers at a ratio of one guide:four snorkelers.
    - The number of SUPs to be allotted was determined by considering a conservative estimate of the total number of snorkelers and guides that may be in the Springs at any one time while prioritizing the non-disturbance of resting and nursing manatees. The number of snorkelers was calculated by estimating the total surface area of open water of the Springs (between the two closed lobes) and designating approximately  $\frac{1}{4}$  of the surface area for recreational wildlife viewing activity and  $\frac{3}{4}$  of the surface area for unimpeded manatee use. The open water surface area is estimated to be 16,335 square feet. It is assumed that each person would take up an estimated 144 square feet. Given 5 guides and 20 visitors plus two photographers, each with a guide, the total people in the Springs at any given time would be 29. Multiplying the maximum number of people (29) by the square feet of interaction distance (144 square feet) yields a total allotted surface area usage of 4,176 square feet for recreational wildlife viewing. This leaves an aggregate remainder of 12,159 square feet of surface area for
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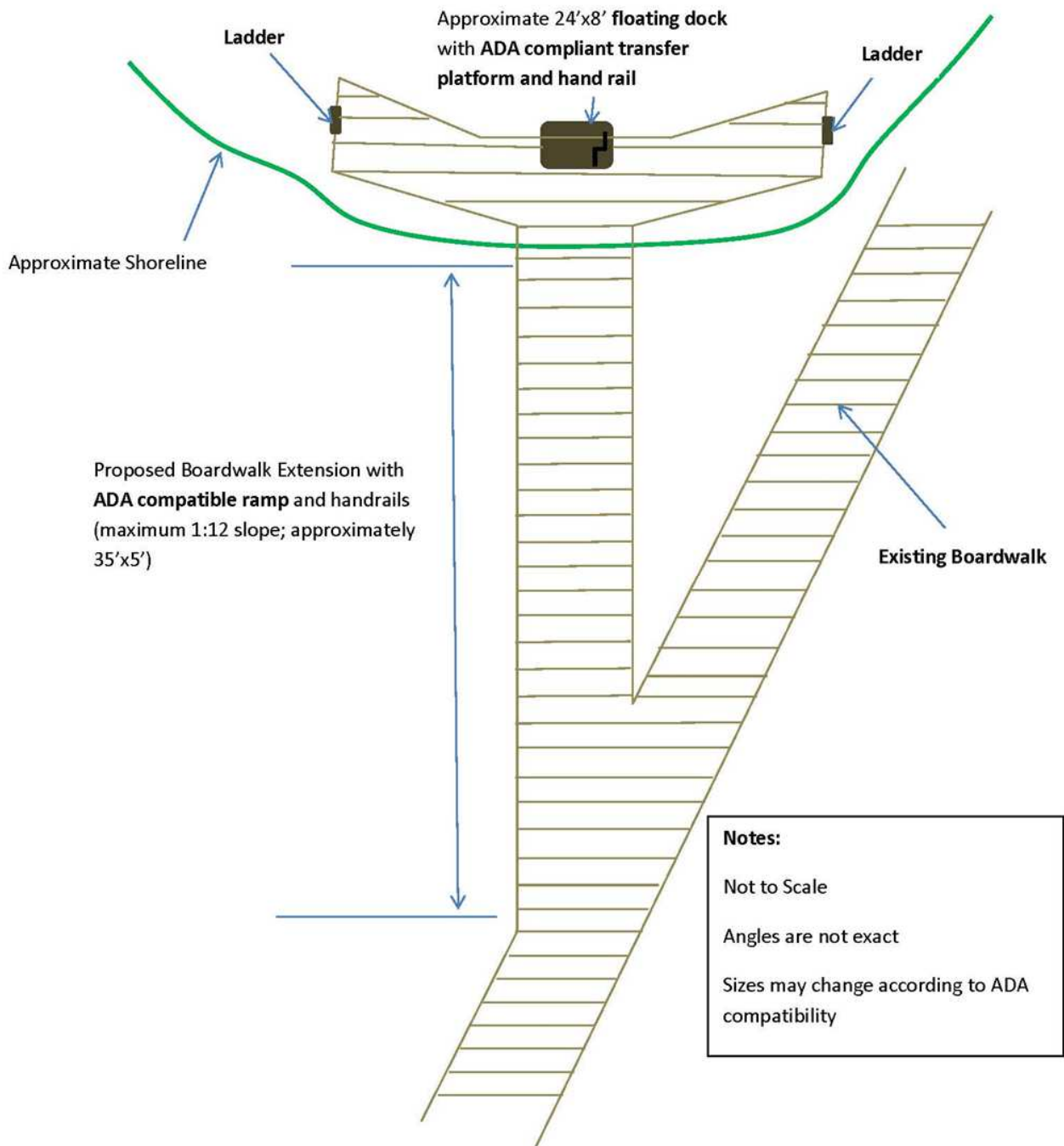
manatees to traverse, surface to breath, rest or nurse their calves undisturbed in the open recreational wildlife viewing area.

- The maximum number of permissible guides at any one time in the Springs is seven. Given that each of those guides may escort up to 4 snorkelers or one photographer, a back calculation reveals a total potential for five or less SUPs holders operating in the Springs.
- Manatee behavior and human interactions would be monitored and the number of SUPs and snorkelers may be reduced based on the Refuge's monitoring plan. The Refuge would evaluate the effect of the number of snorkelers to the Springs and may reduce the number of snorkelers accordingly. Applicants would be reminded, prior to issuance of a SUP, that the Refuge reserves the right to implement emergency closures of the Springs, and that such closures may occur at any time to safeguard the health of manatees or for public safety.
- The USFWS reserves the right to reduce the number of snorkelers in the water on a case-by-case basis, in consultation with the SWFWMD and the City of Crystal River.
- The administrative fee is proposed to be a one-time charge at the time the SUP is issued. The fee would range from \$970.00 to \$1,200.00 and is dependent upon the number of permits issued and the in-water access amenity fee which is proposed to be \$10 per snorkeler per day. The SUP would be an annual renewable permit. The administrative costs were determined to partially recoup the cost of managing and administering the program which includes one seasonal recreational technician, 8 percent of the salary for the visitor services specialist to complete training and issue permits, 25 percent of the salary for a maintenance worker, and maintenance costs for the boardwalk, restrooms, and other visitor amenities.
- In order to facilitate manatee ingress and egress through the spring run without disturbance, an ADA-compatible ramp and floating dock would be provided for in-water wildlife viewing in the Springs during manatee season. The ramp would be connected to the northeast side of the improved boardwalk with a maximum of 1:12 slope (approximately 35 feet x 5 feet) and connect to a floating dock along the eastern edge of Deep Sister. A gangway would connect the ramp to a floating dock. The floating dock would be approximately 24 feet x 8 feet and consists of a transfer platform with safety launch and hand rail (overhead assist bar) to allow for mobility impaired snorkelers to access the Springs. The dock would also have ladders on each end to provide ingress and egress by snorkelers. In order to maintain the aesthetics of the Springs, the ramp and dock would be made of PVC decking of natural wood color. The aluminum gangway would also be customized to match the natural wood color (Figure 10). All dimensions would comply with ADA regulations.

Figure 9. Alternative C- Proposed preliminary plan for ADA-compliant ramp, floating dock, elevated viewing platform(s), and spring run and lobe closures during manatee season.



Figure 10. Concept for proposed ADA-compliant ramp and floating dock, Alternative C.



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## **ALTERNATIVE D – MODIFIED GUIDED IN-WATER MANATEE VIEWING**

This alternative was formulated as the result of public, stakeholder, partner, and peer review comments received. Alternative D includes modifications and clarifications to the measures described in Alternative C. Over 2,600 public comments were considered, including those which supported Alternatives A, B, and C and which informed the proposed management measures in Alternative D (Appendix B, Intra-Service Section 7 Biological Evaluation).

The following management measures from previously proposed Alternative C are included in Alternative D:

- Guides would be required to accompany and supervise snorkelers during in-water tours and the Refuge would standardize guide certification for the Springs, during manatee season, such that:
    - In-water, guided manatee viewing would be available during the hours of 9AM and 4PM daily, except during emergency closures. The public would be notified of emergency closures through the Refuge's main phone number, homepage, Facebook page, news releases, and posting of flyers.
    - All in-water guides would be required to attend an in-water guide training to become certified (only certified guides would be allowed to accompany snorkelers in the Springs). Refuge personnel would lead these training sessions.
  - The number of SUPs will be limited for the use of any type of flash photography inside the Springs. SUPs for diffused flash photography would be issued for educational or research purposes only, such that:
    - A limited number of commercial photographers and videographers would be provided access during the manatee viewing season. In-water access would be available from 8AM to 5PM (providing one hour earlier and later access than is otherwise provided to allow for optimal light and water clarity conditions for photography) on Monday, Tuesday, Wednesday, and Thursday. On Friday, Saturday, and Sunday access would be provided from 10AM to 4PM.
    - The number of commercial photographer and commercial videographer permit holders in the Springs at any one time would be limited to a number of two or less (the Refuge would reserve the right to reduce this numbers depending on monitoring results).
  - As necessary, close two lobes (Pretty Sister and Little Sister) to in-water access during manatee season, in response to key environmental factors (i.e., actual or estimated manatee numbers from counts in the Springs, the spring run, and areas at the mouth of the run, tide heights measured within the Springs, ambient sea water temperatures from the Shell Island USGS weather monitoring station, and ambient water temperatures from the canal entrance to the spring run (less than 68° F) or at the discretion of Refuge management (Figure 9). The closed areas will be designated by a heavy-duty chain laid in a line across the bottom of the springs with multiple sections of PVC pipe marked "Manatee Resting Area-Closed Area" slid over the chain. This set-up will be used along both lobe closure lines (by the middle spring and the east spring) and secured underwater to sign posts marked as "Closed Area".
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- Institute and enforce conduct of SUP holders, guides, and snorkelers that supports and promotes responsible, sustainable wildlife-viewing and ecotourism.

In order to fulfill the USFWS's obligation to protect manatees and respect the Declaration of Restrictive Covenants, and the Management Agreement, the following modifications were made to Alternative C and are now included in Alternative D (Proposed Alternative).

### *Modifications*

This section provides modifications to (previously proposed) Alternative C, which are now included in Alternative D.

- The City of Crystal River, as part owner of the property, would provide services that support appropriate and compatible wildlife-dependent and sustainable public recreational uses which are directly related to the requirements of the Declaration of Restrictive Covenants with the Florida Communities Trust, the Management Agreement, the Three Sisters Springs Project Management Plan, the Refuge's establishing purposes, and the mission of the USFWS.
- The City of Crystal River would serve as the "Municipal Partner" for visitor services and operations at Three Sisters Springs under a single SUP which will be established by a joint Memorandum of Understanding with Crystal River NWR, Florida Communities Trust, and SWFWMD. The City will operate visitor services that provide limited, public recreational access, with assistance from guides and educational interpreters.
- Guided access would be provided to a limited numbers of snorkelers daily, in partnership with the City. Guided manatee viewing would be available during the hours of 9AM and 4PM daily, except during closures.
- The maximum number of snorkelers will be eight. The USFWS determined the number of snorkelers based on public feedback regarding maximum and minimum numbers of snorkelers in the Springs and USFWS conducted in-water simulations. One guide would be required to accompany four snorkelers, bringing the total number of snorkelers in the Springs to 10. This would not include allotted photographers (maximum of 2 individuals plus 1 guide), Refuge staff and/or USFWS-approved SUP holders (up to a maximum of 6 individuals) determined on a case-by-case basis. The maximum total number of individuals in the Springs would be 19 individuals.
- The Refuge, in conjunction with the City, would implement a lottery-style selection system that requires all potential snorkelers to apply through an on-line lottery-selection process for the opportunity to enter the Springs during manatee season. The lottery-selection process would open well before the manatee season. The specifics of the lottery-selection process- would be developed in partnership with the City, such that:
  - The lottery application will include a non-refundable processing fee.
  - Applicants will be selected by random draw before the beginning of manatee season.
  - Successful applicants will have a deadline to submit payment for their permit; permit cost is yet to be determined.
  - Permits will be non-transferable.
  - Permit holders will be assigned a guide and provided a comprehensive manatee awareness/Springs' ecosystem orientation.

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- Permit holders will be allowed to take underwater pictures and/or videos of manatees while floating on the surface of the water only, for their personal and non-commercial use.
  - Entry into the Springs for mobility impaired snorkelers selected through the lottery-selection process will be provided via an ADA-compliant ramp at the southeastern edge of the Springs at the junction of the spring run and Pretty Sister. Entries would only occur when manatees are not present or near the ramp.
  - Entry into the Springs, for SUP access, would be provided via stairs on the north side of Deep Sister adjoining the existing viewing platform (Figure 11).
  - The stairs and ramps would be constructed in the Springs as low-profile structures with only the minimum surface area required. The structures would be as closely configured to the Springs' banks as possible.
  - Guided access to a limited numbers of photographers and videographers would be accomplished via a lottery selection process similar to the in-water snorkeler lottery such that:
    - The Refuge would implement a lottery-selection process for permits and entrance dates to take photographs and/or film manatees in-water in the Springs.
    - The Refuge will require a non-refundable lottery application fee; the fee amount is yet to be determined.
    - Applicants would be selected by random draw before the beginning of manatee season; the process for determining specific access dates and times is yet to be determined.
    - Applicants would have a deadline after being selection to submit payment for their assigned time/date; payment amount is yet to be determined.
    - Permits would be required for any person or activity that involves images captured by submerging below the water's surface.
    - All flash photography would be prohibited inside the Springs unless issued a separate SUP for the specific use of artificial lighting device(s).
    - Permitted photographers/videographers would be required to be accompanied by a guide.
    - Only open portions of the Springs will be accessible through the lottery-selection process.
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Figure 11. Potential Location of Stairs and an ADA-accessible ramp for limited public access.



- A standard of conduct for guides, in-water photographers/videographers, and snorkelers that supports and promotes responsible, sustainable wildlife viewing would be instituted. Non-compliance of these standards of conduct or any special conditions of the issued permits may result in the revocation of the issued permit and restrict the issuance of any future permits to the individual permit holders for any use at the Springs. There would be no appeal process associated with the revocation of permit privileges.

General Standards of Conduct include:

- No disposable, single-use plastic or paper containers or other disposable items.
- No glass bottles.
- No alcoholic beverages.
- No smoking except in designated upland areas.
- No vessels (motorized or non-motorized) including but not limited to motorized, devices, and underwater scooters.

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- No fishing, gigging, spearing, or netting.
  - No loud noises (including but not limited to yelling, screaming, or music), or splashing or diving.
  - No standing on, holding, climbing, or hanging from vegetation.
  - No removal of any plant, animal, mineral, or other natural or cultural resource.
  - All trash and food products must be removed from water and/or property (pack-in pack-out).
  - No food or drink (water) is to be made available to wildlife.
  - No scuba diving.
  - No attaching to or altering of any structures, vegetation, or land; apart from designated mooring(s).
  - No phone or camera extension poles allowed.
  - No exchanging of items or any materials between in water visitors and boardwalk visitors, including throwing, passing, or handing items between visitors.
  - No remote control equipment (boats, UAVs, planes, submarines, cameras).
  - No pets allowed inside Three Sisters Springs or on the boardwalk.
  - No dissemination of non-approved information (advertising, flyers, handouts, etc.).
  - No commerce or solicitation of products or services, unless approved by the Refuge.

#### Snorkeling/Wildlife Viewing Standards of Conduct:

- A guide (certified by the USFWS) must be in-water with snorkelers at all times.
  - The USFWS Three Sisters Springs Guide Certification course must be completed annually.
  - Guides will provide a comprehensive safety, expectations of conduct, and manatee awareness orientation for all snorkelers prior to entering the water.
  - Safety orientation will define water safety industry standards and manatee awareness and expectations of conduct.
  - Orientation will comply with both guide training and USFWS rules and regulations including 'Manatee Manners.'
  - The guide is responsible to ensure their snorkelers can snorkel calmly and efficiently without disturbing manatees or other wildlife.
  - Guide to snorkeler ratio for in-water Refuge activities will be one guide:four or fewer snorkelers.
  - Guides' and snorkelers' equipment including wetsuit, snorkel, snorkel vest, and mask, will be dark in color. Exceptions will be made on a case-by-case basis for individuals with custom gear.
  - Snorkelers may not use fins.
  - Guides may use fins provided they are dark in color.
  - For additional buoyancy, guides and snorkelers may use snorkel vests.  
It is strongly recommended that long hair is bound up or under a dark colored swim cap or dive hood. All children under 16 years old must be supervised by a responsible adult (at least 18years old) at a one adult:one child ratio.
  - Guides and snorkelers may only enter and exit the water at approved, designated locations.
  - Communications between guide and snorkelers will mainly consist of hand signals; and verbal communication will be kept at a minimal volume and focus on either snorkeler safety or manatee awareness.
  - All snorkeling activity will be kept on the surface (no diving below the surface).
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- No initiating contact with or pursuing manatees or any other wildlife; any interactions with manatees will comply with 'Manatee Manners' (keeping hands at your side, crossed in front or behind the back).
  - All snorkelers must stay at least six feet from all manatees (including all resting manatees; manatees rising to the surface for breath; feeding/nursing manatees; and all cow/calf pairs) unless the manatee initiates an approach and interaction.
  - Only in cases of emergency may snorkelers stand or walk on the bottom of the Springs.
  - Any photography or videography that may result in any financial gain is prohibited without a separate, pre-approved commercial photography/filming SUP.
  - No artificial lighting will be allowed for photography/filming including but not limited to flash, strobe, and diffused lighting unless under a separate SUP.

If Alternative D is selected, the Refuge would immediately implement all components except for the lottery selection processes for both snorkeling, and photography and commercial filming in the Springs. Those processes will be utilized for the season beginning November 2016. If this alternative is implemented during the current manatee season (November 2015 – April 2016), snorkelers and photographers will be provided access on a first-come, first-served basis. When the lottery selection processes are in place, the Refuge and the City of Crystal River will widely announce the availability.

In cases of emergency or weather-related closures, every effort will be made to re-schedule a visit. In limited cases (such as verified health emergencies or extreme weather events), refunds will be considered.

#### *Clarifications for Alternative D*

This section provides clarifications of (previously proposed) Alternative C, now included in Alternative D (proposed). These clarifications are provided in response to public comments (Appendix A) which informed the proposed management measures in Alternative D.

Adjustments will be made to the spring run closure area to connect the spring run and the closed lobe at Pretty Sister. This will facilitate manatee movement between the two areas. For a comparison of the closed area see Figures 9 and 11.

The Springs may periodically be completely closed to all in-water public access. The Refuge Manager reserves the ability to restrict access to the Springs under 50 CFR §25.21 (e) in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources (i.e., manatees) of the area. The Refuge Manager may close or curtail Refuge uses of all or any part of an opened area to public access and use in accordance with the provisions in CFR §25.21 (e), without advance notice.

Foreseeably, the Springs will be closed to public entry for the duration of the bank stabilization construction project currently scheduled from May through September 2016.

Any other commercial activity (in-water, on-water, on the boardwalk, and/or the elevated viewing platforms) would require approval from the Refuge as well as a SUP, as appropriate.

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The Refuge currently charges \$200.00 per SUP with an additional \$100.00 per boat for commercial tour guiding at both King Spring and Three Sisters Springs. Due to the potential changes in management of Three Sisters Springs, the Refuge is re-assessing the cost of Commercial SUP. The Refuge would decrease the administrative fee for those SUPs allowing commercial guided tours to both King Spring year-round and Three Sisters Springs outside of the manatee season, to reflect potential changes in the cost of managing this use program. The administrative fee would be a one-time charge, annually, at the time the permit is issued. The following outlines the potential new administrative fees:

- \$125.00 for the SUP for the first boat and an additional \$75.00 per boat, annually, at King Spring.
- \$175.00 for the SUP for the first boat and an additional \$75.00 per boat, annually, at King Spring year-round and at Three Sisters Springs from April 1 until November 15.
- \$125.00 for the SUP for the first boat and an additional \$50.00 per boat, annually, at Three Sisters Springs from April 1 until November 15.

The general public, while engaged in in-water wildlife viewing, would be allowed to take photographs provided they adhere to the Standards of Conduct.

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## COMPARISON OF ALTERNATIVES

Table 4. Comparison of Alternatives: relative effects on existing management measures.

<b>Existing Measures*</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<i>In-Water Public access during manatee season</i>	<b>No change</b> (Public access via spring run)	<b>Change</b> (No public access)	<b>Change</b> (Limited public access via SUP and from boardwalk; maximum of 20 snorkelers with five guides)	<b>Change</b> (Limited public access via lottery and from boardwalk; maximum of eight snorkelers with two guides)
<i>Commercial SUPs</i>	<b>No change</b> (All SUPs issued annually)	<b>Change</b> (No SUPs issued for the Springs)	<b>Change</b> (Limited SUPs issued)	<b>Change</b> (City of Crystal River manages access)
<i>Paddlecraft permitted during manatee season</i>	<b>No change</b> (Open access to paddlecraft via the spring run)	<b>Change</b> (No access to paddlecraft)	<b>Change</b> (No access to paddlecraft)	<b>Change</b> (No access to paddlecraft)
<i>Photography rules and permits</i>	<b>No change</b> (All SUPs issued annually)	<b>Change</b> (No SUPs issued)	<b>Change</b> (Limited SUPs issued via lottery; maximum of two photographers with two guides)	<b>Change</b> (Limited SUPs issued via lottery; maximum of two photographers with one guide)
<i>Pets allowed in/around Springs</i>	<b>No change</b> (Pets on leash)	<b>Change</b> (No pets allowed)	<b>Change</b> (No pets allowed)	<b>Change</b> (No pets allowed)
<i>Interpretation/public information</i>	<b>No change</b> (Interpreters in-water and on boardwalk)	<b>Change</b> (Interpreters on boardwalk only)	<b>Change</b> (Interpreters on boardwalk only)	<b>Change</b> (Interpreters on boardwalk only)
<i>Manatee disturbance policy/guidance</i>	<b>No change</b> (Enforce Twelve Prohibitions)	<b>Change</b> (No in-water activities to enforce)	<b>Change</b> (Institute Standard of Conduct and Enforce Twelve Prohibitions)	<b>Change</b> (Institute Standard of Conduct and Enforce Twelve Prohibitions)
<i>Habitat improvements</i>	<b>Change</b> (Support bank stabilization)	<b>Change</b> (Support bank stabilization)	<b>Change</b> (Support bank stabilization)	<b>Change</b> (Support bank stabilization)

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## ***IV. ENVIRONMENTAL CONSEQUENCES***

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

### **EFFECTS COMMON TO ALL ALTERNATIVES**

#### **Effects on the Human Environment**

##### *Environmental Justice*

No alternative is expected to have a disproportionately high adverse effect on minority or low-income populations.

#### **Effects on the Cultural Environment**

Each of the alternative deal with managing human-manatee interactions in the Springs and adjacent waters. The proposed measures involve limited ground disturbances and/or construction. As these activities were not included among the public use infrastructure projects reviewed in 2014, additional consultation with FDHR and the affected Tribes will be required pursuant to Section 106 of the National Historic Preservation Act, as amended. However, the human-manatee interaction measures pose no risk to any historic properties on or near the Refuge.

#### **Effects on the Biological Environment**

Currently, the Springs are experiencing severe erosion where the banks are being undercut. Additionally, visitors are impacting the shoreline and vegetation. The SWFWMD's banks bioengineering project would stabilize the shoreline from current and future erosion by backfilling undercuts with soil bags and reinforcing the shoreline with limestone rocks, thereby stabilizing targeted shorelines and backfilling with material to promote root growth by existing vegetation. This would improve long-term bank stability, maintain the natural appearance of the site, and restore/improve the hydrologic function of the Springs. Preventing further erosion within the Springs would aid in protecting habitat for manatees and other aquatic animals.

#### **Effects on the Physical Environment**

##### *Water Quality and Hydrology*

Because this alternative would include supporting SWFWMD's bioengineering project to address bank erosion within the Springs, water quality and hydrology would likely improve, overall, after initial, short-term increases in turbidity during construction.

##### *Noise*

The bank stabilization work would produce some short-term construction noise.

##### *Aesthetics and Facilities*

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The SWFWMD's bioengineering project to address bank erosion via stabilization would have a long-term positive effect on aesthetics. The stabilization project would decrease eroding banks and falling trees and thus the appearance of falling/dead trees. Initially, to most visitors the installed limestone rocks would not look natural and the bank bioengineering would be evident until the vegetation grows over the new banks. This natural overgrowth is anticipated to happen rapidly given the amount of existing vegetation along the banks and the temperate climate of the Springs. Therefore, the Springs' banks visual change would progress from a current rooted, undercut and precipitous shoreline of crags, exposed root, and dying/leaning trees to a stable, vegetated shoreline growing on a stable base of indigenous limestone, returning the site's aesthetics to a more natural appearing and appealing condition.

## **ALTERNATIVE A - NO ACTION**

### **Effects on the Human Environment**

This alternative would not directly change existing conditions to the human environment, including human safety, economy, or recreation.

#### *Human Safety/Recreation*

Swimmer and paddlecraft interactions in Three Sisters Springs would continue to be a human safety concern under this alternative, due to absence of further management action. Additionally, minor safety concerns associated with the boardwalk would also continue to be a concern. Also, the risk of epizootic disease outbreak from pets would persist.

#### *Economic Conditions and Public Access*

This alternative would not have any short-term socioeconomic impacts. The absence of actions to reduce potential manatee disturbance and potential harassment via crowding from swimmers/snorkelers and paddlecraft, litigation, and other external factors could result in greater restrictions or complete elimination of access to the Springs during manatee season. Such a closure could impact local tour activities in the long term, and therefore, may have an effect on the local economy.

#### *Economic Benefits*

In 2011, according to a National Wildlife Refuge report (2013), "Banking on Nature", more than 150,000 visitors came to Crystal River NWR just to experience manatees. There were 429,500 visits to the Refuge in 2011 to engage in a variety of nature-based activities including wildlife observation, photography, education, and fishing. Furthermore, visitor expenditures to the economy of the counties (Citrus, Hillsborough, Marion, and Orange) of and surrounding the Refuge were \$24.2 million total, with non-residents accounting for \$23.6 million or 97 percent of total expenditures. This economic input for the associated counties resulted in an estimated economic effect, associated with recreational visits to the areas, of \$38.1 million with associated employment of 278 jobs - \$11.5 million in employment income and \$4.6 million in tax revenue (Carver and Caudill 2013).

#### *Economic Costs*

Refuge administrative costs would not be directly affected. Currently, 9 full-time employees are devoting at least 50 percent of their time to ensure visitation in the Springs does not have the potential to disturb manatees (Table 5).

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**Table 5. Estimated Agency Administrative and Infrastructure Costs- Alternative A.**

Anticipated Needs	Quantity	Unit Cost	Total
<b>Staffing</b>			
Refuge Manager	0.5 x 1	\$80,000	\$40,000
Visitor Services Specialist	0.5 x 1	\$70,000	\$35,000
Biologist	0.5 x 1	\$70,000	\$35,000
Maintenance Worker	0.5 x 1	\$40,000	\$20,000
Biological Technician	0.5 x 3	\$32,000	\$48,000
Law Enforcement Officers	0.25 x 2	\$70,000	\$35,000
Volunteer Coordinator	0.75 x 1	\$21,000	\$21,000
<b>Construction</b>			
Boardwalk	1	\$150,000	\$150,000
Elevated Viewing Platforms	2	\$37,500	\$37,500
<b>Maintenance</b>		\$0	\$30,000
<b>TOTAL</b>			<b>\$451,500</b>

NOTE: Three Sisters Springs is open 7 days a week from sunrise to sunset.

### **Effects on the Biological Environment**

The current condition of the Springs' biological environment, including water quality, vegetative communities and wildlife habitat, may experience long-term impacts under the no action alternative. Specifically, as visitor numbers continue to increase with unlimited access to the Springs, the numbers of resting and nursing manatees that could potentially be disturbed by swimmers and paddlecraft would continue to increase. The risk of epizootic disease outbreak from pets would persist.

### **Effects on the Physical Environment**

#### *Water Quality and Hydrology*

Increasing numbers of in-water visitors and continued crowding in the Springs would likely increase frequency of high turbidity and low visibility during manatee season over the long-term.

#### *Noise*

This alternative would not address high visitor numbers or over-crowding in the Springs. Therefore, current noise levels from these activities would not change.

#### *Aesthetics and Facilities*

Throughout February 2015, not a peak visitor month, 162 swimmers/snorkelers and paddlers were randomly surveyed as they exited the Springs. Approximately one-quarter of those surveyed responded that what they liked least was overcrowding inside the Springs, suggesting that overcrowding may have degraded the visitors' perceived aesthetics of the site and overall experience (Wolfe and Syverson, in prep.). As the No Action Alternative would not address overcrowding, perceived aesthetic impacts from these activities would likely continue.

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Because this alternative would preclude any additional construction or alteration of existing facilities, no further aesthetic impacts would be expected.

### *Summary – Alternative A*

Alternative A, the No Action Alternative, would not meet the purpose and need for the proposed action. Given increased numbers of visitors to the Springs during manatee season, this alternative would address neither human safety nor potential manatee disturbance from visitor overcrowding, nor risk of epizootic disease outbreak from pets currently allowed in the Springs.

## **ALTERNATIVE B - MANATEE VIEWING FROM LAND ONLY.**

### **Effects on the Human Environment**

Potential effects to the human environment for this alternative include impacts to: (1) human safety/recreation, (2) socioeconomic conditions, (3) recreational and public access to the Springs, and (4) environmental justice.

#### *Human Safety/Recreation*

Safety concerns at the Springs are centered on the high volume of snorkelers and swimmers recreating among the currently high volume of visitors on paddlecraft. It is common for snorkelers to be accidentally hit on the head by paddlecraft, particularly during high-volume weekends and holidays. Most of these collisions occur at the spring run where snorkelers and paddlecraft are funneled into a 5 foot wide narrow portion of the spring run where water flow is strongest and can restrict paddling control, sometimes resulting in collisions with swimmers. This alternative would eliminate this safety concern.

The boardwalk would be rebuilt to make it more user-friendly. Currently, the boardwalk can be slippery for visitors when it is wet. The walking surface would be replaced using a composite lumber material with a high friction coefficient. It is also recommended that a smooth composite lumber material be used as a top board for the guardrail system to prevent visitors from getting splinters. Additionally, an elevated viewing platform, with safety rails, would be added on the southwestern side of the Springs to improve manatee viewing and photography opportunities for the public.

#### *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: 1) increased manatee protection 2) improved quality of the visitor experience related to manatee viewing from the boardwalk and elevated viewing platform; 3) increased safety; 4) improved habitat health; and 5) improved shoreline stabilization. Economic costs consider the number of tour operators and outfitters that would be excluded from providing commercial in-water recreation opportunities inside the Springs and the number of visitors (guided and unguided) that would no longer have access to in-water recreation in the Springs during manatee season (November 15 to March 31).

#### *Economic Benefits*

The USFWS believes this alternative would 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

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industry. An indirect benefit may be noise reduction from decreased crowding in the Springs, which may increase property values.

The public's support for manatees and their protection has been examined through contingent value studies (Fishkind and Associates 1993, Bendle and Bell 1995, Solomon et al. 2004). Recent reports examining Citrus County tourism reveal that between January and April 2014, 49.8 percent of visitors to the County identified manatee watching as the purpose of their trip (Research Data Services, Inc. 2014). These economic studies characterize the value placed by the public on this resource and demonstrate that the public's willingness to pay for manatee protection is considerable, and that public support for manatee protection exists, in general.

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 \$4.21 billion or \$23.92 per household, when adjusted to reflect 2015 monetary values). Based on surveys of north Florida residents, Fishkind and Associates (1993) estimated that adult Florida residents would be willing to pay \$30.00 per year in 1992 dollars (or \$47.70 per year when adjusted to reflect 2015 monetary values) to help compensate for the adverse economic effects, if any, of protecting the manatee population (Fishkind and Associates 1993).

While neither of these studies is detailed enough to apply to this alternative specifically, they do provide an indication that the public confers substantial value on the protection of manatees.

The economic sector associated with tourism at the Springs overlaps with that associated with the wider Kings Bay and with manatee ecotourism, in general, in that tourists likely come to see any manatees rather than specific manatees in any one given location within the Bay. Solomon et al. (2004) concluded that the benefits of manatee protection in Citrus County exceeded the development benefits forgone by approximately \$8.2 to \$9.0 million primarily because of ecotourism (or \$10.2 to \$11.2 million adjusted to 2015 monetary value).

Another potential economic benefit is continued and increased tourism that likely results from an increase in manatee protection. Citrus County and the Springs are nationally and internationally recognized as primary destinations for winter 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 increasing.

Most visitors and local residents view manatees in the Springs from personal or commercial watercraft. Visitors pay commercial, eco-tour operators to equip them and take them out onto Kings Bay to view manatees, which may or may not include, specifically the Springs. 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. Currently, manatee viewing activity costs range from \$6.00 for boardwalk access at the Springs to guided kayak or snorkeling tours, throughout the Bay, that average \$35.00 and \$50.00, respectively.

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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.

In 2013, statistics for employment by industry for the number of establishments engaged in 'Leisure and Hospitality' define 321 businesses in Citrus County (Florida Legislature, Office of Economic and Demographic Research 2015). An estimate of the number of establishments across multiple categories that are potentially associated with tourism at the Springs or may promote the Springs as part of their business is 211 (Commercial Special Use Permit Visitors Reports 2010-2014 for Crystal River NWR). Therefore, approximately 66 percent of the leisure and hospitality economy in Citrus County may be associated with tourism at the Springs (the degree to which affected business sectors depend on manatee tourism at the Springs is not known; a few businesses may depend 100 percent on these visits while other businesses may be affected very little). The 'Leisure and Hospitality' sector comprises only 10.5 percent of the total industries in Citrus County (as compared to other sectors such as Trade, Transportation, and Utilities, 21.5 percent; and Professional and Business Services, 17.7 percent).

As such, limiting access to the Springs for enhanced manatee and manatee habitat protection may produce a minor shift in marketing focus in terms of geographic areas within the Bay, but is unlikely to have any long-term economic impact on the 'Leisure and Hospitality' sector in Citrus County. Additionally, improved protection for the manatees in their winter habitat at the Springs 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. The viability of the local manatee viewing industry, practiced by both commercial businesses and individuals, is challenged by reported acts of manatee disturbance and growing public perception of unsightly and unsustainable crowding associated with unsupervised in-water activities in the Springs.

Evidence suggests that there are already operators (SUP holders) shifting their use to other areas due to crowding in and around the Springs. Additionally, there are some SUP holders who do not use the Springs but have a permit to maintain access to King Spring.

Based on previously cited studies, the USFWS believes that this alternative would produce some economic benefits due to improved wildlife viewing experiences via increased access to the boardwalk for visitors. It is reasonable to expect that over the long-term, this alternative would result in some economic losses for commercial in-water guiding business and some economic gains for the overall community. Given the lack of detailed quantifiable economic data available for estimating these benefits, the magnitude thereof is unknown.

### *Economic Costs*

Affected Recreational Activities: For some users, the loss of winter season in-water access to these specific springs may cause them to forgo a given activity, such as snorkeling. In fact, one visitor study that relied on a variety of survey mechanisms found that the two most popular activities in Citrus County were manatee viewing and snorkeling/diving (Gold 2008). Given the popularity of these activities, visitors are likely to seek additional areas in Kings Bay where they can recreate.

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Affected Commercial Rental/Charter Boating Activities: Various types of charter boats use Citrus County waterways for nature tours and other activities. This alternative is unlikely to cause a significant adverse impact to businesses that provide charter or rental boats for manatee viewing. Enhanced manatee protection measures should improve the viewing experience and are likely to positively affect this industry. In general, the public perception that manatees are not being crowded within the Springs by in-water visitors provides for a positive overall perception of the community, tourism sector, and management agency. Added travel time may affect the length of a boat rental trip, which could result in fewer trips overall, creating a potential economic impact; or conversely, more time on the water looking for manatees in areas other than the Springs could extend rental times and prove an economic advantage. The economic impacts of this alternative on these activities are difficult to quantify but the net impacts are expected to be minimal and temporary. This is primarily because commercial rental and charter boating activities focused on manatees are currently and may continue to expand throughout Kings Bay and at multiple springs.

This alternative would affect less than one acre 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 recreational activities, and encourage more responsible wildlife viewing. While this alternative would prohibit certain activities within the Refuge, it does not prohibit recreationists from participating in similar recreational activities elsewhere. Alternative sites are available for all recreational activities that may be affected by this alternative. While the level of economic benefits that may be attributable to this alternative is unknown (including benefits associated with manatee viewing), these benefits would more than likely offset any temporary economic costs associated with the proposed action.

Agency Administrative Costs: Agency administrative costs would include costs associated with sign posting, 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 sign posting activities. Some existing signs may be removed and reused. Additional law enforcement and staff, education and outreach activities, and construction/maintenance costs are anticipated and estimated in Table 6.

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**Table 6. Estimated Agency Administrative and Infrastructure Costs- Alternative B.**

Anticipated Needs	Quantity	Unit Cost	Total
<b>Staffing</b>			
Wildlife Refuge Specialist	0.5 x 1	\$30,000	\$15,000
Entrance Booth Workers	1.5	\$21,000	\$31,500
Maintenance Worker	0.5 x 1	\$40,000	\$20,000
Biological Technician	0.5 x 2	\$32,000	\$32,000
Law Enforcement Officers	0.25 x 2	\$70,000	\$35,000
Supervisory Visitor Services Specialist	0.25 x 1	\$70,000	\$17,500
Interpreters	3 volunteers (4 interpretive stations)	\$1,000	\$1,000
Volunteer Coordinator	0.5 x 2	\$21,000	\$21,000
<b>Construction</b>			
Boardwalk	1	\$150,000	\$150,000
Elevated Viewing Platforms	2	\$37,500	\$75,000
<b>Maintenance</b>			
		\$0	\$30,000
<b>TOTAL</b>		<b>\$406,112</b>	<b>\$428,000</b>

NOTE: Three Sisters Springs would be open 7 days a week from 8AM-5PM.

#### *Recreation and Public Access to the Springs*

This alternative would modify recreational activities and current waterway access to the Springs due to seasonal closure of the spring run entrance to the Springs. These limitations would eliminate recreation in the Springs, including paddling, canoeing and snorkeling. This alternative would encourage wildlife viewing from land via the improved boardwalk and elevated viewing platforms. While this alternative puts the greatest limitation on seasonal access to the Springs, as in all three alternatives, it does not prohibit recreationists from snorkeling or pleasure boating via paddlecraft in public areas of Kings Bay. Alternative sites are available for all recreational activities that may be affected by this alternative.

#### **Effects on the Biological Environment**

Under Alternative B, the Springs would be seasonally closed to all public in-water access and activities from November 15 to March 31 (with designations for closures that may be made prior to November 15 and after March 31 during cold fronts when manatees are present), to prevent potential manatee disturbance and harassment. The shorelines within the Springs would be stabilized which would benefit manatee habitat.

By seasonally closing the Springs to all in-water access, snorkelers, photographers, and paddlecraft would be absent and manatees would be able to use the Springs and the spring run without potential visitor disturbance. During cold weather, manatees would be able to rest and nurse their calves in the warm-water Springs undisturbed.

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Because pets have the potential to interact with the manatees' environment, the potential for epizootic disease outbreak exists. An outbreak could impact resting and nursing in the Springs.

Toxoplasmosis is a rare disease in manatees, but has been recorded. The two previously reported cases consisted of a manatee calf in Florida with a central nervous system infection and an adult Antillean manatee from Guyana with lesions in the heart (Bossart 2007). Three reported cases of manatee toxoplasmosis recently occurred in Puerto Rico (Bossart et al. 2012). Since manatees are known to inhabit more urbanized areas, they may be exposed to effluents contaminated with pet feces containing the disease-vector oocysts. Therefore, the flow of this terrestrial parasite through the coastal ecosystem and the emergence of disease at the interface between wildlife, domestic animals, and humans are management concerns. Additionally, five types of morbilliviruses have been detected in marine mammals in the United States: canine distemper virus and phocine distemper virus in seals and sea otters; dolphin morbillivirus; pilot whale morbillivirus; and Longman's beaked whale morbillivirus, which are collectively referred to as cetacean morbillivirus in porpoises, dolphins, and whales (U.S. Dept. of Commerce/NOAA 2013). Though the Florida manatee's immune system appears highly developed to protect it against the harsh marine environment, the first viral disease associated with cutaneous papillomatosis was recently described in Florida manatees (Bossart et al. 2012).

Improving the boardwalk and building the elevated viewing platforms may require a limited number of trees along the boardwalk to be removed or trimmed to allow for the construction and line-of-sight for wildlife viewing.

## **Effects on the Physical Environment**

### *Water Quality and Hydrology*

Eliminating in-water visitors and crowding in the Springs, during winter months, would decrease frequency of high turbidity and low visibility over the long-term.

### *Noise*

This alternative would address high visitor numbers and over-crowding in the Springs. Therefore, current noise levels from these activities would decrease. Building elevated viewing platforms could produce some short-term construction noise.

### *Aesthetics and Facilities*

As this alternative would address overcrowding within the Springs themselves, perceived aesthetic impacts from these activities would likely be eliminated during manatee season.

Because the proposed elevated viewing platforms would be visible, they would have an impact on a portion of the Springs' viewscape, since no elevated viewing platforms currently exist. At their highest point, these platforms would remain beneath the upper tree canopy. Additionally, the platforms would be built with natural-colored construction materials to blend in with the surrounding vegetation. The platforms would materially enhance the wildlife viewing experience by diversifying viewing perspectives and limiting glare. This enhanced experience would augment public experiences of the Springs' ecosystem.

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## *Summary – Alternative B*

Alternative B would meet the purpose and need of the proposed action to limit or eliminate potential disturbance of resting and nursing manatees in the Springs during the winter season and improve manatee habitat via bank stabilization. Additionally, manatee-viewing opportunities from land would be increased and improved. The USFWS recognizes that this is the most restrictive alternative regarding public in-water access, seasonally, and therefore is likely to have the most immediate and temporary economic impact on the local manatee tourism industry.

## **ALTERNATIVE C - GUIDED IN-WATER MANATEE VIEWING**

### **Effects on the Human Environment**

Potential effects to the human environment for Alternative C include impacts to: (1) human safety while recreating, (2) socioeconomic conditions, and (3) recreational and public access to the Springs. This alternative would have similar potential impacts to the human environment as that of Alternative B. Socioeconomic and recreation/public access impacts are likely to be less given the controlled, limited in-water access to the Springs provided for in this alternative versus the complete elimination of in-water access during manatee season, as proposed in Alternative B.

#### *Human Safety/Recreation*

This alternative has the same human safety benefits of Alternative B – eliminating the potential hazard of crowding of swimmers and snorkelers with paddlers. Certified guides would provide for increased safety for snorkelers. The guides would also provide enhanced wildlife viewing experiences by interpreting the manatees' natural behavior in the Springs habitat.

#### *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: 1) increased manatee protection; 2) improved quality of the visitor experience related to manatee viewing from the boardwalk and elevated viewing platform; 3) increased safety; 4) improved habitat health; and 5) improved shoreline stabilization.

Potential economic costs are related to reducing the number of SUPs that allow commercial operations within the Springs. Economic costs consider the number of tour operators and outfitters that would be excluded from providing commercial in-water recreation opportunities inside the Springs and the number of visitors (guided and unguided) that would no longer have access to in-water recreation in the Springs during manatee season (November 15 to March 31).

#### *Economic Benefits*

The USFWS believes this alternative, as in Alternative B, would 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 aquatic vegetation from losses due to excessive turbidity, and noise reduction from decreased crowding in the Springs.

As detailed in Alternative B, the public's support for manatees and their protection has been examined through several studies finding that the public's willingness to pay for manatee protection is significant and that public support for manatee protection in general exists. Based on previous studies, the USFWS believes that this alternative would produce more economic benefit than Alternative B, given the opportunity to develop limited, guided snorkeling, photography, and videography. Less economic benefit is expected than Alternative A, since fewer opportunities for snorkeling, photography, and videography will be provided under Alternative C. Given the lack of information available for estimating these benefits, their magnitude is unknown.

*Economic Costs*

Affected Recreational Activities: For some users, the loss of winter season in-water access to the Springs via the spring run may cause them to forgo a given activity, such as snorkeling or paddling. Based on a visitor study that relied on a variety of survey mechanisms, the two most popular activities in Citrus County were manatee viewing, snorkeling, and diving (Gold 2008). Such paying visitors are likely to seek opportunities to view manatees in alternate areas of the Kings Bay or from land.

Affected Commercial Rental/Charter Boating Activities: Various types of charter boats use Citrus County waterways for nature tours and other activities. This alternative is unlikely to cause a significant adverse impact to businesses that provide charter or rental boats for manatee viewing and may even benefit them. Added travel time looking for manatee viewing opportunities may affect the length of a trip/rental, which could result in fewer trips overall, creating a potential economic impact; or conversely, more time on the water looking for manatees in areas other than outside the Springs, which could extend rental times and prove an economic advantage. The economic costs of this alternative on these activities cannot be quantified, but are likely to be minimal.

Agency Administrative Costs: Agency administrative costs would include costs associated with developing infrastructure needs to support land-based water access for guides, snorkelers, photographers, and videographers. This alternative would require some additional staff and some construction and maintenance costs which are estimated in Table 7.

**Table 7. Estimated Agency Administrative and Infrastructure Costs- Alternative C.**

Anticipated Needs	Quantity	Unit Cost	Total
<b>Staffing</b>			
Entrance Booth Workers	2	\$21,000	\$42,000
Maintenance Worker	0.5 x 1	\$40,000	\$20,000
Biological Technician	0.5 x 1	\$32,000	\$16,000
Law Enforcement Officers	0.5 x 2	\$70,000	\$70,000
Supervisory Visitor Services Specialist	0.25 x 1	\$70,000	\$17,500
Interpreters	2 volunteers (4 interpretive stations)	\$500	\$1,000
Volunteer Coordinator	0.5 x 1	\$21,000	\$10,500
<b>Construction</b>			
Boardwalk	1	\$150,000	\$150,000
Elevated Viewing Platforms	2	\$37,500	\$75,000
Maintenance		\$0	\$30,000
<b>TOTAL</b>			<b>\$489,500</b>

NOTE: Three Sisters Springs would be open 7 days a week from 8AM-5PM.

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As in Alternative B, this alternative would affect less than one acre of the State of Florida's 7.5 million acres of waterways and would add restrictions to an already restricted area to better protect manatees. As a result, Alternative C would impact the variety of in-water activities for some visitors and may lead some to forgo certain activities, but at the same time may encourage more rewarding and responsible wildlife viewing. While this alternative would prohibit certain activities within the Springs, it does not prohibit recreationists from participating in similar recreational activities elsewhere. Alternative sites are available for all recreational activities that may be affected by this alternative. While the level of economic benefits that may be attributable to this alternative is unknown (including benefits associated with manatee viewing), these benefits would likely minimize any economic impacts that may be associated with the proposed action.

#### *Recreation and Public Access to the Springs*

This alternative would modify current in-water activities in the Springs and waterway access to the Springs due to access limitations via the spring run during manatee season. These limitations would impact the amount of in-water activity experiences for some recreationists and may lead some recreationists to forgo certain in-water activities. In-water manatee viewing would be provided from an ADA-compliant floating dock within the Springs with a guide.

#### **Effects on the Biological Environment**

The current condition of the Springs' biological environment attributes, including water quality, vegetative communities, and wildlife habitat, would not experience any negative impacts under this alternative.

Under Alternative C, the Springs would be seasonally closed to all in-water access via the narrow spring run from November 15 to March 31 (with designations for closures that may be made prior to November 15 and after March 31 during cold fronts when manatees are present), to prevent potential manatee disturbance. The shorelines within the Springs would be stabilized which would benefit manatee habitat.

By seasonally closing the Springs to all in-water access via the spring run, paddlecraft would be absent and manatees would be able to enter and exit the Springs with less potential disturbance. Additionally, given the two closed lobes, manatees would be able to rest and nurse their calves undisturbed in these no-entry areas even while guided snorkel tours are being conducted.

Pet prohibitions will be like those in Alternative B. For an analysis of the anticipated effects of this prohibition, see Alternative B.

Improving the boardwalk and building the elevated viewing platforms may require a limited number of trees along the boardwalk to be removed or trimmed to allow for the construction and line-of-sight for wildlife viewing.

#### **Effects on the Physical Environment**

##### *Water Quality and Hydrology*

Limiting and guiding all snorkelers in the Springs, during winter months, would substantially decrease the frequency of overcrowding and reduce turbidity and improve visibility over the long-term.

##### *Noise*

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This alternative would address high visitor numbers and overcrowding in the Springs. Therefore, current noise levels from these activities would decrease. Building elevated viewing platforms and construction of the floating dock could produce some short-term construction noise.

### *Aesthetics and Facilities*

This alternative would address overcrowding within the Springs and improving perceived experience of the snorkelers at the Springs.

Because the proposed elevated viewing platforms would be visible, they would have an impact on a portion of the Springs' viewscape, since no elevated viewing platforms currently exist. At their highest point, these platforms would remain beneath the upper tree canopy. Additionally, the platforms would be built with natural-colored construction materials to blend in with the surrounding vegetation. The platforms would materially enhance the wildlife viewing experience in new ways by diversifying viewing perspectives and limiting glare.

An ADA-accessible floating dock would add a boardwalk-adjacent walkway and would introduce a new in-water structure. The access ramp to the dock and the floating dock would be constructed using natural-looking construction materials to best blend in with the surrounding vegetation and landscape. Additionally, the dock would be tucked into a natural cove in the Springs and would not be visible from the most scenic spring vistas so as not to compromise this view. It would be a low-profile, floating structure, rather than a fixed in-water structure, with only the minimum surface area required by ADA engineering standards. The structure would be placed under existing overhanging trees as closely configured to the Springs' bank as possible and would be removable in the off-season.

### *Summary – Alternative C*

Alternative C would limit recreational access to the Springs, and enhance and improve the public's wildlife viewing experience in the Springs. As with Alternative B, the USFWS recognizes that this alternative would have some immediate and temporary economic impact. This alternative would increase the level of manatee protection in the area overall while continuing to provide for sustainable ecotourism. Improved protection for the manatee may result in direct economic benefits by ensuring the continued, local presence of undisturbed and viewable manatees, ensuring the continued existence of the manatee viewing industry.

## **ALTERNATIVE D - MODIFIED GUIDED IN-WATER MANATEE VIEWING (PROPOSED ACTION)**

### **Effects on the Human Environment**

Potential affects to the human environment for Alternative D include impacts to: (1) human safety while recreating, (2) socioeconomic conditions, and (3) recreational and public access to the Springs. This alternative will have similar potential impacts to the human environment as that of Alternative C. Socioeconomic and recreation/public-access impacts are likely to be less given the controlled, limited in-water access to the Springs provided for in this proposed alternative versus the larger number of in-water recreationists previously proposed in Alternative C.

### *Human Safety/Recreation*

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This alternative would have the same human safety benefits of Alternative C by eliminating the potential hazard of crowding of swimmers and snorkelers with paddlers and even greater reduction of potential crowding than Alternative C.

### *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: 1) increased manatee protection; 2) improved quality of the visitor experience related to manatee viewing from the boardwalk and elevated viewing platform; 3) increased safety; 4) improved habitat health; and 5) improved shoreline stabilization. Potential economic costs would relate to eliminating SUPs for commercial operations within the Springs and providing public access via a lottery-selection process operated by the City. Economic costs consider the number of tour operators and outfitters that would be excluded from providing commercial recreation opportunities within the Springs and the number of visitors (guided and unguided) that would no longer have access to in-water recreation in the Springs during manatee season (November 15 to March 31).

### *Economic Benefits*

The USFWS believes this alternative, as in Alternative B and C, would 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 would include the protection of aquatic vegetation from losses due to excessive turbidity, and noise reduction from decreased crowding in the Springs.

The public's support for manatees and their protection and the economic benefits description in the 'Effects on Human Environment' section in Alternative B also apply to Alternative D.

### *Economic Costs*

Affected Recreational Activities: For some users, the loss of winter season in-water access to the Springs via the spring run may cause them to forgo a given activity, such as snorkeling, paddling, and in-water manatee viewing within the Springs. Such visitors are likely to seek opportunities to snorkel, paddle, and view manatees in alternate areas of Kings Bay or from land.

Affected Commercial Rental/Charter Boating Activities: While it is recognized that Three Sisters Springs is one of the primary destinations for visitors to view manatees, Three Sisters Springs is not the only area where visitors can view manatees within Kings Bay. The commercial guiding or rental companies estimated in their Special Use Permit Holder Reports that over 75,000 of their clients visited Three Sisters Springs in the 2014/2015 manatee season, between November and March. Under Alternative D, less than 10 percent of these visitors will have the opportunity to be selected in the lottery. Within Three Sisters Springs the potential impact per SUP holder would be approximately less than \$400.00 per day during the season. Due the restricted number of slots available in the lottery, there will likely be increased interest in manatee viewing opportunities in Kings Bay which would continue to be available to the public through SUP holders and other operators.

Agency Administrative Costs: Agency administrative costs would include costs associated with developing infrastructure needs to support land-based water access for guides and visitors. This alternative will require some additional staff and some construction/maintenance costs which would be shared with the City and are estimated in Table 8, below:

**Table 8. Estimated Agency Administrative and Infrastructure Costs- Alternative D.**

<b>Anticipated Needs</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total</b>
<b>Staffing</b>			
Maintenance Worker	0.25 x 1	\$40,000	\$10,000
Biological Technician	0.5 x 1	\$32,000	\$16,000
Law Enforcement Officers	0.5 x 2	\$70,000	\$70,000
Interpreter	1 volunteer (4 interpretive stations)	\$500	\$500
Volunteer Coordinator	0.5 x 1	\$21,000	\$10,500
<b>Construction</b>			
Boardwalk	1 (City of Crystal River assists in costs)	\$75,000	\$75,000
Elevated Viewing Platforms	2 (City of Crystal River assists in costs)	\$18,750	\$37,500
Maintenance	(City of Crystal River assists in costs)	\$0	\$15,000
<b>TOTAL</b>			<b>\$234,500</b>

NOTE: Three Sisters Springs would be open 7 days a week from 8AM-5PM

*Recreation and Public Access to the Springs*

Anticipated impacts to recreational and public access to the Springs are the same as Alternative C, 'Effects on Human Environment'.

**Effects on the Biological Environment**

The current condition of the Springs' biological environment attributes, including water quality, vegetative communities, and wildlife habitat, would not experience any negative impacts under Alternative D. Anticipated effects on the biological environment are the same as Alternative C, "Effects on the Biological Environment".

**Effects on the Physical Environment**

Anticipated effects on the physical environment including water quality and hydrology, noise, and aesthetics and facilities are the same as Alternative C. A modification to Alternative C, Alternative D would include an ADA-accessible ramp and stairs for limited public access which would introduce two new in-water structures into the physical environment. These structures would be constructed using natural-looking construction materials to best blend in with the aesthetics of the surrounding vegetation and landscape. Additionally, both the ramp and the stairs would be tucked into natural coves in the Springs and would not be visible from the most scenic spring vistas so as not to compromise the view. They would be low-profile structures with only the minimum surface area required by ADA engineering standards. The structures would be placed under existing overhanging trees as closely configured to the Springs' bank as possible

*Summary – Alternative D*

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Alternative D would limit recreational access to the Springs and enhance and improve the public's wildlife viewing experience in the Springs. As with Alternative C, the USFWS recognizes that this alternative may have some immediate and temporary economic impacts in the community. This alternative would increase the level of manatee protection in the Springs overall while continuing to provide for sustainable wildlife viewing. Improved protection for the manatee may result in direct economic benefits by ensuring the continued, local presence of undisturbed and viewable manatees, ensuring the continued existence of the manatee viewing industry in Citrus County.

See Table 9 for the Summary of Environmental Consequences by Alternative.

**Table 9. Summary of Environmental Consequences for Each of the Alternatives Proposed in the EA.**

<b>IMPACT</b>	<b>RESOURCE CATEGORY</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
<b>Human Environment</b>	Human Safety	Would not change existing human safety conditions.	Would improve human safety conditions.	Would improve human safety conditions.	Would improve human safety conditions.
	Socioeconomic Conditions	Would not, directly, change existing socioeconomic conditions	Some measurable effects anticipated for communities/individuals.	Some measurable effects anticipated for communities /individuals.	Some measurable effects anticipated for communities/individuals.
	Recreational and Public Access	Would not, directly, change existing recreation and public access conditions.	Would eliminate recreational activities in the Springs during manatee season.  Would affect current waterway access practices.	Would modify kinds of recreational activities in the Springs during manatee season.  Would affect current waterway access practices.	Would modify kinds of recreational activities in the Springs during manatee season.  Would affect current waterway access practices.
	Environmental Justice	Would have no disproportionate adverse effects on low-income or minority populations.	Would have no disproportionate adverse effects on low-income or minority populations.	Would have no disproportionate adverse effects on low-income or minority populations.	Would have no disproportionate adverse effects on low-income or minority populations.
<b>Biological Environment</b>	Wildlife (except listed species)	Would not, directly, change existing wildlife and would improve habitat beyond existing conditions.	Would not change existing wildlife and would improve habitat beyond existing conditions.	Would not change existing wildlife and would improve habitat beyond existing conditions.	Would not change existing wildlife and would improve habitat beyond existing conditions.
	Vegetation	Would temporarily change vegetation and improve habitat beyond existing conditions.  Would not affect distribution, abundance, or trends in populations of exotic plants.	Would temporarily change vegetation and improve habitat beyond existing conditions.  Would not affect distribution, abundance, or trends in populations of exotic plants.	Would temporarily change vegetation and improve habitat beyond existing conditions.  Would not affect distribution, abundance, or trends in populations of exotic plants.	Would temporarily change vegetation and improve habitat beyond existing conditions.  Would not affect distribution, abundance, or trends in populations of exotic plants.

<b>IMPACT</b>	<b>RESOURCE CATEGORY</b>	<b>Alternative A</b>	<b>Alternative B</b>	<b>Alternative C</b>	<b>Alternative D</b>
	Endangered and Threatened Species	<p>Would perpetuate increasing number of manatees potentially disturbed in the Springs.</p> <p>Would not affect other Federal candidate, proposed, or listed species or critical habitat beyond existing conditions.</p>	<p>Would eliminate potential disturbance of manatees in the Springs.</p> <p>Would not affect other Federal candidate, proposed, or listed species or critical habitat beyond existing conditions.</p>	<p>Would minimize potential disturbance of manatees in the Springs.</p> <p>Would not affect other Federal candidate, proposed, or listed species or critical habitat beyond existing conditions.</p>	<p>Would minimize potential disturbance of manatees in the Springs.</p> <p>Would not affect other Federal candidate, proposed, or listed species or critical habitat beyond existing conditions.</p>
Physical Environment	Water Quality & Hydrology	Would not change current water quality and would improve hydrology	Would potentially improve current water quality and would improve hydrology.	Would potentially improve current water quality and would improve hydrology.	Would potentially improve current water quality and would improve hydrology.
	Noise	Would not change existing noise levels associated with the Springs.	Would potentially lower noise levels associated with the Springs.	Would potentially lower noise levels associated with the Springs.	Would potentially lower noise levels associated with the Springs.
	Aesthetics & Facilities	Would not change existing facilities and would temporarily affect aesthetics.	Would improve existing facilities and would temporarily affect aesthetics.	Would improve existing facilities and would temporarily affect aesthetics.	Would improve existing facilities and would temporarily affect aesthetics.

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## Cumulative Impacts Analysis

NEPA defines “cumulative impacts” as the impact on the environment that 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).

Some manatee populations may be increasing and/or stabilizing in the face of past actions by federal, state, and local governments. Based on the 5-year review conducted by the USFWS in 2007 (USFWS 2007), the best available science shows the overall population of the Florida manatee has increased while the Antillean manatee population in Puerto Rico is stable. A status review on the manatee has begun. Human-induced threats to the species, including fatal boat strikes, injury, disease, and harassment, and habitat alteration continue to require ongoing and additional actions (such as the proposed alternative) to support manatee conservation to the point at which the species no longer requires protection under the ESA. Pursuant to the USFWS’s and the Refuge’s mission, we continue assessing this information with the goal of meeting our manatee recovery objectives.

Observations by law enforcement officers and manatee researchers imply that disturbance of manatees is reduced in areas designated as refuges, or sanctuaries or where swimmer and boaters are excluded (Wolfe and Syverson, in prep.). This indicates that, on a site specific basis, previous actions to protect the manatee have been successful. Public swim-with areas can experience potential human-related manatee disturbance. The designation of manatee resting areas within the Springs is expected to prevent disturbance of manatees in these areas and would enhance public experience and awareness of the measures necessary to protect the manatee. The cumulative impacts such as loss of recreational areas, and any inconvenience that visitors may experience due to these manatee-resting areas being closed, would generally be mitigated by improved visitor experience, overall.

Cumulatively and initially, socioeconomic impacts may occur as ecotourism practices refocus on manatee viewing that is more sustainable, such as observational experiences from land, or, in Refuge managed waters, in-water guided. Eventually, this cumulative impact may provide an economic gain by not only safe-guarding manatee habitat and manatees, the focus of ecotourism profits, but also by continuing to create a world-class destination that promotes sustainable, educational wildlife viewing experiences.

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## Unavoidable Impacts and Minimization Measures

The USFWS believes that there would be negligible effects to natural, cultural, aesthetic, and socioeconomic resources and that the proposed management actions would also ensure that possible impacts to manatees are avoided. Crystal River NWR understands that some individuals may be temporarily impacted due to implementation of the proposed action. Therefore, to expand nature-based tourism opportunities, the Refuge would work with our partners including the community, the Tourism Development Council, the City of Crystal River, and the chambers of commerce to promote alternative and/or additional, sustainable wildlife viewing opportunities throughout Kings Bay. Within the broader context, the Refuge proposes to work with Citrus County, the City of Crystal River, the community, and neighboring cities/counties to help develop a more comprehensive, nature-based tourism culture and identity across the Nature Coast landscape, including federal and state lands and waters at Chassahowitzka NWR's Salt Marsh Trail, Ozello Trail, Cedar Keys NWR, and Lower Suwannee NWR, Rainbow Springs State Park, Crystal River Archaeological State Park, Crystal River Preserve State Park, Fort Cooper State Park, Potts Preserve, St. Martins Marsh Aquatic Preserve, Withlacoochee State Forest, Yulee Sugar Mill Ruins Historic State Park, Two Mile Prairie, Ellie Schiller Homosassa Springs Wildlife State Park, and other protected natural areas throughout the county and surrounding areas. In order to offset some of the potential impacts associated with the Proposed Alternative D, several options are being explored within Kings Bay. These options include:

- In partnership with the community, install a small floating dock on the canal adjunct to the Springs to allow water-to-land access to the boardwalk for paddlers and snorkelers. This would offer recreational paddlers and snorkelers the opportunity to view manatees within the Springs from the boardwalk.
- Review data collected on manatee distribution within the Springs to determine if inserts (referred to as “key holes”) into the center of lobe closures may facilitate additional in-water wildlife viewing. Key holes, named for their shape, are spaces that are open to swimming and snorkeling and somewhat surrounded by a prohibited area. Depending on manatee distribution, “key holes” could provide extra areas for sustainable in-water viewing of manatees in their natural habitat, while minimizing the potential for disturbance by guided snorkelers (Figure 12).
- The Refuge would consider adding an additional “key hole” in Refuge waters at the Mullet Hole near King Spring. The Mullet Hole “key hole” would potentially create additional sustainable wildlife-dependent in-water viewing for visitors. This design would allow wildlife viewing visitors the ability to observe manatees in-water while lessening the potential for disturbance (Figure 13).
- In order to achieve the future plans of allowing sustainable wildlife viewing of manatees, an ADA-compliant floating dock, ramp, and observation tower(s) would be considered for construction to allow visitor access to viewing manatees from Refuge lands on Banana Island. The floating dock would be located on the northeast side of the island with a ramp running across the island to an elevated observation platform overlooking Mullet Hole and/or the King Spring. This additional wildlife viewing opportunity would allow visitors to observe manatees within seasonally closed Refuge waters, from an elevated site on land.

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Within the NEPA process, the Refuge would continue to look for opportunities to develop a comprehensive, sustainable wildlife viewing culture and experience in accordance with the Improvement Act across the Crystal River NWR Complex, including Crystal River, Chassahowitzka, and Tampa Bay NWRs. We would also partner with the City of Crystal River and local tour operators to diversify sustainable manatee viewing experiences throughout Kings Bay. These potential minimization measures proposed outside of the Springs would be considered in the pending Comprehensive Conservation Plan and associated EA for Crystal River NWR, which are in development.

**Figure 12 . Potentail Minimization Measures at the Springs; Small "Key Holes"- as Representated by the Yellow Rectangles- For Guided, In-Water Manatee Viewing.**





Figure 13. Potential Minimization Measures at Banana Island; a Manatee Viewing "Key Hole" at King Spring; ADA-Compliant Floating Dock, Ramp, and Elevated Viewing Platform.



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## V. Literature Cited

The following references cited in this review are on file in the North Florida Ecological Services Office or the Crystal River NWR Office:

Bendle, B. J. and F. W. Bell. 1995. An estimation of the total willingness to pay by Floridians to protect the endangered West Indian manatee through donations. Prepared for Save the Manatee Club and the Florida Department of Environmental Protection – Bureau of Protected Species Management. 61 pp. + appendices.

Bossart, G. D. 2007. Emerging Diseases in Marine Mammals: from Dolphins to Manatees Exposures to viruses, pollutants may lead to disease sometimes involving immune dysfunctions, among marine mammals. *Microbe* 2:544-549.

Bossart, G. D., A. A. Mignucci-Giannoni, A. L. Rivera-Guzman, N. M. Jimenez-Marrero, A. C. Camus, R. K. Bonde, J. P. Dubey, and J. S. Reif. 2012. Disseminated toxoplasmosis in Antillean manatees *Trichechus manatus manatus* from Puerto Rico. 2012. *Diseases of Aquatic Organisms* 101:139-144.

Carver, E. and J. Caudill, Ph.D. 2013. Banking on Nature: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation. October 2013. Division of Economics. U.S. Fish and Wildlife Service. Washington, DC. 365 pp. <http://www.fws.gov/refuges/about/RefugeReports/>

Citrus County Chronicle. January 10, 2010. Gulf Water Temperatures Recorded at Aripeka, FL.

Curtis, L. 2015. Special Use Permit 15006-41516 Collect representative plant samples for identification-Three Sisters Springs. [ESA \(16 U.S.C. 1531-1544](#), 87 Stat. 884), as amended -- Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 Act had amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926).

Fishkind and Associates. 1993. Economic impact of the Manatee Sanctuary Act. Technical Report. Prepared for the Volusia County Board of County Commissioners.

FCT. 2010. Three Sisters Spring Project Management Plan. Drafted by the City of Crystal River, the U.S. Fish and Wildlife Service, and the Southwest Florida Water Management District. Florida Communities Trust (FCT) Project #08-088-FF8.

FDHR. 2014 Three Sisters Springs, Crystal River National Wildlife Refuge, Citrus County, Florida. DHR Project File No. 2014-3313. Letter dated August 13, 2014. On file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Hardeeville, South Carolina.

FWC. 2007. Florida Manatee Management Plan, (*Trichechus manatus latirostris*). Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. 267 pp.

FWC. 2015. Florida's Endangered and Threatened Species. Species Conservation Planning Section, Division of Habitat and Species Conservation, Florida Fish and Wildlife Conservation Commission. Tallahassee, FL.

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5-10pp. [http://myfwc.com/media/1515251/threatened\\_endangered\\_species.pdf](http://myfwc.com/media/1515251/threatened_endangered_species.pdf)

FWC. 2014. Manatee Synoptic Surveys. Florida Fish and Wildlife Research Institute.

FWC. 2015. Manatee Synoptic Surveys. Florida Fish and Wildlife Research Institute.

Florida Legislature, Office of Economic and Demographic Research. 2015.

Gold and Associates. 2008. Citrus County TDC Visitor Satisfaction Survey. August 26, 2008. 8 pp.

HAS Engineers and Scientists [HAS] 2010. Environmental site assessment: Three Sisters Springs. Prepared for the Conservation Fund, U.S. Fish and Wildlife Service, Southwest Florida Water Management District, the City of Crystal River and Florida Communities Trust Program. HAS Project Number 603-7681-00.

Herrington, S. J. 2012. Three Sisters Springs Focal Area Conceptual Design for Freshwater Restoration. TNC-FWC Agreement No. 11043. 60 pp.

Kleen, J. M. and A. D. Breland. 2014. Increases in seasonal manatee (*Trichechus manatus latirostris*) abundance in Citrus County, Florida. *Aquatic Mammals* 40(1): 69-80, DOI 10.1578/AM.40.1.2014.69.

[Marine Mammal Protection Act of 1972](#) (16 U.S.C. 1361 - 1423h, 86 Stat. 1027), Public Law 92-522, approved October 21, 1972, as amended 2007.

Solomon, B. D, C. M. Corey-Luse, and K. E. Halvorsen. 2004. The Florida manatee and eco-tourism: toward a safe minimum standard. *Ecological Economics* 50:101-115.

SWFWMD. 2004. Crystal River/Kings Bay Technical Summary. 1966-2004. Surface Water Improvement and Management Program. Resource Management Department. 34pp. [http://www.citruscounty.fl.org/devservices/commdev/community/cr\\_kingsbay\\_summary.pdf](http://www.citruscounty.fl.org/devservices/commdev/community/cr_kingsbay_summary.pdf)

SWFWMD. 2009. An Inventory of Spring Vents in Kings Bay, Crystal River, Florida. Submitted by Vanasse, Hangen, and Brustlin, Inc. University Park, Florida. 14 pp.

U.S. Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service. 2013. Morbillivirus infection in dolphins, porpoises, and whales. 2pp.

U.S. Fish and Wildlife Service (USFWS). 2001. Florida manatee (*Trichechus manatus latirostris*) recovery plan, third revision. USFWS. Atlanta, Georgia. 144 pp. + appendices.

USFWS. 2007. West Indian Manatee (*Trichechus manatus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Southeast Region. Jacksonville Ecological Services Office, Jacksonville, Florida. Caribbean Field Office, Boqueron, Puerto Rico. 79 pp.

USFWS. 2010. Commercial SUP Visitor Reports for Crystal River National Wildlife Refuge (CRNWR).

USFWS. 2013. Manatee Manners Outreach Materials. Crystal River National Wildlife Refuge.

USFWS. 2014. Public Use Survey, 2009-2014. Crystal River National Wildlife Refuge.

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USFWS. 2014. Commercial SUP Visitor Reports for CRNWR.

USFWS. 2014. Three Sisters Springs, Crystal Springs National Wildlife Refuge, Citrus County. Letter dated July 28, 2014. On file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Hardeeville, South Carolina.

USFWS. 2015. Seasonal Report; Results of the 2015 Human and Manatee Research Projects. Crystal River National Wildlife Refuge.

USFWS. 2015. Final Emergency Environmental Assessment for Manatee Wildlife Viewing, Three Sisters Springs, Crystal River NWR, Florida 36 pp.

Wolfe, C. and R. E. Syverson. (In prep.). Manatees, People, and Three Sisters Springs. Crystal River National Wildlife Refuge Complex.

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## *Appendix A. Public Comments and USFWS Response*

On August 5, 2015, the Service announced the availability of a Draft EA for the Three Sisters Springs Unit of the Crystal River NWR: Aquatic Habitat and Wildlife-Viewing Improvements. A 30 day public comment period was opened. During the first public comment period, substantive comments were received and are included in Appendix A Section A. Comments received after the second public comment period, will be address in this appendix under Section B.

### **Section A.**

**Comment:** Building Additional Infrastructure (boardwalk, docks)

**Service Response:** The Declaration of Restrictive Covenants states “At least four recreational facilities, such as a canoe/kayak launching platform, fishing pier, picnic pavilions, and wildlife viewing platforms, shall be provided. The facilities shall be developed in a manner that allows the general public reasonable access for observation and appreciation of the natural resources on the project site without causing harm to those resources.” Additionally, it states “All buildings, structures, improvements and signs shall require the prior written approval of FCT as to purpose. Further, tree removal, other than non-native species, and major land alterations shall require the written approval of FCT. The approvals required from FCT shall not be unreasonably withheld by FCT upon sufficient demonstration that the proposed structures, buildings, improvements, signs, vegetation removal or land alterations will not adversely impact the natural resources of the Project Site. FCT's approval of the Recipient's Management Plan addressing the items mentioned herein shall be considered written approval from FCT.”

In order to facilitate wildlife viewing at Three Sisters Springs, we must provide reasonable structural accommodations for the public, pending approval from FCT. We are considering the construction of additional access point(s) as we further develop the site.

**Comment:** Implementation of Cold Weather Closures

**Service Response:** The Service cannot predetermine the number of days when we may have cold weather closures. Refuge staff considers a number of factors to determine the closings. Any one or a combination of factors may be used to determine the need to close the springs. Examples of these factors include:

- Predicted or sustained low air temperatures; and/or
- High manatee numbers/increasing aggregations; and/or
- Predicted or sustained low Gulf water temperatures; and/or
- Injured or stressed manatees; and/or
- Predicted storm fronts.

**Comment:** Creation of keyholes

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**Service Response:** Any “keyholes” would only be established after manatee distribution data was collected and analyzed. If keyhole(s) were established, they would be monitored and adjusted based on manatee response the changed boundary lines. To address concerns about the keyhole created by closure of the Three Sisters Springs spring run, the Service will adjust the closure line at the mouth of the spring run to allow manatees to move freely without crowding from humans between Idiot’s Delight 1 and 2 and the run.

**Comment:** Closing Spring Run

**Service Response:** By prohibiting in-water entry through the spring run, the potential for compromising manatee behavior in Three Sisters Springs is significantly reduced. As such, the benefits from land entries far outweigh any perceived benefits associated with entering the Springs through the spring run.

**Comment:** Complete Shutdown of the Springs

**Service Response:** Consideration was given to closing Three Sisters Springs entirely during manatee season to all in-water activities under Alternative B in the Draft Environmental Assessment. In evaluating Alternative B, we considered the needs of the manatee, as well as our obligations to manage the property consistent with our Management Agreement with the City and the State and the July 2012 Three Sisters Springs Project Management Plan provisions that state that springs in-water activities are something that should be continued while the Service manages the property.

Per the Management Agreement for Certain Land Located Within the City of Crystal River, Citrus County, State of Florida signed by the City, State, and FWS; page 2, #3. “.... 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.”

Per the Three Sisters Springs Project Management Plan, Florida Communities Trust (FCT) Project #08-088-FF8, A project of: The City of Crystal River, The U.S. Fish and Wildlife Service, and The Southwest Florida Water Management District; Revised July 2012:

Page 15, “Public Uses: Water Access to the Three Sisters Springs. 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 closures of Three Sisters Springs during the coldest winter months and would consider full closure only for extreme cold winter events. (Emphasis added.)

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Management actions concerning the protection of manatees in the springs and adjacent areas will be addressed independent of the acquisition and will be made with input from the public as provided for by federal law.”

**Comment:** Ban smoking in/on Three Sisters Springs

**Service Response:** The City of Crystal River voted to ban smoking at Three Sisters Springs last year prior to the boardwalk being opened on a limited basis to the public. The U.S. Fish and Wildlife Service (Service) will include a smoking ban on the boardwalk, the majority of the property, and in-water at Three Sisters Springs in our regulations. We will consider providing a smoking area near the shuttle station.

**Comment:** Dark color wet suits

**Service Response:** Researchers believe that manatees possess dichromatic vision. Studies of manatee vision revealed that they can distinguish between blue and green light pigments, but few others. Given the limited scientific information on vision and light sensitivity in wild Florida manatees, the Fish and Wildlife 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 minimize potential disturbance to endangered Florida manatees in a critical habitat, such as Three Sisters Spring, utilized primarily for resting. The FWS proposes using off-color wetsuits, such that manatees would be less attracted to such colors and thus decrease the potential for manatees to be attracted to people in the springs. This measure enhances our intent of a passive wildlife observation experience.

**Comment:** Extend Visitation Hours

**Service Response:** Per observations, manatees are usually more active and begin to leave around mid-morning. Therefore, we will not extend visitation to include additional hours earlier in the day.

**Comment:** Guide Certification

**Service Response:** Guides do not have to carry a dive master certification, but will be required to have an industry-recognized professional liability insurance for their snorkelers. A number of dive/skin diving leadership options exist which would allow for industry-recognized professional liability insurance coverage.

**Comment:** Increase Visitation and SUP Holders

**Service Response:** A variety of alternatives were considered when developing this recommendation. After a thorough analysis of all of the alternatives developed along with consideration of the public and partner input received during the public involvement process, the Service has determined that Preferred Alternative D (Modified Alternative C), satisfies the purpose and need of the proposed

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action and is practicable and feasible to accomplish our conservation and management goals, in accordance with the Deed of Restrictive Covenants and the Management Agreement.

The City of Crystal River, as part owner of the property, will provide services that promote wildlife-dependent, recreational uses which are directly related to the purposes of the Declaration of Restrictive Covenants with the Florida Communities Trust, the Management Agreement, the Three Sisters Springs Project Management Plan, the Refuge's establishing purposes and the mission of the Service.

The City of Crystal River will serve as the "Municipal Partner" for visitor services and operations at Three Sisters Springs under a single SUP which will be encompassed in a joint Memorandum of Understanding with Crystal River NWR, Florida Communities Trust and SWFWMD. The Municipal Partner will operate visitor services that provide limited, public recreational access, with assistance from Service-trained guides and educational interpreters. The Municipal Partner provides these public services and support of wildlife-dependent, sustainable, and appropriate public-use activities. The City of Crystal River will identify a process to accomplish limited, public recreational access at a later date.

**Comment:** Filming Manatees

**Service Response:** Any TV station that wants to film manatees in Three Sisters Springs from the boardwalk will not have to hire a licensed SUP cinematographer. However, cinematographers would have to obtain a Special Use Permit (SUP) and hire a certified guide to take any in-water photographs or videos unless they applied for and were selected in the commercial photography/videography lottery which also requires that they are guided.

**Comment:** Distinguishing between guides

**Service Response:** The Service will implement a system to identify each SUP holder and guide which will be shared with both staff and volunteers monitoring Three Sisters Springs.

**Comment:** Guides assisting manatees in distress

**Service Response:** Certified guides and their clients who observe a manatee in distress will be required to contact FWC's Wildlife Alert Hotline at 1 888 404 3922 and Crystal River NWR. Guides may be asked to assist authorized rescuers with their efforts to assist and aid distressed manatees.

**Comment:** Consequences of closing 3SS down on rest of Bay

**Service Response:** Commenters observed that a consequence of limiting the number of in-water visitors to Three Sisters Springs would be additional crowding at other locations throughout King's Bay and Crystal River and noted that additional measures, including standards of conduct, would likely be needed to address this.

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The Service is working with the City of Crystal River and Citrus County to address possible crowding at these sites, including the development of standards to minimize the possible disturbance of manatee behavior.

**Comment:** Exclusion of Paddlecraft

**Service Response:** The EA prohibits paddlecraft to insure that manatees aren't disturbed by paddlers. As such, we will not provide separate visitor times for swimmers and paddlers. The measures identified in the EA are what the Service could reasonably implement within our financial and personnel capacity to avoid the potential for manatee disturbance. While the mentioned alternatives may be viable management measures, the USFWS does not have the staff or funds to implement separate visitation times nor monitor tides and manatee usage hourly.

**Comment:** Legality of closing navigable waterway

**Service Response:** Goodman vs. Crystal River does not apply in the case of a National Wildlife Refuge. This case was filed under the Rivers and Harbors Act. It stands for the principal that because these waters are navigable they are subject to laws adopted by Congress pursuant to the Commerce clause of the U.S. Constitution (sometimes termed the federal navigation servitude). In that case the relevant law pursuant to the Commerce clause was a prohibition on the construction of barriers in navigable waters without a Corps permit. The Service intends to implement a closure to public access, not construct an obstruction that would create a physical barrier to access into the springs. As a federal agency, the Service is provided certain rights and responsibilities to manage our trust resources under a National Wildlife Refuge that private citizens or other entities are not similarly afforded.

Our authorities under the Refuge Improvement Act allow us to take any measures necessary to ensure the public safety and protect wildlife on Service owned or managed lands, including limiting water access. As such, we are closing the spring run and lobes to address these concerns.

**Comment:** Public scoping and review process

**Service Response:** On August 5, 2015, the Services announced the availability of another Draft EA for the Three Sister Springs Unit of the Crystal River NWR: Aquatic Habitat and Wildlife-Viewing Improvements. A 30-day public comment period was opened, to which the Service received approximately 2600 written public comments. Public participation was also available during two public meetings held on August 11 and 12, 2015. Comments came from State and Federal agencies as well as from individuals, conservation organizations, tour operators, and other stakeholders.

Previous to this EA, the Service sought public participation for manatee viewing. On December 15, 2014, the Service announced the availability of a previous EA for manatee viewing at Three Sister Springs and opened a 14-day public comment period. This final EA and Finding of No Significant Impact were published on February 26, 2015. The alternatives and scope of the affected environment for this EA were compiled after considering public comments and meetings for the

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Crystal River NWR Comprehensive Conservation Plan. They 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.

The Council on Environmental Quality regulations and Departmental NEPA procedures require public notification, where appropriate, to allow the public to be involved in the EA process. However, no time periods are specified in the CEQ NEPA regulations or Departmental NEPA procedures for the review of the EA. We determined that the 30-day period for public review of the EA was appropriate. (Note: public review and comment as well as publishing an opening of public comment notice in the Federal Register are optional for a Draft EA).

**Comment:** Analysis of social and economic costs

**Service Response:** We analyzed the effects of the preferred management actions under Chapter 2 of the EA. In accordance with Executive Order 12866, the social and economic impacts of the preferred alternative does not meet the threshold for further analysis.

**Comment:** Implementation of Preferred Alternative

**Service Response:** These measures would apply as soon as the Service finalizes the EA and can implement them. In regards to special considerations (measures) for city residents, the Service is obligated to treat the entire public equally and cannot provide special treatment to local residents, including free access or access at a reduced rate. The lottery system ensures equal treatment since anyone can apply for a swim-with permit at Three Sisters Springs.

**Comment:** Monitoring Results

**Service Response:** Monitoring results are in the Appendices and provided at:

[http://www.fws.gov/refuge/Crystal\\_River/Three\\_Sisters\\_Springs\\_Manatee\\_Information.html](http://www.fws.gov/refuge/Crystal_River/Three_Sisters_Springs_Manatee_Information.html)

Please click on: View the three-part second study through this slide presentation. "Results of the 2015 Manatee and Human Interactions Observational Studies, Three Sisters Springs, Conducted by USFWS Biology Interns and Volunteers."

**Comment:** Visitation numbers cited in EA

**Service Response:** The cited visitation numbers only include those visitors who came to Three Sisters Springs while guided by SUP holders for in-water viewing.

**Comment:** Authorities of the Service

**Service Response:** The Refuge Manager has the ability to restrict access to any refuge-owned or managed lands or waters under 50 CFR §25.21 (e) in the event of a threat or emergency

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endangering the health and safety of the public or property or to protect the resources of the area without advance notice.

**Comment:** Disturbance of manatees

**Service Response:** Within Three Sisters Springs, the Standards of Conduct require a separation distance of six feet between a manatee and a swimmer. This distance must be maintained except when a swimmer is approached by a manatee. Swimmers are prohibited from pursuing manatees at all times, consistent with the 12 Prohibitions. The Standards and Prohibitions ensure that manatee behavior is not compromised. Certified guides are responsible for ensuring that their clients abide by the Standards of Conduct.

**Comment:** The Declaration of Restrictive Covenants and Management Agreement

**Service Response:** Funding used to purchase Three Sisters Springs was provided with the understanding that the site would be managed as part of the Crystal River National Wildlife Refuge under the National Wildlife Refuge System which was set forth in the Management Agreement which is based on the Three Sisters Spring Project Management Plan. The Management Agreement sets forth that the property be managed under the National Wildlife Refuge System; therefore, Federal laws dictate regulations for management actions. However, the Service is sensitive to the public expectation that people have access to the springs.

The Declaration of Restrictive Covenants states that these uses “will likely include.” We are providing for likely uses in-water and are not closing the spring entirely. The Service also takes into account the federal statutes (including the ESA and Marine Mammal Protection Act) that guide our management regime. This is clearly spelled out in the Management Agreement. Monitoring during the 2014-2015 manatee season revealed that existing in-water uses at unrestricted levels had the potential to disturb manatees. Therefore, this Environmental Assessment will implement measures for existing in-water uses which will enhance visitor experiences and avoid the potential to disturb manatees. The protection of listed and non-listed wildlife and their habitat is also identified in the Declaration of Restrictive Covenants.

If a “sunset clause” were to be established, a new EA and NEPA process would have to be completed annually to affect management actions. Consistent with the EA, the refuge intends to monitor the springs, manatee viewing activities, and the effects of new management actions so that we can adapt them in the future.

**Comment:** Sanctuary closures, definition

**Service Response:** The Kings Bay Manatee Protection Rule allows the Service to close existing sanctuaries prior to November 15 and after March 30 in the event of early and late cold fronts. The Service may also designate a Three Sisters Springs closure pursuant to our authorities under the Refuge Administration Act. This act allows us to close or curtail refuge uses in all or any part of an

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area open to the public and used in accordance with the provisions in 25.21 CFR, without advance notice.

Three Sisters Springs cannot be considered a sanctuary as Federal manatee sanctuaries prohibit all waterborne activities, including swimming, within designated sanctuaries. As such, Three Sisters Springs could not be considered a Federal manatee sanctuary in the event that swimming occurs here, which is the preferred alternative D of this EA.

**Comment:** Studies and monitoring

**Service Response:** Monitoring during the 2014-2015 manatee season revealed the potential for both swimmers and paddlers using the spring run to cause manatees to wait to enter or exit the springs. This potential impact on manatee behavior would not change regardless of SUP holders.

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Appendix B. Section 7 Evaluation

**INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM**

**Originating Person:** Andrew Gude

**Telephone Number:** 352 563-2088 ext 202; CELL 703 622-3896

**E-mail Address:** [Andrew.Gude@fws.gov](mailto:Andrew.Gude@fws.gov)

**Date:** November 2, 2015

**I. Region:** Fish and Wildlife Service (FWS or Service), Region 4 (Southeast)

**II. Service Activity (Program):** National Wildlife Refuge (NWR) System

**III. Geographic area or station name:** Crystal River National Wildlife Refuge (CRNWR or Refuge).

**IV. Location:**

**A. Ecoregion Number and Name:** 32-North Florida Ecosystem

**B. County and State:** Citrus County, Florida

**C. Section, township, and range (or latitude and longitude):** Section 28, Township 18S, Range 17E; Latitude: 28.88872533, Longitude: -82.58919102

**D. Distance (miles) and direction to nearest town:**

Within the City of Crystal River's city limits. See Map 1

**V. Action Area:** Three Sisters Springs (the Springs)

**VI. Pertinent Species and Habitat:**

**A. Listed species potentially present within the action area:**

- 1) West Indian manatee (*Trichechus manatus*)
- 2) Wood stork (*Mycteria americana*)
- 3) Eastern indigo snake (*Drymarchon couperi*)
- 4) American alligator (*Alligator mississippiensis*)

**B. Proposed species and/or proposed critical habitat within the action area:**

The action area is located in designated critical habitat for the West Indian manatee.

**C. Candidate species within the action area:**

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None

**D. Include species/habitat occurrence on a map.**

Local species/habitat occurrence maps are not available for these species.

**VII. Species/habitat occurrence:**

**A. West Indian manatees** are associated with the warm water springs and the spring run located within the action area (Three Sisters Springs), primarily during the winter months.

**B. Wood storks** are associated with roosting trees located within the action area.

**C. Eastern indigo snakes** are occasionally associated with human-altered habitats such as that found associated with Three Sisters Springs. There are no records of eastern indigo snakes from this site.

**D. American alligators** have been seen using the canals outside Three Sisters Springs and one has been observed in Lake Crystal.

**VIII. Need for the Proposed Action**

The Florida manatee (*Trichechus manatus latirostris*) (a subspecies of the listed entity, the West Indian manatee, *Trichechus manatus*) is an Endangered Species Act (ESA), and Marine Mammal Protection Act (MMPA) protected trust species.

Florida manatees travel and congregate in the warm water springs found in Three Sisters Springs (the Springs), Kings Bay. Hundreds of manatees are known to seek refuge in the Springs to shelter from the cold. This aggregation of manatees attracts tens of thousands of people who come to view them from non-motorized vessels, while swimming in the water, and from an adjoining boardwalk. The number of manatees using the area and number of visitors to the site are increasing each year. In February 2015, a record 706 manatees were counted in Kings Bay, including 446 manatees in the Springs.

Manatees have been impeded by swimmers and paddlecraft in the spring run while traveling to and from the Springs. They have also been disturbed in the Springs while resting, nursing, and engaging in other natural behaviors. When disturbed, manatees may leave the area and/or alter their normal behavior patterns. Crowding by visitors may also cause manatees to leave the action area. The proposed action is needed to minimize the potential for viewing-related manatee disturbance and to provide manatees with unimpeded access to the Springs.

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## IX. Description of the Proposed Action

The CRNWR seeks to implement the following management measures (or actions) during the manatee season: November 1 – April 15 at Three Sisters Springs in order to address potential manatee viewing-related disturbance. The proposed actions are for the Three Sisters Springs Unit of the CRNWR, managed under the authority of the National Wildlife Refuge Administration Act (NWRAA), the ESA, and the MMPA. These actions are intended to manage visitor activities and numbers within the Springs in order to protect manatees from potential viewing-related manatee disturbance and conserve the natural environment of the Springs as a National Wildlife Refuge. The proposed actions include:

**1) Close all in-water access to the Springs via the narrow spring run during manatee season (November 15 to March 31) and prior to November 15 and after March 31 during cold fronts when manatees are present;**

Purpose: Manatee ingress and egress to Three Sisters Springs is blocked on many occasions by visitors in the spring run. At the narrowest point during mid-tide, the spring run is approximately five feet wide, and creates a bottleneck for swimmers, paddle-craft, and manatees. On one of the busiest days recorded, December 27, 2015, total passages by manatees, snorkelers, and paddlers (including kayaks, canoes, and paddle boards) through the spring run was 2,325 or one every 15.4 seconds. This volume of visitation and the mere presence of visitors in the spring run may compromise manatee movement patterns and behavior. By keeping snorkelers and boaters out of the spring run, the Refuge is eliminating this risk. The refuge will also minimize the potential for viewing-related manatee disturbance caused by large numbers of visitors in the Springs by only providing small numbers of guided visitors with in-water access from the boardwalk. Extending the season will allow CRNWR to prevent congestion and blockages in the spring run and large numbers of visitors to the Springs during early and late winter cold fronts, as needed.

Justifications:

- Allows manatees to enter/exit spring run undisturbed during manatee season.
- Closing the spring run and allowing limited in-water access from the boardwalk reduces the potential for manatee disturbance.

*Data:* Observations by Refuge staff, seasonal manatee inventory data, Tour Operator Visitor Reports (2014-15 visitor numbers), boardwalk visitors' survey including visitor numbers, crowding assessments, visitor feedback; additionally, numbers of documented violations increased over time correlated with increased visitor numbers.

**2) Provide guided, in-water access to limited numbers of visitors, daily, via a lottery system in partnership with the Municipal Partner. In-water, guided manatee viewing will be available during the hours of 9 a.m. and 4 p.m. daily, except during closures. Access will be conditioned by numbers of manatees present, temperatures, and tides. Entry into the Springs for mobility impaired visitors will be provided via an ADA-compliant ramp at the southeastern edge of the Springs at the junction of the Spring Run and Pretty Sister. Entry into the Springs for the visitors from the general public**

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**will be provided via stairs on the north side of Deep Sister adjoining the existing viewing platform.**

Purpose: Service policies, strategies, and requirements concerning the management of wildlife-dependent recreation programs within the NWR System focus on providing opportunities for quality recreational and educational experiences that do not compromise ecological integrity. As described in Number 1 above, the Service proposes to close the spring run and provide limited in water access to visitors via the boardwalk. Visitors will be escorted to Three Sisters Springs by guides on a limited and controlled basis. Controlling the number of visitors to the spring and limiting in-water viewing reduces the potential for viewing-related manatee disturbance. By conditioning access based on numbers of manatees present, temperatures, and tides, potential visitor disturbance of resting manatees will be further reduced.

Justifications:

- Guides will provide a quality recreational and educational experience and will ensure that visitor actions do not disturb manatees.
- Controlling in-water visitor crowding reduces the potential for viewing-related manatee disturbance.
- Limiting visitor access to those times when conditions are appropriate will further minimize viewing-related manatee disturbance.
- Entries here would only occur when manatees are not present at or near the ramp.

*Data:* Observations by Refuge staff, seasonal manatee inventory data, Tour Operator Visitor Reports (2014-15 visitor numbers), boardwalk visitors' survey including visitor numbers, crowding assessments, and visitor feedback.

**3) Require FWS-certified guides to accompany and supervise visitors during in-water tours inside Three Sisters Springs; standardize Springs-specific guide certification for guides; and institute Standards of Conduct for guides, and their clients that supports and promotes responsible, sustainable wildlife-viewing and the ecotourism industry;**

Purpose: Each wildlife-dependent recreational activity must be determined to be appropriate and compatible on a NWR (i.e. activities cannot materially interfere with or detract from the fulfillment of the NWR System mission or the Refuge's specific purposes). By requiring certified guides and by providing certification training to guides and their clients, visitors will be provided with a wildlife viewing experience that reduces the potential for adverse effects on wintering manatees. Education provided to the guides also decreases the possibility of that visitors will violate the 12 Prohibitions. The Standards of Conduct that guides and their clients abide by includes measures that minimize manatee viewing-related disturbance and supports and promotes responsible and sustainable wildlife-viewing and the ecotourism industry.

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Justifications:

- Providing Service-trained guides ensures that clients and visitors are knowledgeable of rules and guidelines for manatee viewing and minimizes viewing-related manatee disturbance.
- Providing standardized, Springs-specific training provides consistent, quality information to visitors and improves the wildlife viewing experience.
- See the Environmental Assessment “Three Sisters Springs Unit of Crystal River National Wildlife Refuge: Aquatic Habitat and Wildlife-Viewing Improvements, Citrus County, Florida.”
- Standards of Conduct, including the 12 Prohibitions, increases in-water visitor compliance with rules and guidelines that minimize manatee viewing-related disturbance when supervised by certified guides.

*Data:* Observations by Refuge staff, seasonal manatee inventory data, Tour Operator Visitor Reports (2014-15 visitor numbers), boardwalk visitors’ survey including visitor numbers, crowding assessments, and visitor feedback

**4) A photography/videography SUP will be required for any person or activity that involves images captured from below the waters’ surface. All flash photography will be prohibited inside the Springs unless issued a separate SUP for specific use of any artificial lighting. These permit holders will be required to be accompanied by a FWS-certified in-water guide. The guide will be required to provide a complete orientation and will help ensure that photographic activities will not disturb resting or nursing manatees.**

*Purpose:* The purpose of this action is to minimize the effects of commercial photographers, videographers, and flash photography on manatees. Photographers may approach and engage in activities that can disturb manatees while photographing manatees. Camera flashes may startle manatees and disturb normal behaviors. Requiring and limiting the number of SUPs issued to photographers will reduce the potential for photography-related manatee disturbance. A prohibition on flash photography will minimize flash-related manatee disturbance. Currently, the Service’s Division of Management Authority’s permitting requires a 20-foot minimum approach distance from any manatee when using any artificial photographic lighting. This, combined with a robust SUP training program and limits on the number of SUPs for photographers, should reduce the potential for adverse effects of photographic activities.

Justifications:

- Reduces the potential for compromising manatee behavior due to photographers and flash photography.
- Complies with existing Service policies and guidelines.

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*Data:* Scientific literature review. Observations by Refuge staff,

**5) Close two lobes (Pretty Sister and Little Sister) to in-water access during manatee season, as needed, in response to key environmental factors, i.e. numbers of manatees present, temperatures, and tides.**

*Purpose:* The physiology of manatees requires that they thermoregulate in the warmer waters of the Springs during the colder winter months, beginning when Gulf water temperatures start to drop. Manatees prefer shallow areas in order to conserve energy when surfacing to breathe while resting on the bottom. This is especially true of mother/calf pairs. Closing the shallow eastern and western lobes of the springs during these times allows manatees to seek refuge in undisturbed 'sanctuaries' within the Springs themselves. As temperatures drop and manatee numbers increase, this measure allows for additional adaptive measures.

*Justifications:*

- Creates protected areas for resting manatees, including cow/calf pairs, as needed. (Staff has documented that these two shallow lobes are where the majority of manatees rest, sleep, and nurse their calves.)
- Reduces the potential to alter manatee behavior by in-water viewing activities.
- Monitoring manatee usage allows management measures to be adaptive based on observations.

*Data:* Staff observations, and manatee usage pre/post closures of lobes

**6) Institute Standards of Conduct for guides, clients, and in-water visitors that support and promote responsible, sustainable wildlife viewing.**

*Purpose:* Each wildlife-dependent recreational activity must be determined to be appropriate and compatible on a NWR (i.e. an activity cannot materially interfere with or detract from the fulfillment of the NWR System mission or the Refuge's specific purposes. Wildlife disturbance that is limited in scope or duration may not interfere with fulfilling the System's mission or refuge purposes. By instituting Standards of Conduct and training program, refuge managers can ensure fulfillment of the Refuge mission while providing oversight for SUP holders and vendors operating on refuge managed lands.

*Justifications:*

- Improves the quality of wildlife viewing experiences while reducing the potential for manatee viewing-related disturbance.
  - Increases SUP holder knowledge of their responsibilities while operating on NWR property.
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**7) Prohibit pets on the boardwalk, shoreline, or in the water at Three Sisters Springs, including the spring run.**

Purpose: Animal waste washed into waterways during storm events can expose manatees to harmful pathogens. Researchers recently documented toxoplasmosis in manatees in Puerto Rico, a disease likely introduced by the surface runoff of cat feces into waterways inhabited by manatees (Bossart 2014). To reduce the likelihood of disease exposure to manatees at Three Sisters Springs, CRNWR will prohibit pets on the boardwalk, shoreline, and in the water. Exceptions will be made for service animals.

Justifications:

- Reduces risk of potential epizootic disease transmission from domestic pets to manatees.

*Data:* Scientific literature review.

**8) Build an elevated viewing platform(s) to enhance wildlife-viewing and manatee photography opportunities and improve the existing boardwalk for safety reasons and to comply with the Americans with Disability Act (ADA).**

Purpose: To enhance manatee viewing and photography opportunities, CRNWR will build an elevated viewing platform along the southwestern shore of the Springs. The elevated platform will allow visitors to view and photograph manatees from a vantage point above the shorelines' fringing vegetation, which obscures views. The existing boardwalk will be re-engineered to provide non-slip surfaces to improve safety and railings will be constructed to provide mobility-impaired visitors with views of the Springs. .

Justifications:

- Improve and diversify wildlife viewing and photography opportunities.
- Safer construction eliminates safety risks.

*Data:* Engineering review.

**X. Explanation of Effects of the Action on Species in Section VI:**

*West Indian manatee*

The proposed measures will minimize the effect that visitor activities and increasing numbers of visitors may have on manatees. These will supplement existing management measures and provide better control of human activities when manatees are present in Three Sisters Springs. Specifically:

- 
- Measure 1 restricts in-water access through the spring run and only allows accessibility from shore. This will keep in- and on-water recreationists from blocking manatees entering and leaving the Springs in the spring run.
  - Measure 2 will limit the number of in-water visitors viewing manatees within the Springs. Limiting the number of visitors will reduce the number of visitor interactions with manatees. Limited numbers of visitors accessing the Springs will be accompanied by a Refuge-certified guide who will ensure that manatee viewing activities do not disturb manatees. Restricting access from the shore only, reducing visitor numbers, and ensuring that guided visitors do not disturb manatees will minimize potential manatee viewing-related harassment.
  - Measure 3 will require Refuge-certified guides to accompany and supervise in-water visitors while in the Springs. Certified guides will be knowledgeable about responsible manatee viewing, including regulations. They will ensure that the actions of their clients do not have the potential to disturb manatees.  
E.
  - Measure 4 minimizes the potential for in-water photographers/videographers and flash photography to disturb manatees. By requiring photographers to have SUPs, by conditioning the SUPS to minimize manatee disturbance, by limiting the number of SUPs issued to photographers, and by prohibiting flash photography, manatee disturbance will be minimized.
  - Measure 5 adopts lobe closures within the Springs. These closures will keep visitors out of these areas and will allow manatees to remain here undisturbed by human activities.
  - Measure 6 adopts Standards of Conduct for 4 guides, and visitors that promotes responsible manatee viewing. The Standards will ensure that manatee-viewing activities are appropriate and compatible with the Refuge mission and purposes.
  - Measure 7 prohibits pets from the boardwalk, shoreline, and in the water at Three Sisters Springs (except for service animals). By prohibiting pets from these locations, animal waste will be prevented from running off into the Springs where it can expose manatees to diseases.  
F.
  - Measure 8 constructs elevated viewing platform(s), improves boardwalk safety, and ensures that the structures are ADA compliant. These actions improve viewing opportunities and safety.
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Because the confined springs at Three Sisters Springs are one of the few wintering manatee aggregation areas where in-water human access is not controlled, inappropriate interactions between humans and manatees can occur. Based on the Service's Biological Evaluation, we conclude that implementation of the measures proposed in Alternative D of the EA, along with continued efforts by Refuge Law Enforcement, will reduce the likelihood of visitor harassment at this site to insignificant or discountable levels by reducing the potential for close interactions between humans and manatees. The way in which these measures will reduce the likelihood of visitor harassment is explained in the latter part of Chapter 2 of the EA (section title: *Effects to Biological Environment*).

Implementation of these measures will not directly or indirectly affect on-site critical habitat elements such as drinking water and warm water.

*Wood storks*

Wood storks are rarely on-site and when present may roost in fringing trees. There are little to no shallow foraging areas along the shoreline. Given that these measures address in-water activities where wood storks are not found, implementation of these measures should have no measurable effects on wood storks that may be in the area.

*Eastern indigo snakes*

No eastern indigo snakes are known from this site. As such, implementation of in-water measures should have no measurable effects on eastern indigo snakes that may be in the area.

*American alligator*

Because this species is not known to frequent Three Sisters Springs, the likelihood of disturbance is low.

**A. Explanation of actions to be implemented to reduce adverse effects:**

*West Indian manatee*

Implementation of these measures should benefit manatees that use the area. As a result, these actions are not expected to adversely affect manatees using the action area or to designated critical habitat.

*Wood storks*

Given that use of the action area by wood storks is limited to a few roost trees, and the proposed actions are in-water related, the actions are not expected to adversely affect wood storks.

*Eastern indigo snakes*

Given that use of the action area by eastern indigo snakes is not known to occur and the proposed actions are in-water related, the actions are not expected to adversely affect this species.

*American alligator*

]

This species is infrequently seen in the action area and critical habitat has not been designated. Implementation of the proposed action is not expected to adversely affect the species.

**XI. Effect determination and response requested:**

**A. Species**

Species	Determination			Response Requested
	No Effect	Not Likely to Adversely Affect	May Affect	Concur
West Indian manatee		X		
Wood stork		X		
Eastern indigo snake		X		
American alligator		X		

**B. Designated critical habitat**

Species	Determination			Response Requested
	No Effect/ No Adverse Modification	Not Likely to Adversely Affect	May Affect	Concur
West Indian manatee	X			

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Signature \_\_\_\_\_

\_\_\_\_\_ Date

(Title/office of supervisor at originating station)

**XII. Reviewing Ecological Services Office Evaluation:**

A. **Concurrence** \_\_\_\_\_ **Non-concurrence** \_\_\_\_\_

B. **Formal consultation required** \_\_\_\_\_

C. **Conference required** \_\_\_\_\_

D. **Informal conference required** \_\_\_\_\_

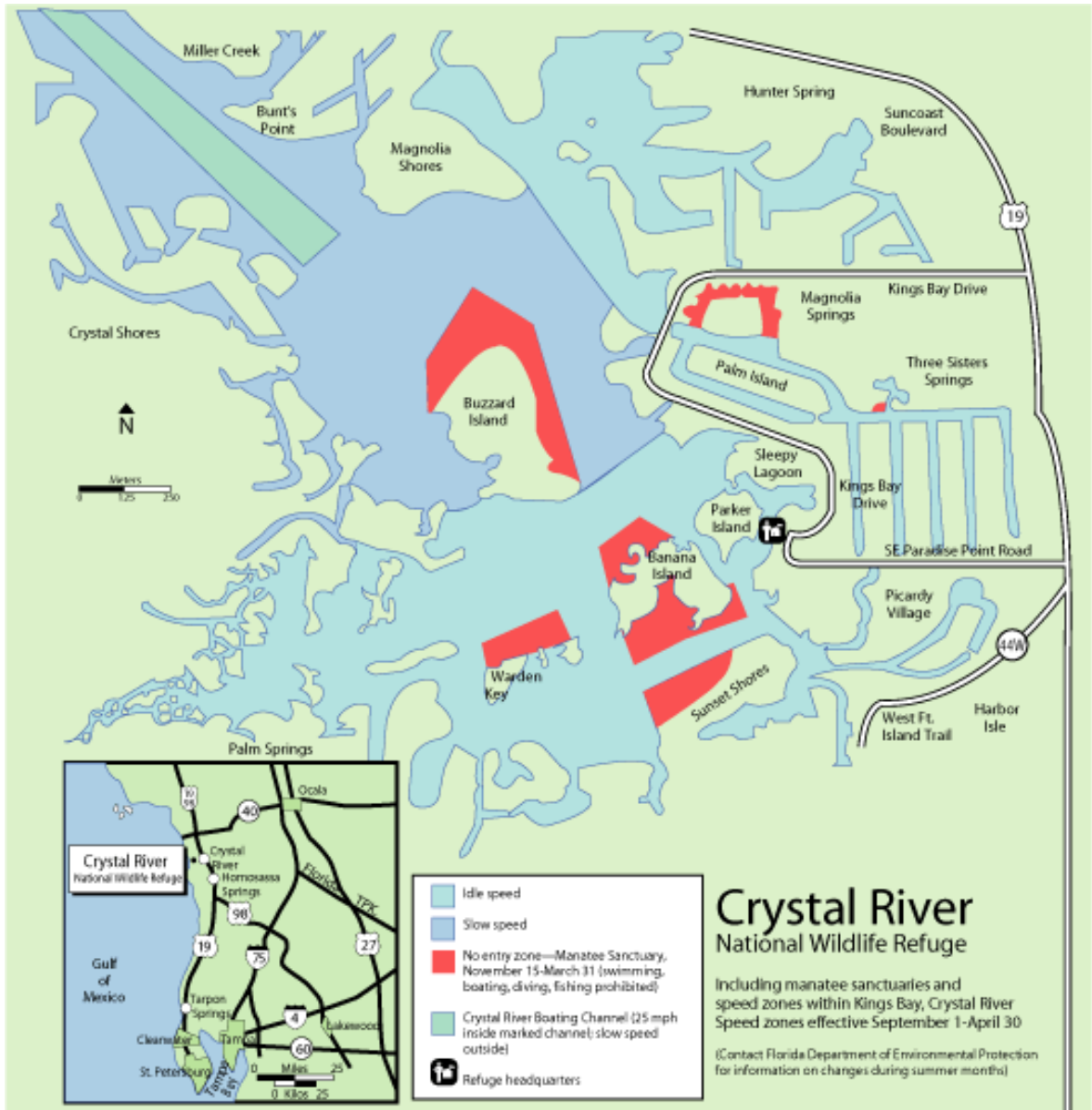
E. **Remarks:** none

Signature \_\_\_\_\_

\_\_\_\_\_ Date

(Title/office of supervisor)

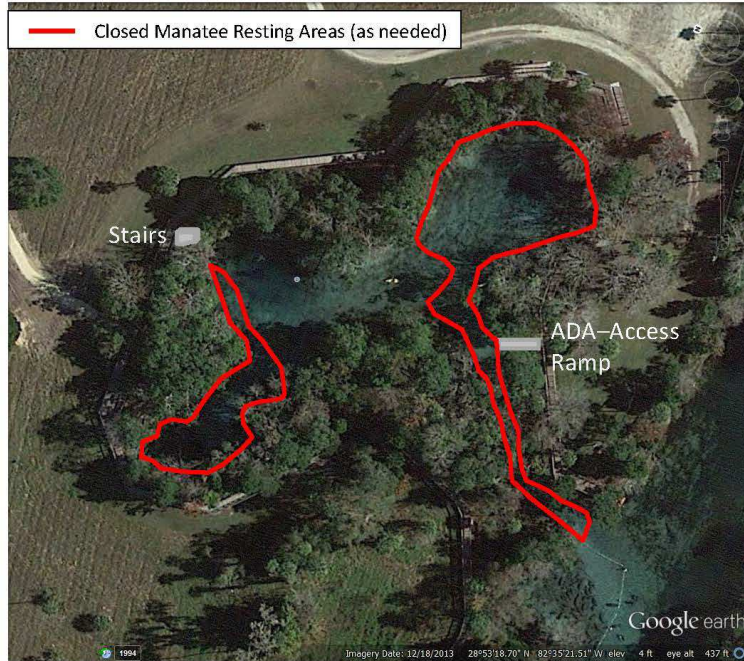
Map 1. Location.



G.



Map 2. Proposed no-entry areas within the spring heads in the eastern and western lobes (Pretty Sister and Little Sister, respectively) located on Three Sisters Springs.



## Appendix C: Appropriate Use Determinations

### FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Crystal River National Wildlife Refuge

Use: In-Water, Guided Manatee Viewing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	x	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	x	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	x	
(d) Is the use consistent with public safety?	x	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	x	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	x	
(g) Is the use manageable within available budget and staff?	x	
(h) Will this be manageable in the future within existing resources?	x	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	x	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	x	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes** X **No** \_\_\_

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

**Not Appropriate** \_\_\_ **Appropriate** X \_\_\_

Refuge Manager: \_\_\_\_\_ Date: \_\_\_\_\_

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

**A compatibility determination is required before the use may be allowed.**

## FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Crystal River National Wildlife Refuge

Use: In-Water, Guided Commercial and Nature Photography and Filming (November 15 to March 31)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	x	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	x	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	x	
(d) Is the use consistent with public safety?	x	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	x	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	x	
(g) Is the use manageable within available budget and staff?	x	
(h) Will this be manageable in the future within existing resources?	x	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	x	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	x	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes X No**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

**Not Appropriate**       

**Appropriate**   X  

Refuge Manager: \_\_\_\_\_

Date: \_\_\_\_\_

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: \_\_\_\_\_

Date: \_\_\_\_\_

**A compatibility determination is required before the use may be allowed.**

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## Appendix D. Compatibility Determinations



### **COMPATIBILITY DETERMINATION** **Three Sisters Springs Unit,** **Crystal River National Wildlife Refuge**

**Introduction:** Lands and waters within National Wildlife Refuge System (NWRS) are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is one that, in the sound professional judgment of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the mission of the NWRS or the purposes of the Refuge. All programs and uses must be evaluated based on the mandates set forth in the National Wildlife Refuge Improvement Act of 1997, as follows (16 U.S.C. §668dd-668ee). Uses must:

- Contribute to ecosystem management goals, as well as Refuge purposes and goals;
- Conserve, manage, and/or restore fish, wildlife, and plant resources and their habitats;
- Monitor the health and population trends of fish, wildlife, and/or plants;
- Manage and ensure appropriate visitor uses as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and,
- Ensure that visitor activities are compatible with Refuge purposes.

National Wildlife Refuge Improvement Act further identifies six priority wildlife-dependent recreational uses. These are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. As priority public uses on the NWRS, they receive priority consideration over other public uses in planning and management.

The Crystal River National Wildlife Refuge's public use program will be reviewed annually to ensure that it contributes to Refuge objectives in managing quality recreational opportunities and protecting habitats, and is subject to modification if on-site monitoring by refuge staff or other authorized personnel results in unanticipated negative impacts to natural communities, wildlife species, or their habitats. Refuge law enforcement officer(s) will promote compliance with Refuge regulations, monitor public use patterns and public safety, and, along with staff and volunteers, document visitor uses. Refuge law enforcement personnel will monitor all closed areas and enforce all applicable State and Federal regulations

**USE:** In-Water, Guided Manatee Viewing (hereafter referred to as snorkeling)  
(November 1 to April 15)

**REFUGE NAME:** Crystal River National Wildlife Refuge, Three Sisters Springs Unit

**COUNTY:** Citrus County, Florida

**DATE ESTABLISHED:** January 10, 1983 (Refuge); July 28, 2010 (Unit)

**ESTABLISHING AND ACQUISITION AUTHORITIES:**

- 16 U.S.C. §461k-1 (**Refuge Recreation Act of 1962**).
  - **The National Wildlife Refuge System Administration Act of 1966**, as amended by the **National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)**, allows National Wildlife Refuges to provide for compatible wildlife dependent recreation and requires
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National Wildlife Refuges to manage for the conservation of fish, wildlife, and habitat for present and future generations of Americans.

- 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 Florida subspecies (*Trichechus manatus latirostris*) "...to conserve (A) fish or wildlife which are listed as endangered species or threatened species." 16 U.S.C. §1534 (Endangered Species Act of 1973).
- **50 CFR §17.108** The Springs were included in the Kings Bay Manatee Protection Area Rule which expanded temporary no-entry areas in 2012. This allows the Service to restrict waterborne activities including, but not limited to, swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing, and the use of water vehicles (including boats, personal watercraft, and other vehicles used to move across or underneath the water's surface).
- **The Declaration of Restrictive Covenants** is an agreement entered into between the Florida Communities Trust, a non-regulatory agency within the Florida Department of Environmental Protection (DEP), and the City of Crystal River. The intent of the agreement is to impose the terms and conditions on the use of the proceeds of certain bonds and the lands acquired with such proceeds (the Springs). This agreement is necessary to ensure compliance with the applicable Florida law and federal income tax law and to otherwise implement the provisions of Sections 259.105, 259.1051, and Chapter 380, Part III, Florida Statutes. The Declaration of Restrictive Covenants outlines how the Springs is to be managed for conservation, protection, and enhancement of natural and historical resources and for compatible passive, natural resource-based public outdoor recreation, along with other related uses necessary for the accomplishment of this purpose
- **The Endangered Species Act of 1973 (ESA)**, as amended, does not specifically address the Refuge System but it does directly affect management activities within the Refuge System. The ESA directs federal agencies to take actions that would further the purposes of the ESA and to ensure that actions they carry out, authorize, or fund do not jeopardize endangered species or their critical habitat. The ESA also provides authority for land acquisition. Conservation of threatened and endangered species has become a major objective of both land acquisition and Refuge management programs.
- **The Marine Mammal Protection Act of 1972 (MMPA)** does not specifically address the Refuge System, but it does directly affect management activities within the Refuge System. The Marine Mammal Protection Act was the first legislation that called for an ecosystem approach to natural resources management and conservation. The MMPA prohibits the 'take' (i.e., hunting, killing, capture, or harassment) of marine mammals, and enacts a moratorium on the import, export, and sale of marine mammal parts and products. The MMPA established federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otters, walruses, polar bears, dugongs, and manatees. Authority to manage marine mammals was divided between the Department of the Interior (delegated to USFWS) and the Department of Commerce (delegated to the National Marine Fisheries Service [NMFS] within the National Oceanic and Atmospheric Administration [NOAA]). A third Federal agency, the Marine Mammal Commission, was later established to

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review and make recommendations on the policies and actions of the Service and NOAA-NMFS related to their implementation of the MMPA.

**REFUGE PURPOSES:** These purposes and the mission of the National Wildlife Refuge System are fundamental to determining the compatibility of proposed uses for the Three Sisters Springs unit (the Springs) of the Crystal River National Wildlife Refuge (NWR). The purposes of the Crystal River NWR are:

“...to conserve threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the Florida subspecies (*Trichechus manatus latirostris*).

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species.” 16 U.S.C. 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 U.S.C. §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 U.S.C. §460k-2 (Refuge Recreation Act, 16 U.S.C. §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 U.S.C. §3901 (B) 100 Stat.3583 (Emergency Wetlands Resources Act of 1986).

**National Wildlife Refuge System Mission:** ...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Administration Act of 1966, as amended) (16 U.S.C. §668dd-668ee).

**DESCRIPTION OF USE:** The Refuge will authorize limited, in-water, guided manatee viewing via snorkeling in designated areas of the Three Sisters Springs Unit of the Crystal River NWR, and will regulate such use through the implementation of a mandatory U.S. Fish and Wildlife guide-training program, including issuance of yearly guide certifications (hereafter referred to as guides).

*(a) Where would the use be conducted?*

This use will be allowed inside the open portions of Three Sisters Spring (the Springs) from November 1 through April 15 via in-water access from a specific, designated area of boardwalk only. Closed areas within the Springs where this use would not be compatible include the spring run and the seasonally closed lobes established for resting and nursing manatees.

*(b) When would the use be conducted?*

In-water, guided manatee viewing would be allowed from 10AM to 4PM between November 1 and April 15 except when the Springs are closed due to cold weather events, manatee presence or aggregations, or public safety issues.

*(c) How would the use be conducted?*

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The City of Crystal River, as part owner of the property, would provide services that promote wildlife dependent, recreational uses in the Springs which are directly related to the requirements of the Declaration of Restrictive Covenants with the Florida Communities Trust, the Management Agreement, the Three Sisters Springs Project Management Plan, the Refuge’s establishing purposes, and the mission of the Service.

The City of Crystal River would serve as the “Municipal Partner” for visitor services at the Three Sisters Springs Unit under a single Special Use Permit (SUP), which will be established by a joint Memorandum of Understanding (MOU) between Crystal River National Wildlife Refuge, Florida Communities Trust and the South Florida Water Management District (SWFWMD). The Municipal Partner will operate visitor services that provide limited, public recreational access, with assistance from guides and educational interpreters. The Municipal Partner will provide these services and support wildlife dependent, sustainable, and appropriate public use activities.

Administration of these activities will be conducted in accordance with the MOU stipulations developed to ensure consistency throughout the Refuge; provide a safe, quality experience; protect resources; and to ensure compliance with pertinent Refuge System regulations and policies.

*(d) Why is this use being proposed?*

One of the priority public uses identified in the National Wildlife Refuge Improvement Act of 1997 is to provide opportunities for the public to develop an appreciation for and knowledge of wildlife wherever and whenever those opportunities are compatible with Refuge purposes. Based on existing visitation at the Springs, the public is willing to pay for the additional environmental expertise and local knowledge provided by commercial businesses and guides. The Springs protects a unique habitat for populations of watchable manatees in a scenic setting. It is expected that demand for guided wildlife observation opportunities in-water, in the Springs will continue to increase.

**AVAILABILITY OF RESOURCES:** Agency administrative costs will include costs associated with developing infrastructure needs to support land-based water access for guides and snorkelers. This will require some additional staff and some construction/maintenance costs which will be shared with the City of Crystal River as the Municipal Partner and are estimated in the Table, below:

Estimated administrative and infrastructure costs associated with in-water, guided manatee viewing.

<b>Anticipated Needs</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total</b>
<b>Staffing</b>			
Maintenance Worker	0.25 x 1	\$40,000	\$10,000
Biological Technician	0.5 x 1	\$32,000	\$16,000
Law Enforcement Officers	0.5 x 2	\$70,000	\$70,000
Interpreter	1 volunteer (4 interpretive stations)	\$500	\$500
Volunteer Coordinator	0.5 x 1	\$21,000	\$10,500
<b>Construction</b>			
Boardwalk	1 (City of Crystal River assists in costs)	\$75,000	\$75,000
Elevated Viewing Platforms	2 (City of Crystal River assists in costs)	\$18,750	\$37,500
Maintenance	(City of Crystal River assists in costs)	\$0	\$15,000
<b>TOTAL</b>			<b>\$234,500</b>

NOTE: Three Sisters Springs would be open 7 days a week from 8AM-5PM.

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**ANTICIPATED IMPACTS OF THE USE:** In-water, guided manatee viewing may result in positive or negative impacts to wildlife resources. A positive effect of allowing snorkeling in the Springs is the provision of additional wildlife-dependent recreational opportunities and a better appreciation and more complete understanding of the wildlife and habitats associated with the broader ecosystem of Crystal River and Kings Bay. Potential disturbance of protected species is the primary concern regarding guided manatee viewing via snorkeling.

The current condition of the Springs' biological environment, including water quality, vegetative communities, and wildlife habitat, likely will not experience any negative impacts from this use. The Springs will be seasonally closed to all in-water access via the narrow spring run from November 15 to March 31 (with designations for closures that may be made prior to November 15 and after March 31 during cold fronts when manatees are present), to prevent potential manatee disturbance. By seasonally closing the Springs to all in-water access via the spring run, paddlecraft would be absent and manatees would be able to enter and exit the Springs with less potential disturbance. Additionally, given the two closed lobes, manatees would be able to rest and nurse their calves undisturbed in these no-entry areas even while limited guided snorkel tours are being conducted.

**PUBLIC REVIEW AND COMMENT:** As part of the NEPA process for Crystal River NWR, the uses described in this compatibility determination underwent extensive public review during a 30-day public review and comment period for the Draft EA, "Three Sisters Springs Unit of Crystal River National Wildlife Refuge: Aquatic Habitat and Wildlife Viewing Improvement – Citrus County, Florida". The Draft EA addressed in-water access, wildlife viewing and other proposed management actions and the public comment was from August 5 to September 4, 2015. In addition, an extensive outreach plan was developed to engage the community before and during the Draft EA comment period. On August 5, 2015 a news release announcing the Draft Environmental Assessment addressing in-water activities and management at Three Sisters Springs and the associated public comment period was provided to the media and to all refuge community contacts, along with an open invitation for the community to attend an informational public meeting to review details of the Draft EA. The informational community-wide public meeting was held on August 12, 2015 where 87 attendees were given a presentation by the Refuge Manager, and given an opportunity to ask questions and receive clarifications on the proposed management actions including the use described in this CD. In addition, an informational meeting for commercial special use permit holders was held on August 11, 2015 where all permit holders were given an opportunity to ask questions after a detailed presentation on the Draft EA by the Refuge Manager. Both informational meetings were announced via local newspapers including the Citrus Chronicle, and via direct invitation to over 800 contacts in the Refuge's mailing list.

**DETERMINATION (CHECK ONE BELOW):**

\_\_\_\_\_ Use is not compatible

\_\_\_ X \_\_\_ Use is compatible, with the following stipulations

**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

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The following stipulations apply to the limited, in-water, guided manatee viewing in the Springs. Impacts of the in-water, guided manatee viewing will continue to be monitored and adjustments made to management and use to prevent disturbance to wildlife, habitats and to other Refuge users and uses. Law enforcement and administrative monitoring of use will continue to ensure compliance with the following conditions, which are incorporated into all management agreements, trainings, and permits to minimize impacts on Refuge lands, waters and natural resources, and to protected species:

- Enforce the current Twelve Prohibitions
  1. No chasing or pursuing of a manatee(s).
  2. No cornering or surrounding of a manatee(s).
  3. No poking, prodding, or stabbing of a manatee(s).
  4. No feeding of a manatee(s).
  5. No riding or holding of a manatee(s).
  6. No grabbing or pinching of a manatee(s).
  7. No disturbing or touching of a resting manatee(s).
  8. No diving on a resting or feeding manatee(s).
  9. No separating of a manatee(s) mother and calf(s).
  10. No actively engaging of a tagged manatee(s) or associated gear.
  11. No entering of manatee sanctuaries.
  12. No standing on a manatee(s).
  
- Promote public and visitor education regarding 'Passive Observation' via 'Manatee Manners' outreach materials.
  
- Prohibit entrance to the Three Sisters Springs property between official sunset and official sunrise.
  
- Prohibit scuba diving and fishing including, but not limited to, fishing by hook and line, by cast net, or by spear.
  
- Continue federal and state law enforcement efforts to cite and prosecute disturbance and harassment of manatees under 50 CFR §17.3 and §18.3, and under ESA and MMPA.
  
- Prohibit pets on the boardwalk, shoreline, and in the water at the Springs and the spring run.
  
- Close all in-water access to the Springs via the narrow spring run, during manatee season (November 15 to March 31) and prior to November 15 and after March 31 during cold fronts when manatees are present.
  
- Guides are required to accompany and supervise snorkelers during in-water tours and the Refuge will standardize guide certification for the Springs, during manatee season, such that:
  - Snorkeling to view manatees would be available during the hours of 9AM and 4PM daily, except during emergency closures.
  
  - Guides would be required to attend an in-water guide training to become USFWS-certified (only certified guides would be allowed to accompany snorkelers in the Springs). Refuge

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personnel would lead these training sessions. All Crystal River NWR staff will also be guide-certified.

- Close two lobes (Pretty Sister and Little Sister) to in-water access during manatee season in response to key environmental factors that suggest potential stress to manatees (i.e., actual or estimated manatee numbers from counts in the Springs and areas at the mouth of the run, tide heights measured within the Springs, and water temperatures measured at the Shell Island USGS weather monitoring station or other ocean/river temperature measurements).
- Limit the maximum number of snorkelers to eight at any given time. One guide would be required to accompany four snorkelers, bringing the total number of people in-water in the Springs to ten at any given time. This number would not include allotted photographers, nor Refuge staff and/or Service-approved SUP holders as needed on a case-by-case basis.
  - Entry into the Springs for mobility impaired snorkelers would be provided via an ADA-compliant access at the southeastern edge of the Springs at the junction of the spring run and Pretty Sister. Entries here would only occur when manatees are not present at or near the spring run.
- Entry into the Springs, for snorkelers will be provided via stairs, only, on the north side of Deep Sister, from the boardwalk, adjoining the existing viewing platform.
- In-water guides will be required to attend a standardized guide-training course to become USFWS-certified. Refuge staff would conduct training sessions and certify guides before each manatee season. All in-water snorkelers would be required to be accompanied and supervised by guides.
- A Standard of Conduct for guides and all snorkelers that supports and promotes responsible, sustainable wildlife viewing will be communicated to and expected of anyone entering the water at any time for any reason. Non-compliance with these Standards of Conduct or with conditions of any issued permits may result in the revocation of the issued permit and/or restrict the issuance of any future permits to the individual permit holders for any use at the Springs. There would be no appeal process associated with the revocation of permit or access privileges.
- The Standard of Conduct for guides, snorkelers and any SUP holders supports and promotes responsible, sustainable wildlife viewing. The general Standards of Conduct for this use are:

General Standards of Conduct (from November 1 – April 15) would include:

- No disposable, single-use plastic or paper containers or other disposable items.
  - No glass bottles.
  - No alcoholic beverages.
  - No smoking.
  - No vessels (motorized or non-motorized) including but not limited to motorized, devices and underwater scooters.
  - No fishing, gigging, spearing, netting.
  - No loud noises (including but not limited to yelling, screaming, or music), or splashing or diving.
  - No standing on, holding, climbing, or hanging from vegetation.
  - No removal of any plant, animal, mineral, or other natural or cultural resource.
  - All trash and food products must be removed from water and/or property (pack-in pack-out).
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- No food or drink (water) is to be made available to wildlife.
  - No scuba diving.
  - No attaching to or altering of any structures, vegetation, or land; apart from designated mooring(s).
  - No phone or camera extension poles allowed.
  - No exchanging of items or any materials between snorkelers and boardwalk visitors including throwing, passing, or handing items between people.
  - No remote control equipment (boats, UAVs, planes, submarines, cameras).
  - No pets allowed inside Three Sisters Springs or on the boardwalk.
  - No dissemination of non-approved information (advertising, flyers, handouts, etc.).
  - No commerce or solicitation of products or services, unless approved by the Refuge.

The in-water manatee viewing Standards of Conduct from November 1 – April 15 are:

- A guide (certified under the USFWS Three Sisters Springs Guide Course) must be in-water guiding snorkelers at all times.
- The USFWS Three Sisters Springs Guide Annual Certification course must be completed, yearly.
- Guides will provide a comprehensive safety, expectations of conduct, and manatee awareness orientation for all snorkelers prior to entering the water.
- Safety orientation will comply with water safety industry standards and manatee awareness and expectations of conduct.
- Orientation will comply with both guide training and USFWS rules and regulations including Manatee Manners.
- The guide is responsible to ensure their snorkelers can calmly and efficiently without disturbing manatees or other wildlife.
- Guide to snorkeler ratio for in-water Refuge activities will be 1 guide for every 4 or fewer snorkelers.
- Guides' and snorkelers' equipment including wetsuit, snorkel, snorkel vest, and mask, will be dark in color. Exceptions will be made on a case-by-case basis for individuals with custom gear.
- Snorkelers may not use fins.
- Guides and Refuge staff may use fins provided they are dark in color.
- For additional buoyancy, guides and snorkelers may use snorkel vests.
- It is strongly recommended that long hair is bound up or under a dark colored swim cap or dive hood.
- All children under 16 years old must be supervised by a responsible adult (at least 18 years old) at a 1 adult: 1 child ratio.
- Guides and snorkelers may only enter and exit the water at approved, designated locations.
- Communications between guides and snorkelers will mainly consist of hand signals; and verbal communication will be kept at a minimal volume and focus on either snorkeler/swimmer safety or manatee awareness.
- All snorkeling activity will be kept on the surface (no diving below the surface).
- No initiating contact with or pursuing manatees or any other wildlife; any interactions with manatees will comply with Manatee Manners (keeping hands at your side, crossed in front or behind the back).
- All snorkelers must stay at least six feet from all manatees (including all resting manatees; manatees rising to the surface for breath; feeding/nursing manatees; and all cow/calf pairs) unless the manatee initiates an approach and interaction.
- Only in cases of emergency may snorkelers stand or walk on the bottom of the Springs.

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- Any photography or videography that may result in any financial gain is prohibited without a separate, pre-approved commercial photography/filming SUP.
  - No artificial lighting will be allowed for photography/filming including but not limited to flash, strobe, and diffused lighting unless under a separate SUP.
  - This use is compatible with the Service allowing additional staff, volunteers, or other authorized personnel in the water on a case-by-case basis, per management discretion for purposes such as, but not limited to, manatee rescue and release, research, environmental education/filming, and habitat restoration.
  - The maximum number of snorkelers allowed in the Springs is continually monitored and evaluated to assure resting and nursing manatees are not disturbed. Should disturbance be documented, the maximum number of snorkelers would be decreased or eliminated as needed to prevent manatee disturbance.
  - As in the past, the Springs may periodically be completely closed to all in-water public access. The Refuge Manager reserves the ability to restrict access to the Springs under 50 CFR §25.21 (e) in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources (i.e., manatees) of the area. The Refuge Manager may close or curtail Refuge uses of all or any part of an opened area to public access and use in accordance with the provisions in CFR §25.21 (e), without advance notice.

#### **JUSTIFICATION:**

Wildlife viewing has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use, provided it is compatible with the purpose for which the Refuge was established. The focus of this Compatibility Determination is to allow for in-water viewing of manatees by snorkelers in the Three Sisters Unit of Crystal River National Wildlife Refuge. As outlined, and given all listed stipulations, the Service determined that limited, guided snorkeling in the Springs does not materially detract from or interfere with the fulfillment of the purposes of the Refuge or the mission of the National Wildlife Refuge System. Snorkeling in the Springs to allow for limited in-water manatee viewing is not expected to adversely impact the biological integrity, diversity, nor environmental health of the Refuge nor the National Wildlife Refuge System, nor potentially disturb any resting manatees.

#### **NEPA Compliance for Refuge Use Description:**

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Draft Environmental Assessment
- Environmental Impact Statement and Record of Decision

#### **References and Literature Cited:**

[Endangered Species Act of 1973](#) ([16 U.S.C. 1531-1544](#), 87 Stat. 884), as amended -- Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 Act had amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926).

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Florida Communities Trust [FCT]. 2010. Three Sisters Spring Project Management Plan. Drafted by the City of Crystal River, the U.S. Fish and Wildlife Service, and the Southwest Florida Water Management District. Florida Communities Trust (FCT) Project #08-088-FF8.

[Marine Mammal Protection Act of 1972](#) (16 U.S.C. 1361 - 1423h, 86 Stat. 1027), Public Law 92-522, approved October 21, 1972, as amended 2007.

National Wildlife Refuge System Administration Act of 1966, as amended. (16 U.S.C. §668dd-668ee).

Solomon, B. D, C. M. Corey-Luse, and K. E. Halvorsen. 2004. The Florida manatee and eco-tourism: toward a safe minimum standard. *Ecological Economics* 50:101-115.

U.S. Fish and Wildlife Service (USFWS). 2001. Florida manatee (*Trichechus manatus latirostris*) recovery plan, third revision. USFWS. Atlanta, Georgia. 144 pp. + appendices.

USFWS. 2007. West Indian Manatee (*Trichechus manatus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Southeast Region. Jacksonville Ecological Services Office, Jacksonville, Florida. Caribbean Field Office, Boqueron, Puerto Rico. 79 pp.

USFWS. 2010. Commercial SUP Visitor Reports for Crystal River National Wildlife Refuge (CRNWR).

USFWS. 2013. Manatee Manners Outreach Materials. Crystal River National Wildlife Refuge.

USFWS. 2014. Public Use Survey, 2009-2014. Crystal River National Wildlife Refuge.

USFWS. 2014. Commercial SUP Visitor Reports for CRNWR.

USFWS. 2015. Seasonal Report; Results of the 2015 Human and Manatee Research Projects. Crystal River National Wildlife Refuge.

USFWS. 2015. Final Emergency Environmental Assessment for Manatee Wildlife Viewing, Three Sisters Springs, Crystal River NWR, Florida 36 pp.

Wolfe, C. and R. E. Syverson. (In prep.). Manatees, People, and Three Sisters Springs. Crystal River National Wildlife Refuge Complex.

**Approval of Compatibility Determination**

**SIGNATURE: Refuge Manager,**  
**Crystal River NWR:** \_\_\_\_\_  
 (Signature/Date)

**REVIEW: Project Leader,**  
**North Florida NWR**  
**Complex** \_\_\_\_\_  
 (Signature/Date)

**REVIEW: Regional Compatibility**  
**Coordinator,**  
**Southeast Region:** \_\_\_\_\_  
 (Signature/Date)

**CONCURRENCE: Regional**  
**Chief,**  
**Southeast Region:** \_\_\_\_\_  
 (Signature/Date)

**MANDATORY 10 YEAR REEVALUATION DATE:**

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## **COMPATIBILITY DETERMINATION**

### **Three Sisters Springs Unit, Crystal River National Wildlife Refuge**

**Introduction:** Lands and waters within National Wildlife Refuge System (NWRS) are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is one that, in the sound professional judgment of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the mission of the NWRS or the purposes of the Refuge. All programs and uses must be evaluated based on the mandates set forth in the National Wildlife Refuge Improvement Act of 1997, as follows (16 U.S.C. §668dd-668ee). Uses must:

- Contribute to ecosystem management goals, as well as Refuge purposes and goals;
- Conserve, manage, and/or restore fish, wildlife, and plant resources and their habitats;
- Monitor the health and population trends of fish, wildlife, and/or plants;
- Manage and ensure appropriate visitor uses as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and,
- Ensure that visitor activities are compatible with Refuge purposes.

National Wildlife Refuge Improvement Act further identifies six priority wildlife-dependent recreational uses. These are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. As priority public uses on the NWRS, they receive priority consideration over other public uses in planning and management.

The Crystal River National Wildlife Refuge's public use program will be reviewed annually to ensure that it contributes to Refuge objectives in managing quality recreational opportunities and protecting habitats, and is subject to modification if on-site monitoring by refuge staff or other authorized personnel results in unanticipated negative impacts to natural communities, wildlife species, or their habitats. Refuge law enforcement officer(s) will promote compliance with Refuge regulations, monitor public use patterns and public safety, and, along with staff and volunteers, document visitor uses. Refuge law enforcement personnel will monitor all closed areas and enforce all applicable State and Federal regulations

**USE:** In-Water, Guided Commercial and Nature Photography and Filming  
(November 1 to April 15)

**REFUGE NAME:** Crystal River National Wildlife Refuge, Three Sisters Springs Unit  
**COUNTY:** Citrus County, Florida

**DATE ESTABLISHED:** January 10, 1983 (Refuge); July 28, 2010 (Unit)

**ESTABLISHING AND ACQUISITION AUTHORITIES:**

- 16 U.S.C. §461k-1 (**Refuge Recreation Act of 1962**).
  - **The National Wildlife Refuge System Administration Act of 1966**, as amended by the **National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)**, allows National Wildlife Refuges to provide for compatible wildlife dependent recreation and requires
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National Wildlife Refuges to manage for the conservation of fish, wildlife, and habitat for present and future generations of Americans.

- 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 Florida subspecies (*Trichechus manatus latirostris*) "...to conserve (A) fish or wildlife which are listed as endangered species or threatened species." 16 U.S.C. §1534 (Endangered Species Act of 1973).
- **50 CFR §17.108** The Springs were included in the Kings Bay Manatee Protection Area Rule which expanded temporary no-entry areas in 2012. This allows the Service to restrict waterborne activities including, but not limited to, swimming, diving (including skin and scuba diving), snorkeling, water skiing, surfing, fishing, and the use of water vehicles (including boats, personal watercraft, and other vehicles used to move across or underneath the water's surface).
- **The Declaration of Restrictive Covenants** is an agreement entered into between the Florida Communities Trust, a non-regulatory agency within the Florida Department of Environmental Protection (DEP), and the City of Crystal River. The intent of the agreement is to impose the terms and conditions on the use of the proceeds of certain bonds and the lands acquired with such proceeds (the Springs). This agreement is necessary to ensure compliance with the applicable Florida law and federal income tax law and to otherwise implement the provisions of Sections 259.105, 259.1051, and Chapter 380, Part III, Florida Statutes. The Declaration of Restrictive Covenants outlines how the Springs is to be managed for conservation, protection, and enhancement of natural and historical resources and for compatible passive, natural resource-based public outdoor recreation, along with other related uses necessary for the accomplishment of this purpose
- **The Endangered Species Act of 1973 (ESA)**, as amended, does not specifically address the Refuge System but it does directly affect management activities within the Refuge System. The ESA directs federal agencies to take actions that would further the purposes of the ESA and to ensure that actions they carry out, authorize, or fund do not jeopardize endangered species or their critical habitat. The ESA also provides authority for land acquisition. Conservation of threatened and endangered species has become a major objective of both land acquisition and Refuge management programs.
- **The Marine Mammal Protection Act of 1972 (MMPA)** does not specifically address the Refuge System, but it does directly affect management activities within the Refuge System. The Marine Mammal Protection Act was the first legislation that called for an ecosystem approach to natural resources management and conservation. The MMPA prohibits the 'take' (i.e., hunting, killing, capture, or harassment) of marine mammals, and enacts a moratorium on the import, export, and sale of marine mammal parts and products. The MMPA established federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otters, walruses, polar bears, dugongs, and manatees. Authority to manage marine mammals was divided between the Department of the Interior (delegated to USFWS) and the Department of Commerce (delegated to the National Marine Fisheries Service [NMFS] within the National Oceanic and Atmospheric Administration [NOAA]). A third Federal agency, the Marine Mammal Commission, was later established to

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review and make recommendations on the policies and actions of the Service and NOAA-NMFS related to their implementation of the MMPA.

**REFUGE PURPOSES:** These purposes and the mission of the National Wildlife Refuge System are fundamental to determining the compatibility of proposed uses for the Three Sisters Springs unit (the Springs) of the Crystal River National Wildlife Refuge. The purposes of the Crystal River NWR are:

“...to conserve threatened and endangered species, specifically focusing on the West Indian manatee (*Trichechus manatus*) and more specifically the Florida subspecies (*Trichechus manatus latirostris*).

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species.” 16 U.S.C. §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 U.S.C. §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 U.S.C. §460k-2 (Refuge Recreation Act, 16 U.S.C. §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 U.S.C. 3901 (B) 100 Stat.3583 (Emergency Wetlands Resources Act of 1986).

**National Wildlife Refuge System Mission:** ...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Administration Act of 1966, as amended) (16 U.S.C. §668dd-668ee).

**DESCRIPTION OF USE:** The Refuge will authorize guided, in-water, commercial photography, either still or motion pictures, of wildlife, or nature scenes for conservation uses in the Three Sisters Springs Unit of the Crystal River NWR.

This use typically involves creating a documentary film, taking still photographs, or recording wildlife sounds that are intended to be or could be sold for income or revenue or traded for goods or services. Commercial recording of natural, historic, or cultural subjects are covered under this Compatibility Determination (CD). This CD does not apply to legitimate news media activities.

Each request for this use will be entered into a lottery system and if selected via lottery, will be issued a Special Use Permit (SUP) by the Refuge Manager. Each request, via lottery entry, must be presented in writing with details of who, what, where, when, why, and how the commercial operation will be conducted. The Refuge Manager will use professional judgment and ensure that the photography or filming project will not disturb manatees nor have any considerable negative impacts to natural, cultural, or visitor services, and does not violate Refuge regulations, and contributes to the achievement of the Refuge purpose or the Refuge System mission. All photography or filming lottery applications and SUPs will outline the framework in which the use can be conducted and Refuge staff will ensure compliance with the Standards of Conduct.

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Commercial photography is a popular enterprise in the Springs due to the scenic natural habitats and abundant wildlife including protected manatees. Refuge staff anticipates an increase in commercial photography interest and applications over the coming years as the Refuge continues to gain attention.

*(a) Where would the use be conducted?*

The use will be conducted inside the open water portions of Three Sisters Spring from November 1 through April 15 via in-water access from a specific, designated area of the boardwalk only.

*(b) When would the use be conducted?*

In-water access would be available for this use from 8AM to 5PM, -- providing one hour earlier and later access than is otherwise provided to allow for optimal light and water clarity conditions for photography -- on Monday, Tuesday, Wednesday, and Thursday and from 10AM to 4PM on Friday, Saturday, and Sunday. Access would be restricted Friday through Sunday for all in-water use to enhance the viewing experience of visitors viewing manatees from the Springs' boardwalk.

*(c) How would the use be conducted?*

Commercial photographers and filmers will apply for a SUP for this use via a pre-season lottery system. All commercial photographers and filmers (and one assistant), selected via lottery, would be provided a SUP with Standards of Conduct, a time slot for their use and a trained guide. Commercial photographers and commercial film companies would be required to apply for an additional SUP to gain access to Refuge closed areas, whether temporary or permanent. In addition, these permit holders would be required to be accompanied by a USFWS-certified in-water guide. The guide would be required to provide a complete orientation and would help ensure that photographic activities would not disturb resting or nursing manatees.

The City of Crystal River would serve as the "Municipal Partner" for all visitor access and operations at Three Sisters Springs under a single Special Use Permit (SUP) which will be established by a joint Memorandum of Understanding (MOU) between Crystal River National Wildlife Refuge, Florida Communities Trust and the South Florida Water Management District (SWFWMD). The Municipal Partner will operate visitor services that provide limited, public in-water access to the Springs, with assistance from guides and educational interpreters. The Municipal Partner will provide for public access supports wildlife dependent, sustainable, and appropriate public use activities.

*(d) Why is this use being proposed?*

One of the priority public uses identified in the National Wildlife Refuge Improvement Act of 1997 is to provide opportunities for the public to develop an appreciation for and knowledge of wildlife wherever those opportunities are compatible with Refuge purposes including through photography. Based on existing visitation at the Springs, commercial photographers and filmers are willing to pay for the additional environmental expertise and local knowledge provided by guides. The Springs protects a unique habitat for populations of wildlife in a scenic, popular setting, ideal for photography and filming. It is expected that demand for guided wildlife photography and filming opportunities in-water, in the Springs will continue to increase.

**AVAILABILITY OF RESOURCES:** Agency administrative costs include those associated with developing, maintaining and operating infrastructure to support land-based water access for guides, snorkelers, and commercial photographers/filmers; and a lottery system for photographers/filmers. This will require some additional staff and some construction and maintenance costs which would be shared with the City of Crystal River as the Municipal Partner and are estimated in the Table, below:

Estimated administrative and infrastructure costs associated with in-water, guided manatee viewing.

<b>Anticipated Needs</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Total</b>
<b>Staffing</b>			
Maintenance Worker	0.25 x 1	\$40,000	\$10,000
Biological Technician	0.5 x 1	\$32,000	\$16,000
Law Enforcement Officers	0.5 x 2	\$70,000	\$70,000
Interpreter	1 volunteer (4 interpretive stations)	\$500	\$500
Volunteer Coordinator	0.5 x 1	\$21,000	\$10,500
<b>Construction</b>			
Boardwalk	1 (City of Crystal River assists in costs)	\$75,000	\$75,000
Elevated Viewing Platforms	2 (City of Crystal River assists in costs)	\$18,750	\$37,500
Maintenance	(City of Crystal River assists in costs)	\$0	\$15,000
<b>TOTAL</b>			<b>\$234,500</b>

NOTE: Three Sisters Springs would be open 7 days a week from 8AM-5PM.

### **ANTICIPATED IMPACTS OF THE USE:**

Commercial wildlife and nature filming and photography can result in both positive and negative impacts to the wildlife resource. Visitors engaging in commercial photography are expected to abide by the Refuge's Standards of Conduct. To minimize disturbance to manatees and natural resources and ensure public safety, the Refuge will provide and require a guide for all commercial photography/filming in the Springs. Facilities most utilized by refuge visitors engaging in commercial photography/filming are roads, parking lots, and the boardwalk. Improvement and maintenance of these facilities will cause negligible to short-term minor impacts to localized soils. Impacts are expected to be negligible based on our observations of past visitor uses.

Commercial filming and photography is expected to have negligible adverse short-term, long-term, or cumulative impacts on protected manatees resting in the Springs. To minimize any potential temporary or minor manatee disturbance from this use, the Refuge has designated two closed lobes in the Springs, on a seasonal basis, with no exceptions made to any in-water commercial photography/filming activity allowed in these areas without an additional SUP on a case-by-case basis.

Additionally, commercial filming and photography is expected to have negligible adverse short-term, long-term, or cumulative impacts on marsh and waterbirds, and waterfowl associated with the Springs' shorelines. Negligible adverse short-term, long-term, or cumulative impacts on adjacent land birds are expected as a result of this use.

Commercial filming and photography is expected to have negligible adverse short-term, long-term, or cumulative impacts on small mammals and fishes in the Springs. While developing this compatibility determination, we evaluated the use for its potential to benefit or adversely affect shoreline plants and submerged aquatic vegetation in the Springs; affects were determined to be negligible.

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Moderate beneficial impacts are expected from this use by providing opportunities to enhance public appreciation of the Springs' habitat. Some conflict between Refuge visitors viewing manatees from the boardwalk and photographers operating in the Springs is expected but, overall, limited guided commercial photography and filming is a non-consumptive use and is expected to have minimal impacts on wildlife and habitats in the Springs.

**PUBLIC REVIEW AND COMMENT:** As part of the NEPA process for Crystal River NWR, the uses described in this compatibility determination underwent extensive public review during a 30-day public review and comment period for the Draft EA, "Three Sisters Springs Unit of Crystal River National Wildlife Refuge: Aquatic Habitat and Wildlife Viewing Improvement – Citrus County, Florida". The Draft EA addressed in-water access, wildlife viewing and other proposed management actions and the public comment was from August 5 to September 4, 2015. In addition, an extensive outreach plan was developed to engage the community before and during the Draft EA comment period. On August 5, 2015 a news release announcing the Draft Environmental Assessment addressing in-water activities and management at Three Sisters Springs and the associated public comment period was provided to the media and to all refuge community contacts, along with an open invitation for the community to attend an informational public meeting to review details of the Draft EA. The informational community-wide public meeting was held on August 12, 2015 where 87 attendees were given a presentation by the Refuge Manager, and given an opportunity to ask questions and receive clarifications on the proposed management actions including the use described in this CD. In addition, an informational meeting for commercial special use permit holders was held on August 11, 2015 where all permit holders were given an opportunity to ask questions after a detailed presentation on the Draft EA by the Refuge Manager. Both informational meetings were announced via local newspapers including the Citrus Chronicle, and via direct invitation to over 800 contacts in the Refuge's mailing list.

**DETERMINATION (CHECK ONE BELOW):**

- Use is not compatible
- Use is compatible, with the following stipulations

**STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:**

The following stipulations apply to in-water, guided wildlife photography and filming in the Springs. Impacts of this use will continue to be monitored and adjustments made to management and use to prevent conflicts with wildlife, impacts to habitats and to other Refuge users and uses. Law enforcement and administrative monitoring of this use will continue for compliance with the following conditions, which are incorporated into all management agreements, trainings, and permits to minimize impacts on Refuge lands, waters and natural resources, and to protected species:

- Enforce the current Twelve Prohibitions
  1. No chasing or pursuing of a manatee(s).
  2. No cornering or surrounding of a manatee(s).
  3. No poking, prodding, or stabbing of a manatee(s).
  4. No feeding of a manatee(s).
  5. No riding or holding of a manatee(s).
  6. No grabbing or pinching of a manatee(s).
  7. No disturbing or touching of a resting manatee(s).

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8. No diving on a resting or feeding manatee(s).
  9. No separating of a manatee(s) mother and calf(s).
  10. No actively engaging of a tagged manatee(s) or associated gear.
  11. No entering of manatee sanctuaries.
  12. No standing on a manatee(s).
- Promote public and visitor education regarding 'Passive Observation' via 'Manatee Manners' outreach materials.
  - Prohibit entrance to the Three Sisters Springs property between official sunset and official sunrise.
  - Prohibit scuba diving with photography; prohibit the use of camera extension devices.
  - Continue federal and state law enforcement efforts to cite and prosecute disturbance and harassment of manatees under 50 CFR §17.3 and §18.3, and under ESA and MMPA.
  - Close all in-water access to the Springs via the narrow spring run, during manatee season (November 1 to April 15) and prior to November 1 and after April 15 during cold fronts when manatees are present.
  - Require USFWS-certified to accompany and supervise commercial photographers and filmers in-water such that:
    - All in-water guides for photographers and filmers would be required to attend an in-water guide training to become USFWS-certified (only certified guides would be allowed to accompany snorkelers in the Springs). Refuge personnel would lead these training sessions.
  - Close two lobes (Pretty Sister and Little Sister) to in-water access during manatee season in response to key environmental factors that suggest potential stress to manatees (i.e., actual or estimated manatee numbers from counts in the Springs and areas at the mouth of the run, tide heights measured within the Springs, and water temperatures measured at the Shell Island USGS weather monitoring station or other ocean/river temperature measurements).
  - The maximum number of snorkelers will be eight. One guide would be required to accompany four snorkelers, bringing the average total number people in-water, in the Springs to ten at any given time. This number would not include allotted photographers, nor Refuge staff and/or Service-approved SUP holders as needed on a case-by-case basis.
    - Entry into the Springs for mobility impaired photographers or filmers would be provided via an ADA-compliant access at the southeastern edge of the Springs at the junction of the spring run and Pretty Sister. Entries here would only occur when manatees are not present at or near the access site.
  - Entry into the Springs, for limited permitted access, would be provided via stairs, only, on the north side of Deep Sister adjoining the existing viewing platform.
  - Guides would be required to attend a standardized guide-training course to become
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USFWS-certified. Refuge staff would conduct training sessions and certify guides before each manatee season. All snorkelers will be required to be accompanied and supervised by guides.

- A Standard of Conduct for SUP holders, guides, snorkelers, and any in-water visitors would support and promote responsible, sustainable wildlife-viewing and ecotourism. The general standards of conduct for this use are:

General Standards of Conduct (from November 1 – April 15) would include:

- No disposable, single-use plastic or paper containers or other disposable items.
- No glass bottles.
- No alcoholic beverages.
- No smoking.
- No vessels (motorized or non-motorized) including but not limited to motorized, devices and underwater scooters.
- No fishing, gigging, spearing, netting.
- No loud noises (including but not limited to yelling, screaming, or music), or splashing or diving.
- No standing on, holding, climbing, or hanging from vegetation.
- No removal of any plant, animal, mineral, or other natural or cultural resource.
- All trash and food products must be removed from water and/or property (pack-in pack-out).
- No food or drink (water) is to be made available to wildlife.
- No scuba diving.
- No attaching to or altering of any structures, vegetation, or land; apart from designated mooring(s).
- No phone or camera extension poles allowed.
- No exchanging of items or any materials between in snorkelers and boardwalk visitors including throwing, passing, or handing items between people.
- No remote control equipment (boats, UAVs, planes, submarines, cameras).
- No pets allowed inside Three Sisters Springs or on the boardwalk.
- No dissemination of non-approved information (advertising, flyers, handouts, etc.).
- No commerce or solicitation of products or services, unless approved by the Refuge.

The snorkeling/wildlife viewing Standards of Conduct from November 1 – April 15 are:

- A guide must be in-water with snorkelers at all times.
- The guide certification course must be completed annually.
- Guides will provide a comprehensive safety, expectations of conduct, and manatee awareness orientation for all snorkelers prior to entering the water.
- Safety orientation will comply with water safety industry standards and manatee awareness and expectations of conduct.
- Orientation will comply with both guide training and USFWS rules and regulations including 'Manatee Manners'.
- The guide is responsible to ensure snorkelers are calm in the water without disturbing manatees or other wildlife.
- Guide to snorkeler ratio for in-water Refuge activities will be 1guide:4 or fewer snorkelers.
- Guides' and snorkelers' equipment including wetsuit, snorkel, snorkel vest, and mask, will be dark in color. Exceptions will be made on a case-by-case basis for individuals with custom gear.
- Snorkelers may not use fins.
- Guides and Refuge staff may use fins provided they are dark in color.
- For additional buoyancy, guides and snorkelers may use snorkel vests.

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- It is strongly recommended that long hair is bound up or under a dark colored swim cap or dive hood.
  - All children under 16 years old must be supervised by a responsible adult (at least 18 years old) at a 1 adult: 1 child ratio.
  - Guides and snorkelers may only enter and exit the water at approved, designated locations.
  - Communications between guides and snorkelers will mainly consist of hand signals; and verbal communication will be kept at a minimal volume and focus on either snorkelers' safety or manatee awareness.
  - All snorkeling activity will be kept on the surface (no diving below the surface).
  - No initiating contact with or pursuing manatees or any other wildlife; any interactions with manatees will comply with Manatee Manners (keeping hands at your side, crossed in front or behind the back).
  - All snorkelers must stay at least six feet from all manatees (including all resting manatees; manatees rising to the surface for breath; feeding/nursing manatees; and all cow/calf pairs) unless the manatee initiates an approach and interaction.
  - Only in cases of emergency may snorkelers stand or walk on the bottom of the Springs.
  - Any photography or videography that may result in any financial gain is prohibited without a separate, pre-approved commercial photography/filming SUP.
  - No artificial lighting will be allowed for photography/filming including but not limited to flash, strobe, and diffused lighting unless under a separate SUP.
- Non-compliance with these Standards of Conduct or any conditions of the issued SUPs may result in the revocation of the issued permit and restrict the issuance of any future permits to the individual permit holders for any use at the Springs. There will be no appeal process associated with the revocation of permit(s) and/or access to the Springs.
  - The Service reserves the right to allow additional people/staff/volunteers in the water at the Springs on a case-by-case basis, per management discretion for purposes such as, but not limited to, manatee rescue and release, research, environmental education/filming, and habitat restoration.
  - The maximum number of snorkelers allowed in the Springs will be monitored and evaluated to assure resting and nursing manatees are not disturbed. Should disturbance be documented, the maximum number of snorkelers would be decreased as needed to prevent manatee disturbance.
  - As in the past, the Springs may periodically be completely closed to all in-water public access. The Refuge Manager reserves the ability to restrict access to the Springs under 50 CFR §25.21 (e) in the event of a threat or emergency endangering the health and safety of the public or property or to protect the resources (i.e., manatees) of the area. The Refuge Manager may close or curtail Refuge uses of all or any part of an opened area to public access and use in accordance with the provisions in CFR §25.21 (e), without advance notice.

**JUSTIFICATION:**

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Wildlife photography and filming is a wildlife-dependent recreational activity and is identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use, provided it is compatible with the purpose for which the Refuge was established. The focus of this Compatibility Determination is to allow for limited in-water, guided commercial photography/filming of manatees, other wildlife, and the natural environment in the Three Sisters Unit of Crystal River NWR. As outlined and given all listed stipulations, the Service determined that limited, guided in-water commercial filming and photography in the Springs does not materially detract from or interfere with the fulfillment of the purposes of the Refuge or the mission of the National Wildlife Refuge System. In-water commercial filming and photography in the Springs is not expected to adversely impact the biological integrity, diversity, nor environmental health of the Refuge or the National Wildlife Refuge System, nor potentially disturb any protected species.

#### NEPA Compliance for Refuge Use Description:

Categorical Exclusion without Environmental Action Statement  
 Categorical Exclusion and Environmental Action Statement  
 Draft Environmental Assessment  
 Environmental Impact Statement and Record of Decision

#### References and Literature Cited:

- [Endangered Species Act of 1973](#) ([16 U.S.C. 1531-1544](#), 87 Stat. 884), as amended -- Public Law 93-205, approved December 28, 1973, repealed the Endangered Species Conservation Act of December 5, 1969 (P.L. 91-135, 83 Stat. 275). The 1969 Act had amended the Endangered Species Preservation Act of October 15, 1966 (P.L. 89-669, 80 Stat. 926).
- Florida Communities Trust [FCT]. 2010. Three Sisters Spring Project Management Plan. Drafted by the City of Crystal River, the U.S. Fish and Wildlife Service, and the Southwest Florida Water Management District. Florida Communities Trust (FCT) Project #08-088-FF8.
- [Marine Mammal Protection Act of 1972](#) (16 U.S.C. 1361 - 1423h, 86 Stat. 1027), Public Law 92-522, approved October 21, 1972, as amended 2007.
- National Wildlife Refuge System Administration Act of 1966, as amended. (16 U.S.C. §668dd-668ee).
- Solomon, B. D, C. M. Corey-Luse, and K. E. Halvorsen. 2004. The Florida manatee and eco-tourism: toward a safe minimum standard. *Ecological Economics* 50:101-115.
- U.S. Fish and Wildlife Service (USFWS). 2001. Florida manatee (*Trichechus manatus latirostris*) recovery plan, third revision. USFWS. Atlanta, Georgia. 144 pp. + appendices.
- USFWS. 2007. West Indian Manatee (*Trichechus manatus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Southeast Region. Jacksonville Ecological Services Office, Jacksonville, Florida. Caribbean Field Office, Boqueron, Puerto Rico. 79 pp.
- USFWS. 2010. Commercial SUP Visitor Reports for Crystal River National Wildlife Refuge (CRNWR).
- USFWS. 2013. Manatee Manners Outreach Materials. Crystal River National Wildlife Refuge.
- USFWS. 2014. Public Use Survey, 2009-2014. Crystal River National Wildlife Refuge.
- USFWS. 2014. Commercial SUP Visitor Reports for CRNWR.
- USFWS. 2015. Seasonal Report; Results of the 2015 Human and Manatee Research Projects. Crystal River National Wildlife Refuge.
- USFWS. 2015. Final Emergency Environmental Assessment for Manatee Wildlife Viewing, Three Sisters Springs, Crystal River NWR, Florida 36 pp.
- Wolfe, C. and R. E. Syverson. (In prep.). Manatees, People, and Three Sisters Springs. Crystal River National Wildlife Refuge Complex.

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**Approval of Compatibility Determination**

**SIGNATURE: Refuge Manager,  
Crystal River NWR:** \_\_\_\_\_

**(Signature/Date)**

**REVIEW: Project Leader,  
North Florida NWR  
Complex** \_\_\_\_\_

**(Signature/Date)**

**REVIEW: Regional Compatibility  
Coordinator,  
Southeast Region:** \_\_\_\_\_

**(Signature/Date)**

**CONCURRENCE: Regional  
Chief,  
Southeast Region:** \_\_\_\_\_

**(Signature/Date)**

**MANDATORY 10 YEAR REEVALUATION DATE:**

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## *Appendix E. Acronyms*

ADA	Americans with Disabilities Act
EA	Environmental Assessment
ESA	Endangered Species Act
FDHR	Florida Division of Historical Resources
FWC or FFWCC	Florida Fish and Wildlife Conservation Commission
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Protection Act
NOAA	National Oceanic and Atmospheric Administration
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
SUP	Special Use Permit
SWFWMD	Southwest Florida Water Management District
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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## Appendix F. Information on Preparers

### Preparers:

- Kimberly Sykes, Assistant Refuge Manager, Crystal River NWR Complex, NWRS, SE Region, USFWS
- Samantha Whitcraft, Biological Technician, Crystal River NWR Complex, NWRS, SE Region, USFWS

### Contributors:

- James Burnett, Project Leader, North Florida Refuges, NWRS, SE Region, USFWS
- Ernest Clarke, Assistant Refuge Supervisor, NWRS, SE Region, USFWS
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- Joyce Kleen, Biologist, Crystal River NWR Complex, NWRS, SE Region, USFWS
- Jim Valade, Fish and Wildlife Biologist, North Florida Ecological Services Office, SE Region, USFWS
- Ivan Vicente, Visitor Services Specialist, Crystal River NWR Complex, NWRS, SE Region, USFWS
- Jan Zegarra Fish and Wildlife Biologist, Caribbean Ecological Services Office, SE Region, USFWS

### Reviewers:

- Jack Arnold, Deputy Assistant Regional Director, Ecological Services, SE Region, USFWS
  - Kathleen Burchett, Area II Supervisor, Refuges, NWRS, SE Region, USFWS
  - Sue Cielinski, Planning Chief, NWRS, SE Region, USFWS
  - Cindy Dohner, Regional Director, SE Region, USFWS
  - Mindy Gaetreaux, Deputy Area II Supervisor, Refuges, NWRS, SE Region, USFWS
  - Jay Herrington, Field Supervisor, North Florida Ecological Services Office, SE Region, USFWS
  - Brett Hunter, Deputy Regional Chief, NWRS, SE Region, USFWS
  - Chuck Hunter, Chief, Division of Strategic Resource Management, SE Region, USFWS
  - Tom MacKenzie, Media Relations Specialist and Native American Liaison, External Affairs, SE Region, USFWS
  - Leopold Miranda, Assistant Regional Director, Ecological Services, SE Region, USFWS
  - Mary Morris, Natural Resource Planner, NWRS, SE Region, USFWS (retired)
  - Mike Oetker, Deputy Regional Director, SE Region, USFWS
  - Kristen Peters, Legislative Affairs Specialist, External Affairs, SE Region, USFWS
  - Luis Santiago, Special Agent in Charge, Law Enforcement, SE Region, USFWS
  - Garry Tucker, Chief, Visitor Services, NWRS, SE Region, USFWS
  - Larry Williams, Field Supervisor, Vero Beach Ecological Services Office, SE Region, USFWS
  - Aaron Valenta, Chief, Restoration and Recovery, Ecological Services, SE Region, USFWS
  - David Viker, Regional Chief, NWRS, SE Region, USFWS
-