

History, Acquisition and Current Partnership

- Three Sisters Springs was documented in a 1944 aerial photography prior to development. At that time, the spring group discharged to Kings Bay through a long (more than 3,200 feet), non-navigable, heavily wooded, shallow, braided and poorly defined spring run (creek).
- A manmade canal was constructed in the 1960's to allow for navigable access to Three Sisters Springs.
- Pilings were placed in Three Sisters Springs in 1982 to limit the vessel traffic; the spring run was also lined with large boulders.
- Three Sisters Springs was a naturally a forested wetland. In the 1970s, most trees were removed and an 8-acre pit (where Lake Linda lies today) was dug 40 feet deep to provide fill for the entire property. A 57-acre parcel of land, including the 8-acre Lake Linda, surrounds the springs.
- The Three Sisters Springs property was to be developed with condos, houses, and water was to be commercially extracted and bottled.
- In 2008, The Friends of Crystal River NWR Complex began efforts to save Three Sisters Springs from development. Following a successful partnership consisting of State, Federal and local organizations, Three Sisters Springs was purchased at 10.5 million, which was approximately two million less than fair market value. It was owned by private individuals until July, 2010.
- Three Sisters Springs is now owned by the city of Crystal River and the Southwest Florida Water Management District (SWFWMD).
- The U.S. Fish and Wildlife Service (USFWS), under a lease agreement with the City of Crystal River, manages the Three Sisters Springs as part of the Crystal River National Wildlife Refuge.
- Three Sisters Springs will open to the public after improvements to gate and existing limestone road are made. Projected for November 2014.
- The SWFWMD will begin establishing wetlands and retention ponds on fall of 2014 and is expected to finish by 2015.
- The following have already taken place and/or are still ongoing at Three Sisters Springs since the acquisition in 2010:
 - a) Boulder removal along spring run, to provide for manatee access during low tides
 - b) Construction of boardwalk
 - c) Construction of a pavilion
 - d) Exotic vegetation removal
 - e) Improvement of unpaved access road
 - f) Placement of two temporary parking lots
 - g) Planting of native trees around the springs
 - h) Placement of regulation signs
 - i) Public Use Surveys
 - j) Conceptual plan design for facilities
 - k) Open House events including National Wildlife Refuge Day celebration and other events hosted by the Friends of Crystal River NWR
- The following future facilities and projects are already funded and scheduled to begin this year (2014):
 - a) Erosion stabilization at TSS: \$150,000 by SWFWMD – beginning at end of manatee season
 - b) Bridge to TSS from Cutler Spur Rd: \$345,000 by FLAP – may begin in late 2014.
 - c) Bathrooms and other facilities: There are \$1.2 million available for infrastructure facilities at Three Sisters Springs – to begin in 2014.

Manatee Population Dynamics Shift at Three Sisters Springs 2006 - 2014

- Since 2006, the maximum number of manatees counted in the interior of Three Sisters Springs between November and March, have climbed from a maximum of 60 manatees (2006) to over 300 manatees (2014) during cold spells.
- In recent years, during warm intervals between Nov – March, many manatees still use the interior of the springs, regardless of the air temperature, and to some extent regardless of tidal activity.
- Between Nov – March, the 2 main areas of manatee resting activity inside the springs during cold and warm intervals occur around the 2 springs found on the eastern lobe (largest), and at the western lobe known locally as “secret sister”.
- During low tides, few manatees visit the interior of the springs for resting. However, over the past 2 years a significant number of manatees have been counted using the eastern and western lobes during low tides, particularly during cold spells.
- Since 2010, during cold spells, high numbers of resting manatees have extended their aggregation range to the area between Idiots Delight I and Idiots Delight II (mouth of spring run). *Note: Prior to 2011 manatees were not commonly seen resting at the mouth of the spring run.*

Recreation Distribution and other Recreation Statistics at Three Sisters Springs

- Visitation numbers at Three Sisters Springs reported by the commercial SUP holders between November – March have risen from 10,000 visitors in 2006 to over 63,000 in 2012-2013 and expected to exceed 80,000 visitors between November and March of 2014-2015.
- Annual (year-round total reported visitation) visitation has increased from approximately 15,000 visitors in 2006 to over 127,000 visitors reported in 2013.
- Public Use Survey data (started in 2009) at Three Sisters Springs indicates that over 250,000 annual visitors are visiting Three Sisters Springs year-round (combination of guided visitors and non-guided visitors).

Since the acquisition of TSS in 2009:

- Since 2009 there are 33 current Special Use Permit holders for Dive Shop operations (and guided snorkeling tours) and a total of 10 Special Use Permit holders for outfitter operations (kayak, paddleboarding and canoeing), totaling 43 current annual commercial SUP holders for commercial guiding activities in Refuge waters.
- From the 33 commercial guiding (snorkeling) SUP holders, a total of 30 currently operate commercial guided tours at least on a monthly basis on refuge waters, but 26 operate in a weekly basis, year-round.
- The number of visitors reported by Dive Shops and outfitters combined reached over 127,000 visitors in 2013 and are expected to surpass 140,000 in 2014, according to the numbers reported so far this year.
- It is known that over 50 out-of-town commercial operations are entering refuge waters without an SUP via a rental boat or personal boats. There is no true way to regulate who is who. Just google “manatee tours, crystal river” and dozens of websites from out-of-town outfitters/dive shops will pop up with scheduled dates for TSS included.
- An average of 40 additional permits are issued to commercial photographers and filmmakers each year.
- Over 1,500 amateur photographers (no SUP issued) visit Three Sisters Springs between Nov – March, since 2010 (Public Use Survey data). Most of them use large camera equipment with flash. Most are not aware of the rules before entering springs. Many LE citations have been issued to amateur photographers inside Three Sisters Springs since 2010.

Three Sisters Springs Public Use Survey Results (2010 – 2014)

Preliminary results from Public Use Surveys (by daily manatee watch volunteers) conducted from 2010 – 2014 indicate the following recreation highlights at Three Sisters Springs between Nov – March.

Note: The data obtained by Manatee Watch volunteers occurred during different hours each day and not throughout an entire day (sunrise to sunset), except on some holidays. This led to volunteers missing the collection of data during peak time hours in most weeks. So the figures below are conservative figures that do not necessarily define the daily recreation scenario of the winter months inside Three Sisters Springs.

Non-Motorized Vessels:

- An average of 190 non-motorized vessels per day (sunrise to sunset), enter TSS during weekdays (non-holidays).
- An average of 315 non-motorized vessels per day (sunrise to sunset), enter TSS during weekends and holidays.
- The most non-motorized vessels ever counted in a single day inside Three Sisters Springs (March 11, 2011 – Spring Break) exceeded 850 total vessels between sunrise and sunset.

Swimmers:

- An average of 475 swimmers per day enter TSS (sunrise to sunset) during weekdays (non-holidays).
- An average of 630 swimmers per day enter TSS (sunrise to sunset) during weekends and holidays.
- The most swimmers ever counted in a single day (Manatee Festival 2014) exceeded 950 swimmers between sunrise and sunset. *Note: On this same day over 700 vessels were estimated to have visited the springs, and over 150 boats were anchored outside of springs from sunrise – sunset.*

All vessels statistics:

- *Motorized vessels (private, tour and rentals) anchored outside of the springs average over 105 vessels per day during weekdays (non-holidays).*
- *Motorized vessels (private, tour and rentals) anchored outside of the springs average over 160 vessels per day during weekends and holidays.*
- *The daily average distribution ratio of non-motorized vessels to motorized vessels during the six month period is 4 : 2 The average ratio in holidays and weekends is 3 : 1, but there have been many days (particularly weekends and holidays) where the ratio has been 4 : 1*

More on Three Sisters Springs Hydrology and Manatees Using the Springs

- Three Sisters Springs is considered the most ideal and most suitable manatee wintering habitat during extreme cold fronts in Citrus County. But at the same time, Three Sisters Springs is the most delicate and ecologically sensitive of all the manatee wintering sites in Citrus County and the most vulnerable to human and natural threats.
- Since the severe record breaking cold snap of January 2010, over 300 manatees have been counted around the Three Sisters Springs watershed at one time in peak days for the past two winters. An average of 70 manatees per day, are found in Three Sisters Springs throughout the winter (November – March). During most winter days there is significant manatee activity inside the springs.
- Eight years ago and beyond, manatee numbers in Three Sisters Springs never exceeded 60 individuals at the highest count.
- Three Sisters is also the most difficult spring in the County to survey (aerial survey) for manatees during high tides. Vegetation cover makes it impossible to count all manatees inside the springs. Low tides provide for accurate counts when manatees are found resting outside the spring in an open area. However, there are many unofficial counts done by USFWS staff and volunteers counted from the boardwalk.
- The spring group is made up of three main spring areas, but approximately 20 spring vents make up the entire spring group. The flow rate of water from these vents was estimated in March of 1995 to range between 15-20 million gallons of water per day.

- It is the nature of its shallow area surrounding the springs at a constant 72 degrees F, that makes Three Sisters Springs such an ideal wintering site for manatees, compared to Gator Hole, King Spring, and Blue Waters Springs. In addition, the sanctuary outside Three Sisters Springs is kept constantly warm by the strong current along the adjacent spring run. The springs location near the dead end of the channel, allow for resting manatees to find safe haven from boat traffic.
- The shallow water column in the springs provide for great manatee viewing and photography opportunities, but at the same time it allows for people to stand, walk and kick on the water bottoms, which stirs the silt, impairs visibility, and leads to increasing water depth over time. As shallow areas are reduced, manatees are left with deeper water to rest where it is more difficult to ascend for air and to benefit from sun radiation while submerged during extreme weather
- The open area of the Three Sisters Springs basins and connecting surface water area is approximately one and half acre and approximately 8-12 feet deep at the vents. But the water column areas around the vents vary between 3 – 7 feet deep, where manatees are typically found resting.
- The Three Sisters Spring group discharge account for approximately 3% of the total Crystal River Spring group.
- Prior to the seventies, tapegrass (*Vallisneria* spp.) was the most abundant aquatic plant present and distributed throughout the spring and spring run. The abundant aquatic vegetation held the fine sediments in place and limited sediment erosion. The 1994 ecological assessment documented only three small patches of tapegrass remaining. The exotic Hydrilla was also abundant in the springs until sprayed by the Goodman's caretaker.
- Most of the severely injured manatees in Citrus County find haven inside Three Sisters Springs. During cold days, manatees recognize Three Sisters Springs as a safe haven to recover from injuries. In the past five years, nearly 50% of manatee rescues in Kings Bay have taken place at TSS.

Other Recreation Facts:

- Water recreation at Three Sisters Springs alone, such as snorkeling with manatees, wildlife observation and photography, underwater photography, kayaking, canoeing, paddle boarding, swimming and summer scuba diving brings over 250,000 visitors each year from which 125,000 joined permitted tour operations in 2013.
- Scuba diving is only allowed in the summer months. Scuba diving in the winter could lead to manatee harassment for two reasons: a) manatees are likely to be approached from the bottom (straight line motion along the bottom) leading to disturbance of resting manatees, and b) some manatees are susceptible to the sound of scuba gear.
- Fishing inside the springs isn't allowed year round for safety reasons for both, visitors and manatees.
- The local economy benefits from the following visitor types that visit TSS each year: *guided scuba tours (summer), guided snorkeling tours, guided kayak/canoe/paddleboard tours, guided photography tours, commercial photography, research, guided boat tour (dry tours) and local and out of town non-guided visitors.*
- Most foreign winter visitors to TSS springs come from Germany, Switzerland, Japan, France, England, several eastern Europe countries and Canada.
- The biggest challenge at Three Sisters Springs that the USFWS and the City of Crystal River face is how to balance the recreational uses of the springs with the manatee population dynamics occurring between Nov – March each year.
- Winter and summer recreational uses must be carefully managed at Three Sisters Springs to maintain the balance of its delicate ecosystem components which have already suffered much deterioration from erosion.
- Current Public Use Surveys and visitor reports from dive shops provide for an essential management tool for future management of the water recreation inside the springs.
- Manatees in the springs could be disturbed by both: swimmers (including snorkelers and scuba divers) and kayakers/canoers/paddleboarders. There are responsible guidelines for both types of users but they haven't proved to be enough to ensure manatees aren't harassed.
- The USFWS has developed specific rules at TSS to: a) ensure compliance with mandates from the Endangered Species Act, b) to prevent further erosion in the springs, c) to preserve the natural integrity of the ecosystem, and d) to promote safety for all visitors inside and outside the springs.

- Summer recreation has already led to some detrimental impacts along the springs' banks, vegetation around the springs and infrastructure of facilities around the springs. Winter recreation mostly consists of manatee observation oriented activities, such as swimming with manatees and manatee observation from kayak/canoe, however, regardless of human behavior, manatees are being impacted by the uncontrolled numbers of people at one time.
- During the winter months, self-policing on behalf of captains, guides, manatee watch volunteers, SCA interns and local residents has helped prevent some violations such as manatee harassment, trespassing, vegetation deterioration and vandalism.
- Two webcams placed between Nov – March provide remote monitoring of the site by LE officers, volunteers and other viewers, while providing for manatee observation to millions of internet users from across the world. The cameras also help prevent infractions just by the fact that people know they are being watched at all times.
- Swimmer activities (such as flushing the water bottom with use of fins) can disturb the bottom sediments of the shallow spring and spring run, mobilizing the sediment into the water column, while impairing visibility for swimmers and manatees.