

Documented Increase in Manatee Use at the Wakulla River, FL

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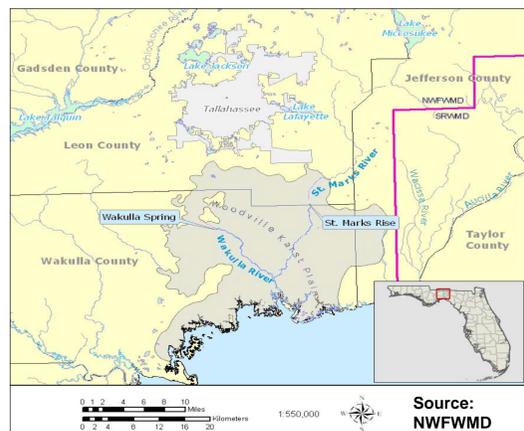
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ABSTRACT

Wakulla Spring, a first magnitude spring (644 cfs mean discharge 2006-2010 ; median temp 19.8 C), is the largest natural warm water site northwest of the Suwannee River that could provide winter refuge for large numbers of Florida manatees (*Trichechus manatus latirostris*). This spring forms the headwaters of the Wakulla River, which flows 9 miles before merging with the St. Marks River. A wide diversity of vegetation exists in the region with predominantly *Vallisneria sp.* and *Najas sp.* in the Wakulla, and abundant seagrass beds in the estuarine portions of the lower St. Marks River, including *Ruppia maritima*, *Halodule wrightii*, *Syringodium filiforme*, and *Thalassia testudinum*. Since 1997, daily counts of manatees have been recorded by staff at Wakulla Springs State Park, showing maximum counts by month increasing in fall and peaking during the winter season. We have documented an increase in manatee winter use of Wakulla Spring and River since 2007. Manatee counts during winter (Dec-Feb) have increased, with maximum counts of 12, 15, 32, and 36 for 2007/2008 through 2010/2011. Some scarred manatees photographed in the Wakulla were matched to the statewide Manatee Individual Photo-Identification System, revealing that many of these known individuals have historically used the Crystal and Homosassa rivers during winter. Several of these now show winter site fidelity to Wakulla Spring. Photo-identification is also being used to document warm season fidelity to the Wakulla/St. Marks system; several of these manatees are known to overwinter in Crystal and Homosassa rivers. Abundant warm water and aquatic vegetation could support a large number of manatees at this winter refuge. With an expanding subpopulation in the Big Bend region, the Wakulla/St. Marks region holds promise for sustaining manatees outside the current primary winter refuges at the Crystal and Homosassa rivers.

INTRODUCTION and METHODS

Little is known about areas of use and habits for manatees west of the Suwannee River, FL. Several warm water refuges occur in this region and are available for manatee use during winter. Correlated with a documented increase in the Crystal River subpopulation, winter use at other natural springs in northwestern Florida is increasing. In spring 2008, USGS initiated a study to assess manatee habitat and use patterns in the northern Gulf of Mexico with a focus on Wakulla Springs State Park, and the Wakulla and St. Marks Rivers. The Park and rivers are located approximately 14 miles south of Tallahassee, FL. Wakulla Spring is the largest natural spring west of the Suwannee River and one of the largest and deepest freshwater springs in the world. It forms the headwaters for the Wakulla River, which flows south before merging with the St. Marks River. The goal of this study is to gain knowledge regarding manatee use of this region by assessing habitat, documenting winter use of Wakulla Springs State Park, and using photo-ID techniques for determining individual manatee use patterns.



Location of Wakulla Spring, Wakulla River and St. Marks River in northwest Florida

Habitat

Wakulla Springs has a median temperature of 19.8 degrees C, and the thermal plume extends approximately 6 miles downriver from the headspring to SR 98, making the spring/river attractive as a natural winter warm water site for manatees. The water of the Wakulla River, originating at Wakulla Springs, remains clear throughout its length. Site visits were conducted to assess the habitat for manatee use by documenting temperature and salinity throughout the river and documenting abundance and composition of forage available to manatees within the Wakulla/St. Marks rivers complex.

Manatee Counts

Since 1997, staff at Wakulla Springs State Park (WSSP) have recorded daily counts of manatees within the Park. The area where the counts are recorded includes the headspring and approximately one mile of the spring run.

Photo-Identification

Using standard protocol methods for photo-identification, photographs of scarred manatees were opportunistically taken from land, boat or in water, throughout the study area during all seasons from 2008-2011. Individuals were then matched to catalogued manatees in the statewide Manatee Individual Photo-Identification System (MIPS).

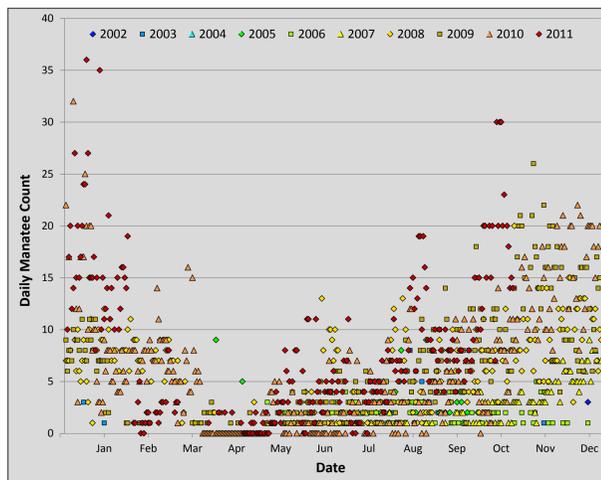


RESULTS and DISCUSSION

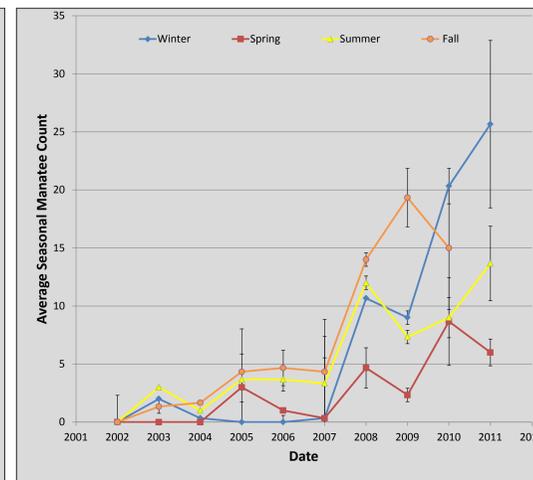
The Wakulla River has an abundance of submergent and emergent fresh water vegetation. The predominant submerged species are *Vallisneria sp.* and *Najas sp.*. *Hydrilla sp.*, and *Cabomba sp.* can also be found. Predominant emergent vegetation includes *Pontederia sp.* and *Sagittaria sp.* Seagrass beds are found at the mouth of the St. Marks River and in Apalachee Bay and are predominantly *Ruppia maritima*, *Halodule wrightii*, *Syringodium filiforme*, and *Thalassia testudinum*.



Daily manatee counts within WSSP show increasing numbers of manatees using the Park, with peak counts in fall and winter. Winter counts have steadily increased from 2007/2008 to present. As spring approaches and water temperatures increase, manatees move out of the Park and begin using the entire length of the Wakulla River, the St. Marks River, and the seagrass beds at the mouth of the St. Marks River and Apalachee Bay. As fall approaches, manatee visitation to the Park again increases.



There is a noticeable increase in use in the Park during the winter season as more manatees seek warm water refuge, and decrease in the spring as temperatures rise and manatees move out of the Park.



Average seasonal manatee counts within WSSP show increased manatee use since 2007 for all seasons (Winter = Dec-Feb, Spring = Mar-May, Summer = Jun-Aug, Fall = Sep-Nov).

During the study period (2008-2011) 41 manatees using the Wakulla/St. Marks complex were matched to catalogued manatees in the MIPS. Of these, 37 had sighting histories in the Crystal River, FL area, 3 had sighting histories in the Tampa Bay, FL area, and 1 had sightings only in the Wakulla River. There were 10 manatees documented in the study area that were matched to distinct unknowns. All of these had sighting histories in the Crystal River area. In addition, there are several manatees documented in the study area that could not be matched to previously sighted individuals.

Animal ID	2008				2009				2010				2011				Total
	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	
CR577																	10
CR505		X	X														8
CR054																	8
CR260																	8
CR520																	7
CR145																	7
CR442																	7
CR579																	6
CR585																	6
CR575																	6
CR434																	6
CR511															X	X	5
CR576																	4
CR165																	4
CR272																	4
CR531																	4
CR521																	4
CR023																	4
CR431																	4
CR267																	3
CR359																	3
CR572																	3
CR419		X	X	X	X	X											3
CR500											X	X	X	X	X	X	3
CR018								X	X	X	X	X	X	X	X	X	3
CR078																	3
CR533																	2
CR284																	2
TB320																	2
CR075																	2
CR119																	1
CR091																	1
CR167																	1
CR289										X	X		X	X	X		1
CR344																	1
CR346																	1
CR562																	1
TB186																	1
TB294																	1
CR568																	1
CR566			X	X	X	X	X	X	X	X	X	X	X				0
Total	3	7	11	11	7	5	8	12	10	3	10	16	13	4	15	16	

Yearly seasonal visitation of individual catalogued manatees to the Wakulla/St. Marks system shows increased use in both fall and winter. Spring and summer seasons are more variable likely due to increased travel by manatees during these seasons. Totals in the far right column are the number of seasons from 2008-2011 that individuals were photo-documented in the region. Totals on the bottom row are the numbers of known individuals photo-documented within that season. The X's in the table refer to manatees that were radio-tracked during these periods and were not marked on the chart to avoid bias.

CONCLUSIONS

Wakulla Springs and the Wakulla/St. Marks River system, with its abundant warm water for winter refuge and vegetation available for forage, holds great potential for supporting large numbers of manatees. We have documented increased use by manatees at this site and it is likely that use will continue to increase in the coming years. With the increase in manatee counts in the Big Bend region, this site holds promise for sustaining manatees outside of the currently used primary winter refuges at Crystal and Homosassa rivers.

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