

Sharks Tooth Spring Sampled 2013-2014

Site Information

Sharks Tooth Spring, located along the North Sulphur Island Loop trail in Seminole State Forest (SSF) is one of better known springs of this study. It was originally mapped in 1997 by USGS. The discharge was measured by SJRWMD in 2005 and again in 2008. The mean discharge was 0.18 cubic feet per second (cfs), putting it in category as a fifth magnitude. The spring emerges at the base of Sulphur Island from one vent. The riparian zone consists of a normal, expected community of native plants, trees, and shrubs including sabal palmetto, red bays, sweet gum trees, oaks, and little human disturbance. The spring run flows through heavily shaded woods, with sandy bottom until it enters Sulphur Run.

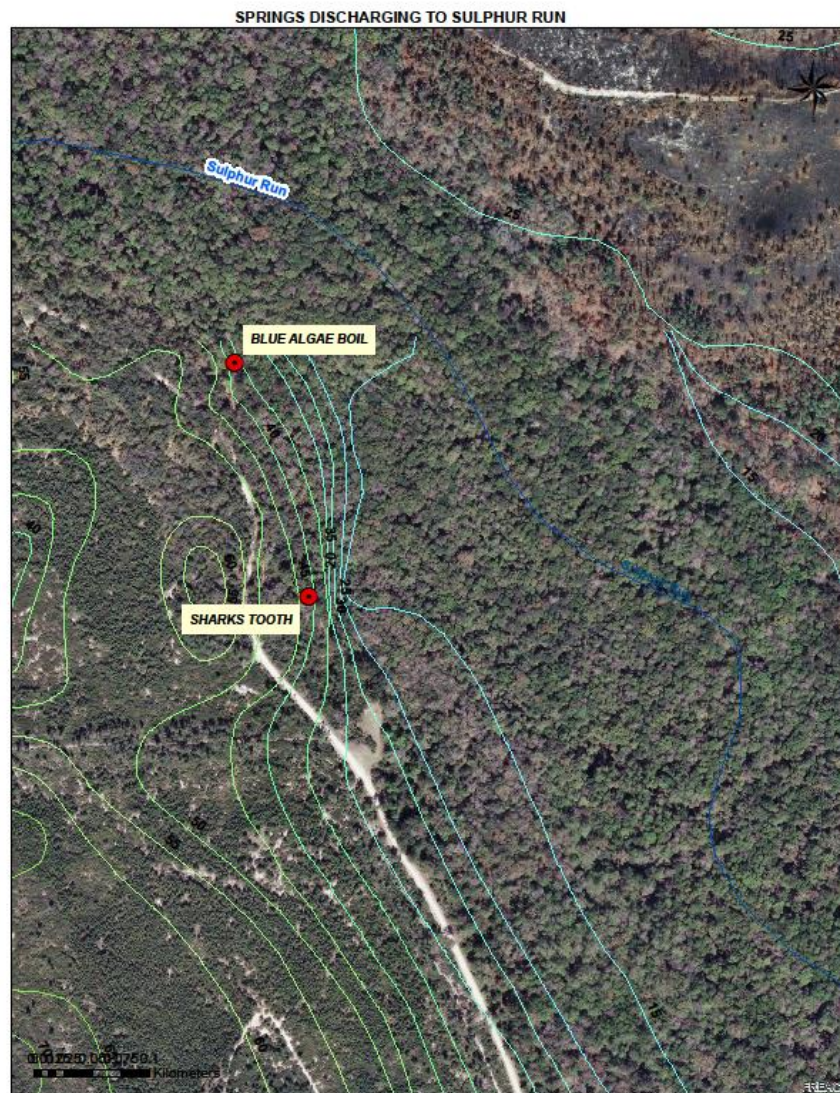


Figure 1-ST. Location of Sharks Tooth Spring in State Forest in Lake County

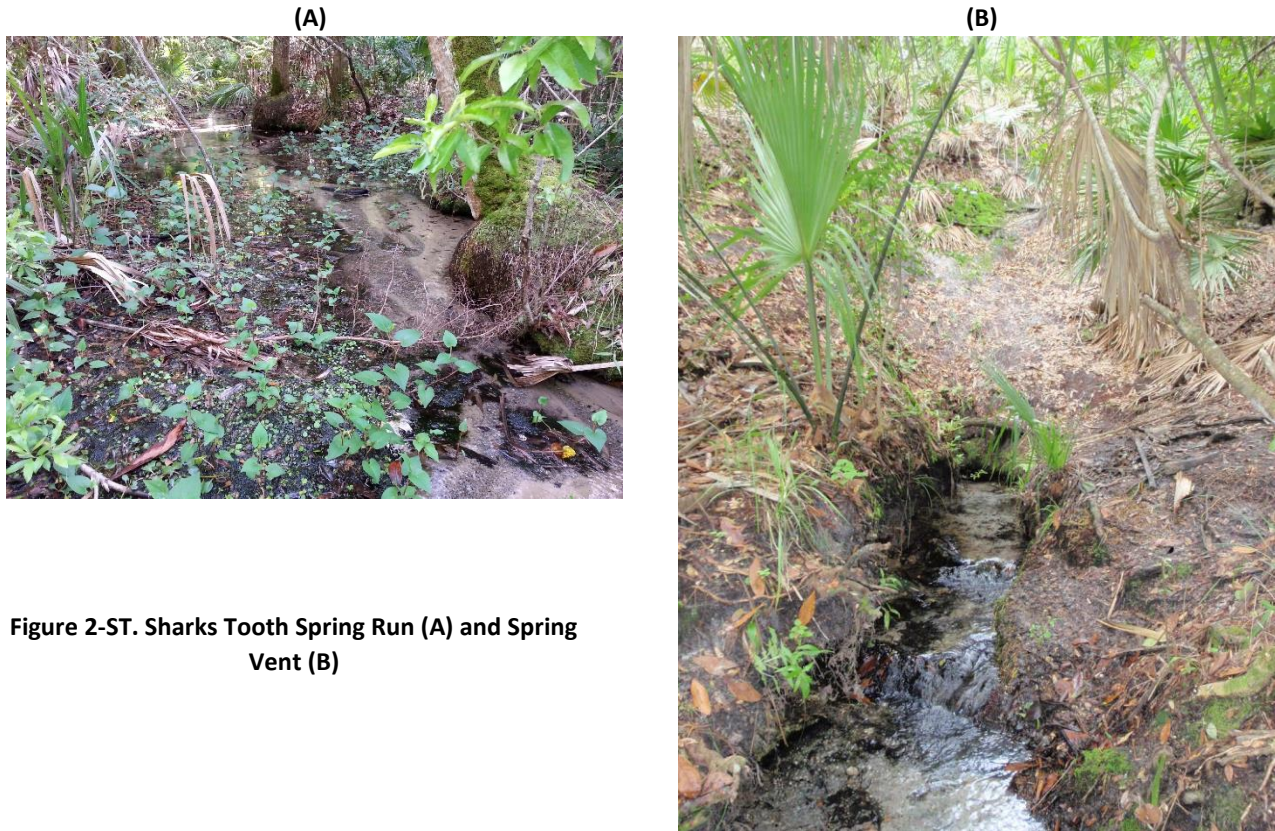


Figure 2-ST. Sharks Tooth Spring Run (A) and Spring Vent (B)

Results

Water Quality

Water quality was fairly constant throughout all four sampling events. The dissolved oxygen (DO) results were low, but that is a natural condition for ground water. Sucralose was not detected and boron results were low but a little higher than in several other SSF springs. Nitrate/nitrite (NO_3+NO_2) was detected in all samples at fairly low concentrations, suggesting that human activities have slight impact on water source of the spring. All other nutrients were also low. There is not sufficient data to calculate annual geometric means for nitrate/nitrite for Sharks Tooth Spring, however, all four sample results indicate that NO_3+NO_2 limit is well within the springs water criteria rule 62-302.531(2)(b)2 which states: "For spring vents, the applicable numeric interpretation of the narrative nutrient criterion ...is 0.35 mg/L of nitrate-nitrite as an annual geometric mean, not to be exceeded more than once in any three calendar year period." Conductivity readings vary slightly between 772 and 786 $\mu\text{mhos/cm}$.

Comparison of these results to data collected by SJRWMD and Lake County in 2004 and 2005 revealed that conductivity, TDS, alkalinity, calcium, magnesium, sodium, potassium were all a little higher in 2013-2014. The TP and ortho-p concentrations remained approximately the same, while nitrate/nitrite concentrations were a little lower during recent sampling.

Table 1-ST. Water Quality Results for Sharks Tooth Spring

Date Sampled	7/18/2013	10/9/2013	1/21/2014	4/16/2014
pH	7.49	7.47	7.57	7.6
DO mg/L	0.95	0.75	0.94	0.73
DO %	11.2	8.6	10.6	8.5
Specific Conductance (µmhos/cm)	774	783	786	772
Water temperature (°C)	22.3	22.36	22.44	22.37
Fecal Coliform (cfu/100mL)	2 U	2 U	2 U	2 U
Enterococci (cfu/100mL)	n/a	2 U	n/a	n/a
Turbidity (NTU)	0.25	0.3	0.15	0.35
Alkalinity (mg CaCO ₃ /L)	124	121	124	115
Chloride (mg Cl/L)	110	100	100	110
Color true (PCU)	2.5 U	2.5 U	2.9 I	2.5 U
Fluoride (mg/L)	0.16	0.16	0.16	0.18
Sulfate (mg SO ₄ /L)	100	100	110	100
TDS (mg/L)	421	414 A	418	430 A
TSS (mg/L)	2 U	3 I	2 U	2 U
Ammonia (mg N/L)	0.007	0.008	0.017	0.008
Nitrite/Nitrate (mg N/L)	0.047	0.046	0.11	0.041
Total Phosphorous (mg P/L)	0.053	0.054	0.056	0.055
Total Kjeldahl Nitrogen (mg N/L)	0.097	0.080 U	0.11	0.08 U
Organic Carbon (mg C/L)	0.5 U	0.61 I	0.78 I	0.9 I
Ortho-phosphate (mg P/L)	0.051	0.051	0.053	0.053
Sucralose (µg/L)	0.010 U	n/a	n/a	n/a
Calcium (mg/L)	67.6	68.2	67.4	67.9
Magnesium (mg/L)	19.3	19.7	18.5	19.4
Potassium (mg/L)	2.2	2	2.1	2
Sodium (mg/L)	59.6	57.7	n/a	n/a
Boron (µg/L)	37.6	34.5	21.7	31.1

A- Value reported is the mean of two or more determinations

I- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U - Indicates that the compound was analyzed for but not detected.

n/a -not collected or not reported due to data quality concerns

Habitat Assessment

The HA score was 133 on January 21, 2014. Most secondary parameters reflected the optimal conditions except bank stability that was showing some erosion along the spring run. Also, a hiking trail crossing over the run contributed to human disturbance. Three macroinvertebrate habitats were present: snags, leaf packs, and aquatic vegetation. The spring run was shallow but well defined with consistent flow with mostly sandy bottom and some accumulation of detritus.

Aquatic Macroinvertebrate Community

A total of 20 macroinvertebrate taxa were identified (Table 2-ST) in a subsample of 296 individuals collected on January 21, 2014. The dominant taxon was the snail, *Floridobia sp.* (184 individuals, 62.2% of the subsample). Twenty five percent of the subsample was represented by the amphipods: *Gammarus sp.* and *Hyaella azteca*. A sensitive mayfly, Heptageniidae was identified in addition to two other sensitive taxa: *Hemerodromia sp.* and *Lype*

diversa. Based on information provided by Dana Denson, Macroinvertebrate Coordinator with Reedy Creek Improvement District and Andrew K. Rasmussen, Ph.D. with Florida A&M University, this represents the southernmost record of the caddisfly *Lype diversa*. Prior to this record, the southernmost extent of its range in Florida was Mormon Branch and a nearby unnamed stream in Marion County. During this study, *Lype diversa* was also found in Boulder spring run.

This taxa list dominated by amphipods and snails is to be expected for a 5th magnitude spring, although presence of caddisflies, mayflies, odonates, beetles, and true flies is evidence of good macroinvertebrate habitats and good water quality in the spring run.

Table 2-ST. Macroinvertebrate Data for Sharks Tooth Spring Run

Phylum	Class	Order	Family	Genus and Species	# of taxa
Arthropoda	Insecta	Coleptera	Elmidae	Microcylloepus pusillus	2
		Diptera	Chironomidae	Stenochironomus sp.	6
				Polypedilum fallax	1
			Tabanidae	Chlorotabanus sp.	1
				Rheotanytarsus exiguus grp.	1
			Dixidae		1
			Empididae	Hemerodromia sp.	1
		Ephemeroptera	Heptageniidae		1
		Heteroptera	Belostomatidae	Belostoma sp.	1
		Odonata	Coenagrionidae	Argia sp.	11
		Trichoptera	Psychomyiidae	Lype diversa	5
	Crustacea	Amphipoda	Hyalellidae	Hyalella azteca	49
			Gammaridae	Gammarus sp.	26
		Decapoda	Cambaridae		1
Mollusca	Bivalvia	Veneroida	Carbiculidae	Corbicula fluminea	1
	Gastropoda	Mesogastropoda	Hydrobiidae	Floridobia sp.	184
			Pleuroceridae	Pleurocera sp.	3
Platyhelminthes					1

Periphyton Survey

There was no periphyton around the boil or along the spring run.

Linear Vegetation Survey

Several native plants were identified growing within the spring run: *Hydrocotyle*, *Ludwigia repens*, *Saururus cernuus*, *Rhynchospora inundata*, and *Cicuta mexicana*. A lot of surfaces (rocks, snags) were also covered by moss.

Summary

Sharks Tooth Spring is a fifth magnitude spring located within Seminole State Forest. It is surrounded by natural area with some human disturbance. The spring's discharge and water quality are consistent throughout a year. Water quality meets surface water criteria specified in Chapter 62.302, F.A.C. The plant and macroinvertebrate community are normal for small springs and spring run systems.