Droty Spring
Sampled 2013-2014

Site Information

Droty Spring emerges south of Seminole Creek in an outparcel of Seminole State Forest. The spring's flow was measured in 2005 and in 2008 by the St. Johns Water Management District, and the mean discharge was 0.65 cubic feet per second (cfs) putting it in the category of a fourth magnitude spring. Water discharges from sand boils at the bottom of a ravine, creating a sandy spring run averaging 4 feet wide, and flowing approximately 500 feet northeast into Seminole Creek. The riparian zone consist of a normal, expected community of native plants, trees, and shrubs, though a large stand of banana trees near the spring shows some evidence of human disturbance, along with concrete blocks in the spring run.

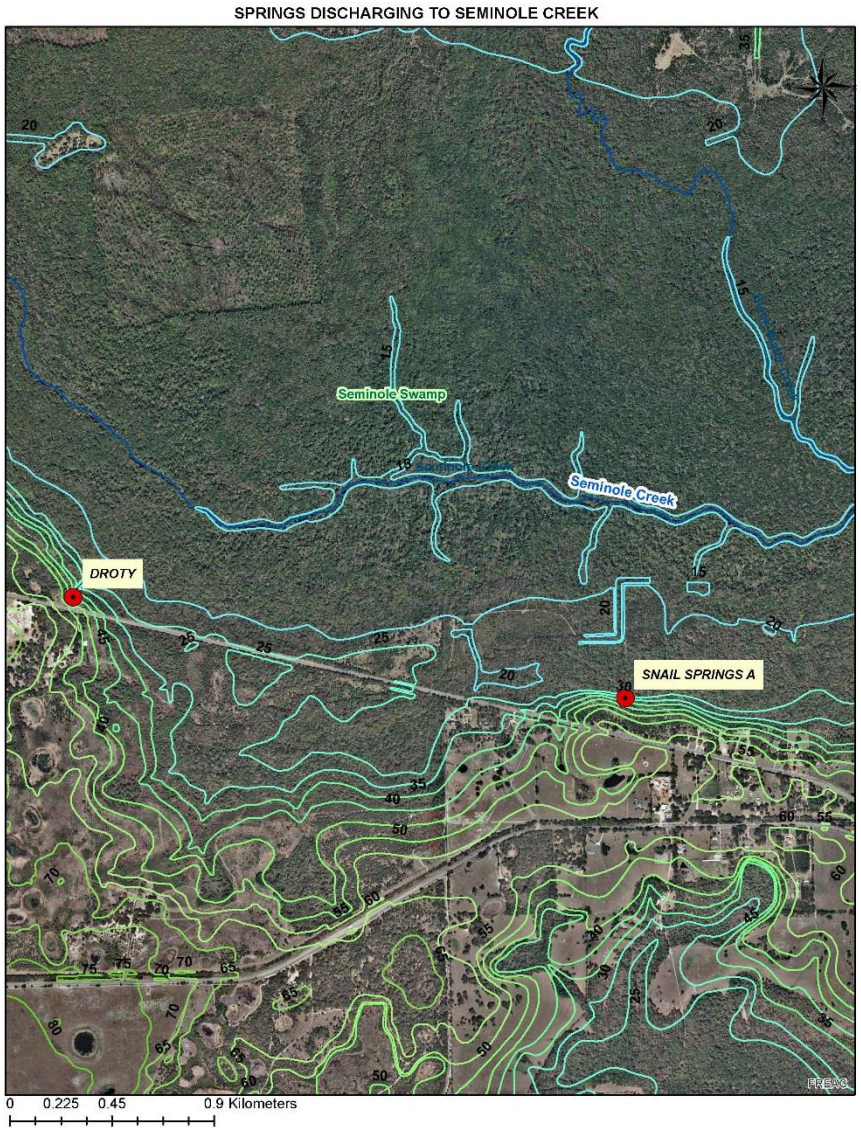

Figure 1-Dr. Location of Droty Spring in State Forest in Lake County

(A) (B)

Figure 2-Dr. Droty Spring Run (A) and Spring Vent (B)

Results

Water Quality

Water quality varied slightly between quarterly results. (Table 1-Dr). Nitrate/nitrite (NO_{3+2}) results were not detectable during the first sampling in July 2013 and last sampling in April 2014 and barely detected during October 2013 sampling. There are only three NO_{3+2} results. Due to sample contamination, the January 13 sample result was not valid. Boron results were low. The data suggest that human activities have not impacted water source of the spring. There is not sufficient data to calculate annual geometric means for nitrate/nitrite for Droty, however, all three sample results indicate that NO_{3+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." All other nutrients were also low. Water quality results are comparable to the data collected by Lake County in 2004.

Table 1-Dr. Water Quality Results for Droty Spring

Date Sampled	7/15/2013	10/7/2013	1/13/2014	4/14/2014
pH	7.43	8.14	7.5	7.7
DO mg/L	0.26	0.6	0.45	0.24
DO %	2.7	8.3	5.1	2.8
Specific Conductance (µmhos/cm)	313	319	312	315
Water temperature (°C)	23.6	23.6	23.68	23.6
Fecal Coliform (cfu/100mL)	2 U	2 B	2 U	2 U
Enterococci (cfu/100mL)	86	6 B	n/a	n/a
Turbidity (NTU)	0.2	0.10 U	0.15	0.15
Alkalinity (mg CaCO3/L)	115 A	112	120	115
Chloride (mg Cl/L)	7.2	7.1 A	7.2	7.3
Color true (PCU)	3.1 I	3.4 I	4.3 I	3.2 I
Fluoride (mg/L)	0.17	0.19	0.18	0.19
Sulfate (mg SO4/L)	28	30 A	28	32

TDS (mg/L)	193	190	172	187
TSS (mg/L)	2 I	2 U	2 I	2 I
Ammonia (mg N/L)	0.14	0.15	0.17	0.14
Nitrite/Nitrate (mg N/L)	0.004 U	0.005 I	n/a	0.004 U
Total Phosphorous (mg P/L)	0.093	0.092	0.091	0.091
Total Kjeldahl Nitrogen (mg N/L)	0.21	0.19 I	0.21	0.19 I
Organic Carbon (mg C/L)	1.2	1.3	1.3	1.2
Ortho-phosphate (mg P/L)	0.086	0.086	0.089	0.09
Sucralose (µg/L)	0.010 U	n/a	n/a	n/a
Calcium (mg/L)	41.8	41.1	41.2	41
Magnesium (mg/L)	11.5	11.8	11.4	11.5
Potassium (mg/L)	0.94 I	1.0 I	0.86 I	0.95 I
Sodium (mg/L)	4.8	4.7	n/a	n/a
Boron (µg/L)	16	15.3	18.4	15.9

B- Results based on colony counts outside the acceptable range

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 full spring run could not be assessed due to limited accessibility, therefore only approximately 40 m was assessed during October 2013 sampling. Secondary parameters reflected optimal conditions, with some points deducted for bank stability due to the spring being located in a ravine. Three macroinvertebrate habitats were identified: snags, leaf mats, and rocks. However many substrates were smothered with algae and/or sulfur bacteria. The spring run was shallow with a sandy bottom. Plants noted around the spring run include *Vitis sp.*, *Smilax sp.*, *Andropogon sp.*, *Woodwardia virginica, Osmunda cinnamomea, Myrica cerifera*, *Magnolia virginiana*, *Persea palustris* and non-native banana plant.

Aquatic Macroinvertebrate Community

Macroinvertebrates were not collected at Droty Spring.

Periphyton Survey

Periphyton was present in the run as well as at the vent, and was sampled October 7, 2013 and submitted for taxonomic identification to the DEP Biology Laboratory. The dominant taxon was *Spirogyra* sp., which belongs to Class Cyanophyceae. *Spirogyra* is a large genus (listed about 386 species in the genus) which is very common and occasionally abundant in standing or flowing waters. *Oedogonium* sp. was also present. No diatoms were observed in the sample.

Linear Vegetation Survey

A linear vegetation survey was not performed due to limited accessibility and less than 2 square meters of vegetation being present within the spring run. Plants noted in the spring run include *Cladium jamaicense*, *Lemna minor*, native *Ludwigia*, and non-native *Landoltia punctata*.

Summary

Droty Spring is a fourth magnitude spring located in an outparcel of Seminole State Forest. It is surrounded by mostly natural area, but close to a highway and with a small amount of pasture land and residential areas nearby.

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.