

HOLMES CREEK SPRINGS INVENTORY WASHINGTON COUNTY, FL

Water Resources Special Report 2008-01



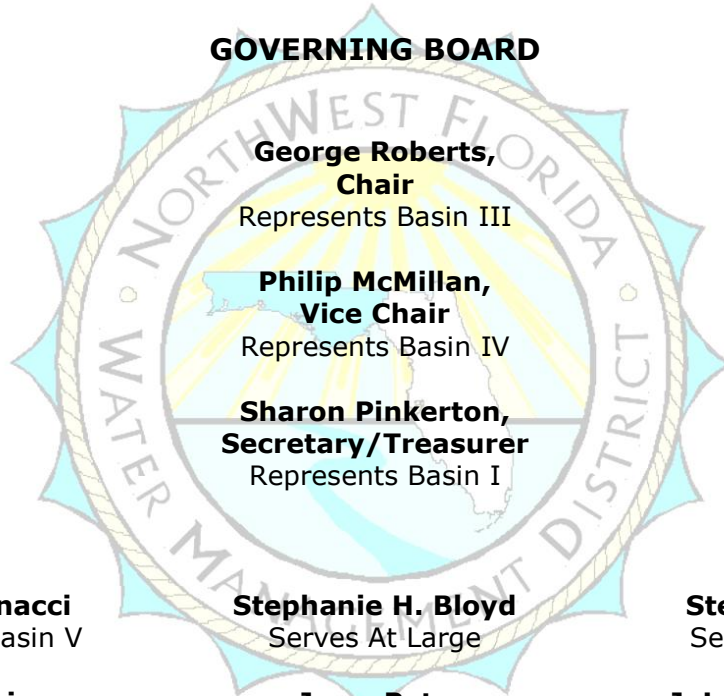
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Northwest Florida Water Management District
December 2008**

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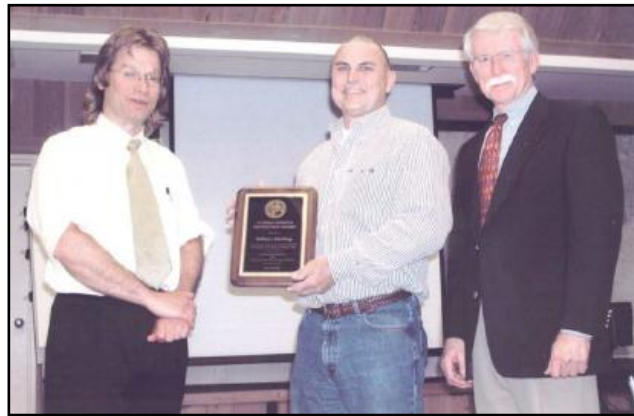
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Presentation of Florida Springs Protection Award, from left: Tom Pratt (NFWFMD), William Shirling, Jim Stevenson (FDEP).

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HOLMES CREEK SPRINGS INVENTORY

Introduction

The 2001 Florida Legislature funded the first phase of the Florida Springs Initiative to study and preserve the quality of Florida's springs. Administration of funds was assigned to the Florida Department of Environmental Protection (FDEP). FDEP contracted with the Northwest Florida Water Management District to monitor first-magnitude springs within the District, delineate springsheds and perform other research pertinent to springs during the first year of the program. When the 2002 Florida Legislature continued funding for a second year, FDEP requested proposals for additional work. Spring inventories are a vital component of efforts to protect springs. District staff proposed and the FDEP agreed to fund an inventory along Holmes Creek in Washington County.

In 1987 the District made a series of discharge measurements along Holmes Creek that indicated a significant ground water discharge to the creek. Local contacts indicated to the District that there were a large number of springs in the floodplain and surface water drainage basins not reported in the Florida Bureau of Geology Bulletin 31 "Springs of Florida" (revised, 1977). Hence, the District proposed conducting an inventory of springs in the middle Holmes Creek Basin in Washington County, Florida. This type of project is integral to understanding and protecting springs. The project was performed under FDEP Contract WM232. Specifically, the scope of work included visiting each site to collect photos and differential Global Positioning System (GPS) location information as well as performing discharge measurements for springs that appear to be second magnitude. Task deliverables consist of this report.

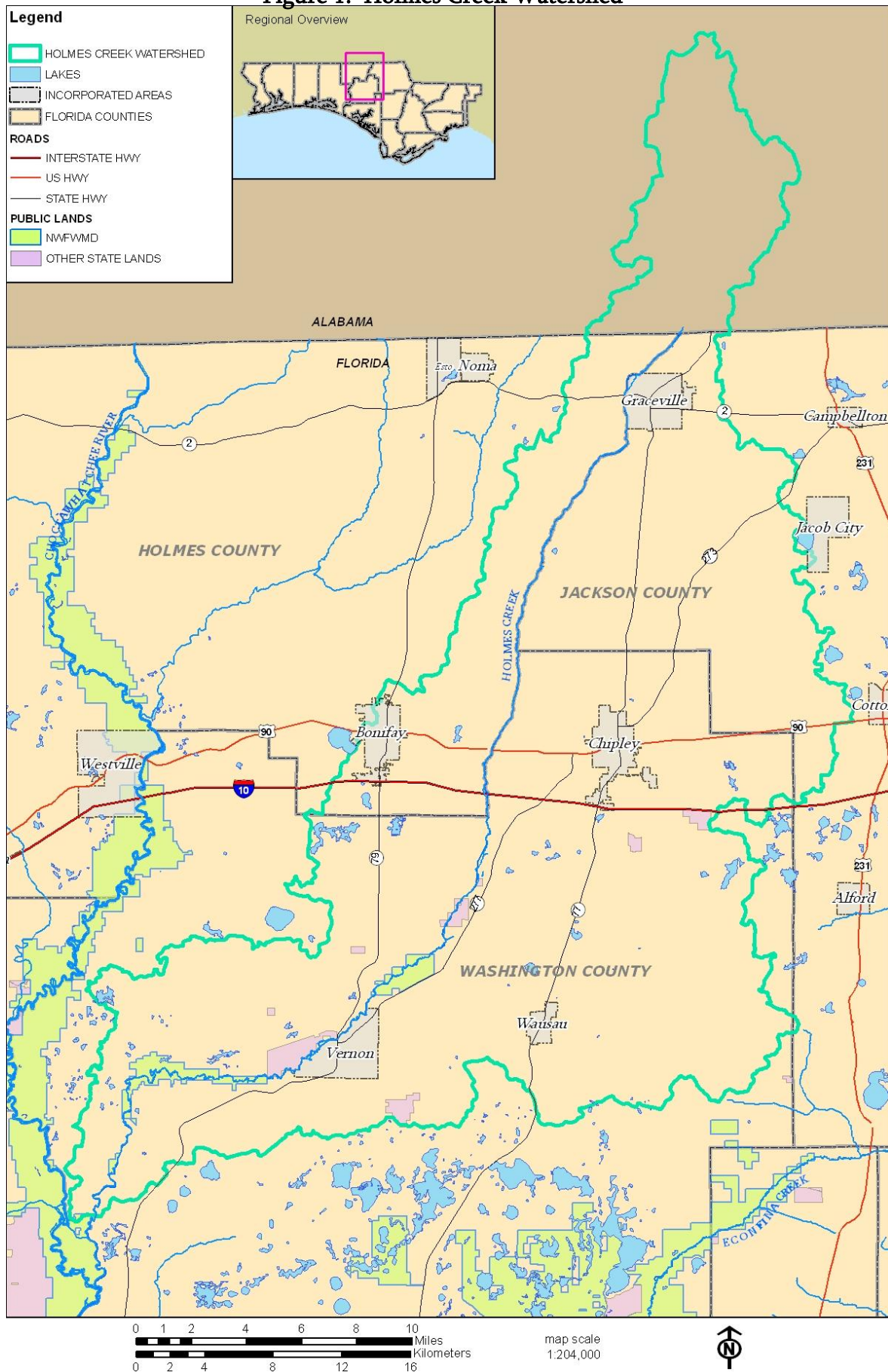
Area of Investigation

Holmes Creek originates approximately five miles north of the Florida-Alabama state line near Fadette in Geneva County, Alabama. It forms the county boundary between Jackson and Holmes counties in Florida, as well as a portion of the boundary between Holmes and Washington counties. Its surface-water drainage basin covers approximately 456 square miles (292,000 acres) in these four counties ([Figure 1](#)). Holmes Creek remains a relatively small stream until it reaches Washington County, where it gains the majority of its discharge via ground water inputs before joining the Choctawhatchee River. The study area for this spring inventory was the middle portion of the creek in Washington County, where the largest increase in discharge occurs.

Hydrologic Setting

Holmes Creek flows through the Dougherty Karst Plain which encompasses the northern portions of Bay and Calhoun counties, all of Jackson County and most of Washington and Holmes counties (Pratt et al., 1996)([Figure 2](#)). Karst topography results from the slow dissolution of carbonate bedrock by

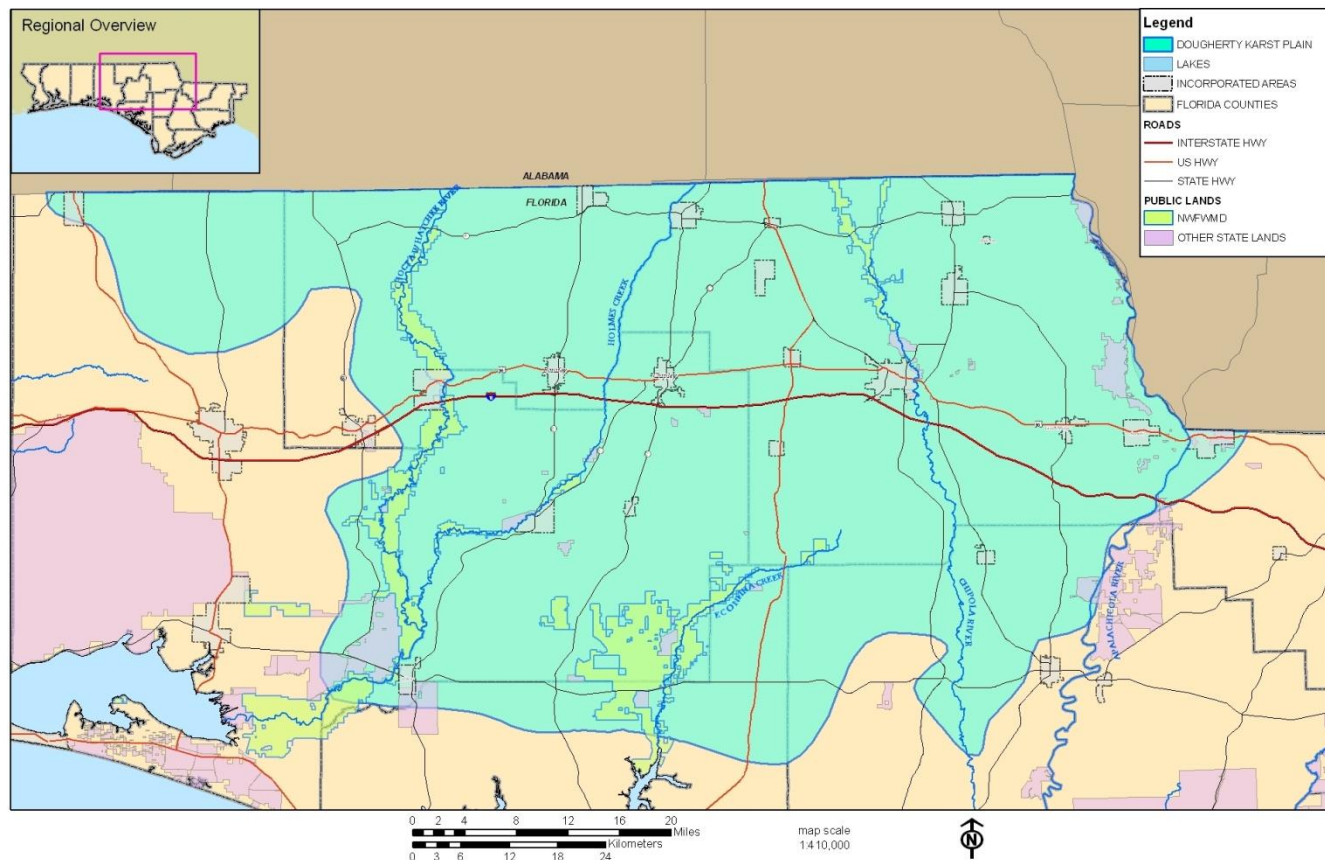
Figure 1. Holmes Creek Watershed



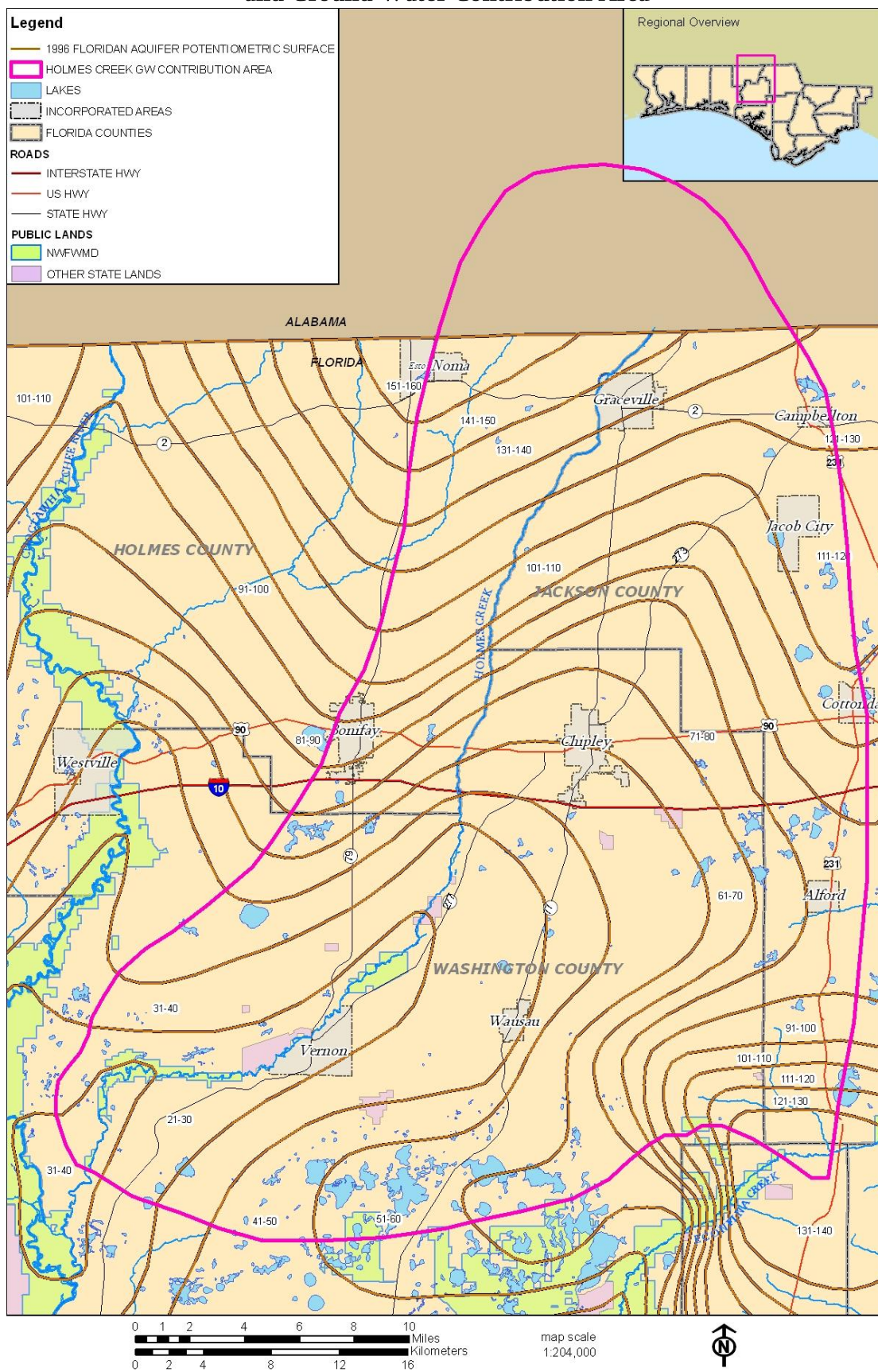
rainfall, streams, and ground water flow. Over time the carbonate bedrock will become riddled with caves, fissures, and other voids that once saturated with water can become a very productive aquifer. The majority of drinking water in Northwest Florida comes from carbonate bedrock that varies in age and composition, but is collectively known as the Floridan Aquifer. The Floridan Aquifer gains water through the leaky confinement of the Intermediate System and discharges to springs and rivers throughout the Dougherty Karst Plain. The semi-confined condition of the Floridan Aquifer across the Dougherty Karst Plain allows for large amounts of local recharge, but also makes the Floridan Aquifer especially vulnerable to contamination from activities occurring on the land surface. The Apalachicola River, Choctawhatchee River, Chipola River, Holmes Creek and Econfina Creek all gain water from the portion of the Floridan Aquifer that is recharged through the Dougherty Karst Plain.

In Washington County, the Floridan Aquifer is comprised of the Chattahoochee Formation, the undifferentiated Marianna/Bridgeboro Limestone and the Ocala Limestone (Green et al., 2003, draft). It has a thin to absent confining unit composed of unconsolidated clastic sediments of the Alum Bluff Group. This confining unit is frequently breached by sinks and paleosinks. Contained within the intermediate system may be a thin, minimally water-bearing surficial aquifer or minor, confined water-bearing zones. The Floridan Aquifer, though relatively thin and only semi-confined in this area, is the primary source of water for consumptive use (i.e. public supply, domestic supply, irrigation, etc.). The Floridan Aquifer thickens from less than 100 feet in northern Washington County to around 700 feet in the southern part of the county. The Floridan Aquifer also plunges moving southward across the county. The intermediate system is thickest in the middle of the county—beneath the Western Highlands—and thins to the north and south (Pratt et al., 1996).

Figure 2. The Dougherty Karst Plain in Northwest Florida



**Figure 3. Floridan Aquifer Potentiometric Surface (ft, NGVD)
and Ground Water Contribution Area**



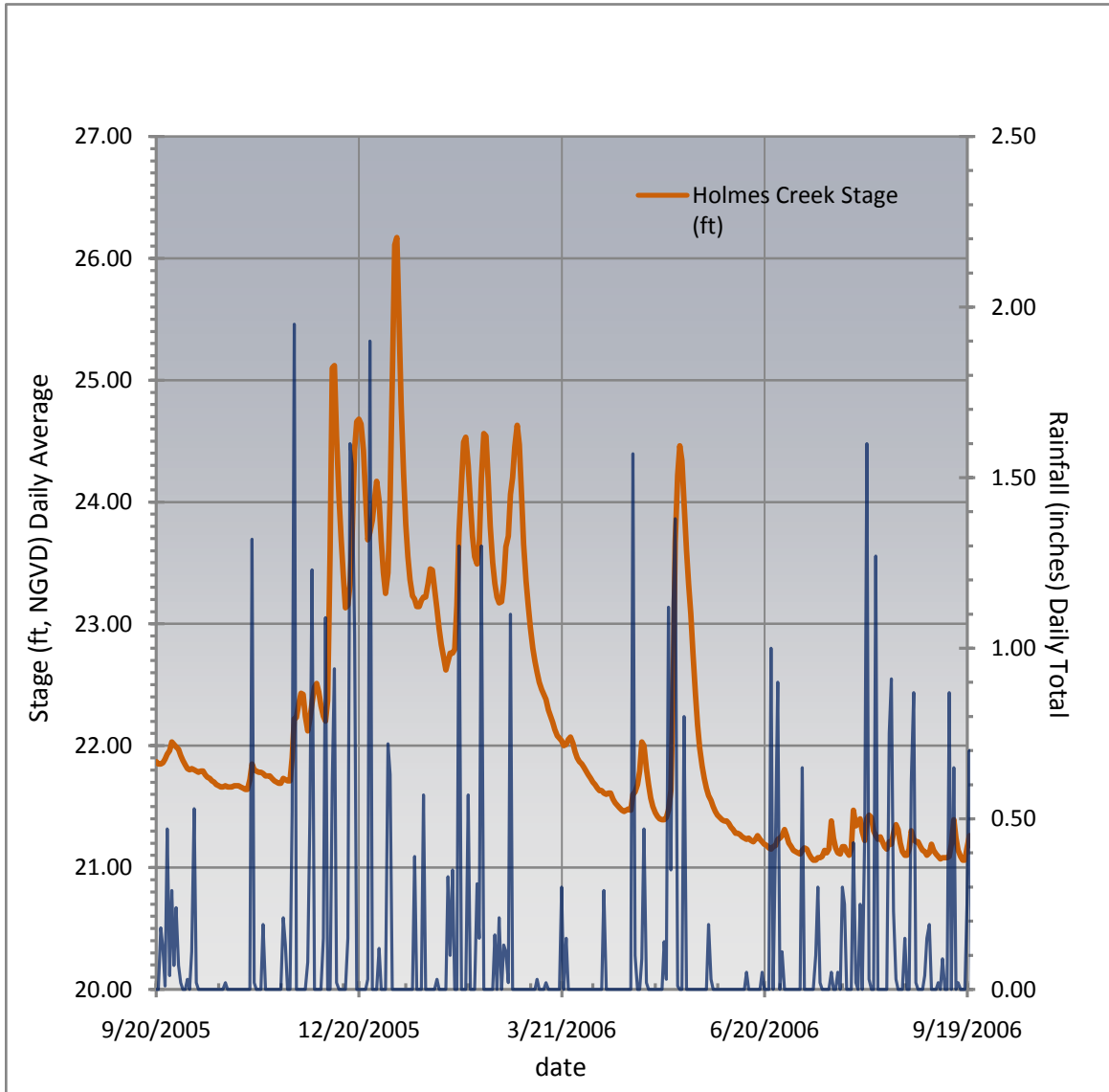
In the study area, along the middle Holmes Creek, the top of the Floridan Aquifer lies approximately 30 feet above mean sea level and is thinly confined, if at all. In the area immediately east of Vernon, Green et al. (2003, draft) identify the uppermost unit of the Floridan Aquifer as undifferentiated Marianna/Bridgeboro Limestone. The area where Alum Bluff Group sediments are thinnest corresponds to the area where springs are most heavily concentrated. This is also the area where carbonates are frequently exposed in the channel of Holmes Creek. The Floridan Aquifer potentiometric surface elevation drops from approximately 50 feet above sea level near the northernmost springs to approximately 20 feet above sea level near the confluence with the Choctawhatchee River. It is logical to expect a ground water contribution to Holmes Creek as the potentiometric surface elevation of the Floridan Aquifer is commensurate with topographic elevations in the Holmes Creek floodplain.

The District created regional potentiometric surface maps for the years 1986 (Wagner, 1989), 1991 (Peterson, et al., 1999), 1995 (Hardee et al., 1996), 1996 (Richards, 1999) and 1998 (Maloney, et al., 1999). A composite ground water contribution zone for Holmes Creek ([Figure 3](#)) interpreted from these potentiometric surface maps has an area of approximately 685 square miles (~438,000 acres). It is bounded by ground water contribution zones for the Choctawhatchee River to the west, the Chipola River to the east, and Econfinia Creek to the south (Richards, 1997). It appears the vast majority (approximately 654 square miles or 419,000 acres) of the total estimated contribution zone for Holmes Creek discharges from the middle-Washington County springs.

Precipitation and Discharge

The study period (02/25/2003 to 06/30/2006) was a period of relatively high precipitation and high stage conditions. Surface water flow conditions were a significant factor during the study, affecting the identification and quantification of spring discharge. During times of even moderately elevated stage, many of the diffuse discharge springs were indistinguishable in Holmes Creek's broad, flat floodplain. Springs easily located during times of lower flow become difficult or impossible to locate during moderate and high flow conditions. A primary objective of the inventory was to provide accurate position data so springs can be relocated, even under unfavorable conditions. [Figure 4](#) illustrates the relationship between rainfall and creek level by showing the precipitation at Chipley, located in the Holmes Creek surface water drainage basin, and the stage of Holmes Creek at the US Geological Survey (USGS) gauging station at Vernon.

Figure 4. Chipley, FL Precipitation and Holmes Creek Stage (at Vernon)



Discharge measurements taken on April 23, 1987 ([Table 1](#)) show that Holmes Creek discharge increased from 51.7 cubic feet per second (cfs) at County Road 276A to 640 cfs at County Road 284 to the south. There are small surface water streams entering Holmes Creek between CR 276A and CR 284. However, their input cannot account for the increase in discharge. Hard Labor Creek is the surface water stream that discharges into Holmes Creek between these two measuring points. Its contribution was a mere 18.6 cfs on that day. The majority of the increase in flow is attributable to

the more than 50 Floridan Aquifer springs that exist along the banks of Holmes Creek between CR 276A and CR 284 ([Appendix A, Figure A-1](#)).

Table 1. Holmes Creek Discharge (cfs)

Measurement Location	10/14/1987	9/24/1987	7/23/1987	4/23/1987
Hard Labor Creek	5.11	33.8	21.8	18.6
Holmes Cr @ CR276A	7.75	29.9	59.3	51.7
Holmes Cr @ New Hope (CR284)	569	839	683	640
Holmes Net Increase	556	775	602	570

Net increases were calculated for four discharge measurements made throughout 1987. The discharge at CR 276A to the north and Hard Labor Creek were subtracted from the discharge at CR 284 to the south. The calculated net Holmes Creek discharges for 1987 reflect a median discharge increase of 586 cfs between CR 276A and CR 284.

A total of 51 springs were identified in the Holmes Creek basin. Thirty-nine springs were identified north of the city of Vernon ([Appendix A, Figure A-2](#)). Twelve more springs were identified in the southern portion of the study area between Vernon and CR 284 ([Appendix A, Figure A-3](#)). Springs in the Holmes Creek Basin include those with typical fissure-type vents and those that incorporate areas of diffuse, upward percolation of ground water into pools and runs. Springs discharging via diffuse percolation are termed seep springs (Copeland, 2003). Specific data, pictures and descriptions of individual springs are provided in [Appendix B](#). In addition to the springs, there are large areas of ground water discharge in the channel of Holmes Creek. Some of the areas can be seen as sand boils in the bottom but others contribute water imperceptibly.

There are ten named springs along Holmes Creek that range between second and fourth magnitude. The District made site visits to these named springs, plus many more unnamed springs and seeps, and completed discharge and field water quality measurements where possible. The discharge measurements are presented in [Table 2](#).

The system has no first-magnitude springs (discharge greater than 100 cfs). While Cypress Spring has been measured at first-magnitude discharge on one occasion it is still considered a second magnitude (10-100 cfs) spring because its median discharge over the period of record is 88 cfs. It is one of four springs measured that are currently classified as second magnitude. Six more springs with fissure vents were measured and five of those were classed as third magnitude (1-10 cfs). One of the seep vents (UNNAMED-303956085394801) also falls into the third-magnitude category. Piney Woods Spring has a conduit-type vent but its discharge was such that it is considered to be a fourth-magnitude (0.22-1 cfs). All other seep springs fall into the forth-magnitude category or smaller. Future discharge measurements may have some affect on the ratings of individual springs. Burnt Out Spring discharges directly to Holmes Creek. Skipper Spring and Shellcracker Spring were surrounded by submerged wetlands and accurate discharge estimates could not be made.

Table 2. Springs Discharge Measurements

NWF ID	Spring Name	Date	Discharge (cfs)	Estimated Discharge (cfs)
8087	CYPRESS SPRING	11/3/2004	90.5	
8088	BECKTON SPRING	5/15/2003	22.1	
8089	HIGHTOWER SPRING	5/21/2003	2.52	
8090	MULLET SPRING	4/28/2004	21.2	
8300	SHELLCRACKER SPRING	10/22/2003	2.52	
8301	CLEMMONS SPRING	5/28/2003	5.87	
8302	JACK PAUL HEADSPRING	5/21/2003	12.7	
8303	BRUNSON LANDING SPRING	5/21/2003	5.86	
8365	GALLAWAY SPRING	4/6/2004	5.25	
8366	PINEYWOOD SPRING	5/28/2003	0.67	
8604	UNNAMED-303956085394801	11/19/2003		7.0
8605	UNNAMED-304002085394901	11/19/2003		<1.0
8606	UNNAMED-304002085395001	11/19/2003		1-2 gpm
8614	UNNAMED-303956085401001	10/23/2003	2.06	
8615	UNNAMED-303946085401901	10/23/2003	0.54	
8616	UNNAMED-303941085401901	10/23/2003		0.27
8617	UNNAMED-303935085402901	10/23/2003	0.01	
8618	UNNAMED-303940085404001	10/23/2003		2 gpm
8619	UNNAMED-303938085404301	10/23/2003	0.05	
8620	UNNAMED-303913085411701	10/22/2003		2.1 gpm
8683	UNNAMED-303934085403401	10/22/2003		2 gpm
8684	UNNAMED-303942085402401	10/22/2003	0.22	
8685	UNNAMED-303938085401801	10/22/2003		3 gpm
8686	UNNAMED-303939085401901	10/22/2003		3 gpm
8687	UNNAMED-303937085404001	10/23/2003		0.05
8689	UNNAMED-303937085402901	10/23/2003		3.8 gpm
8690	UNNAMED-303939085402501	10/23/2003		0.01
8692	UNNAMED-303941085401701	10/23/2003		0.50
8695	UNNAMED-303949085401702	10/23/2003		0.9 gpm
8696	UNNAMED-303955085401001	10/23/2003		0.9 gpm
8904	UNNAMED-304025085390401	3/18/2004		4 gpm
8906	UNNAMED-304027085390301	3/18/2004		1.0

Discharge Units

cfs – cubic feet per second

gpm – gallons per minute

Water Quality

As part of the spring inventory process, field water quality measurements were conducted during site visits where possible. Field measurements were made for water temperature (degrees C), dissolved oxygen (mg/L) (DO), pH (standard units), and specific conductivity (uS/cm). [Table 3](#) shows the results of these measurements.

Table 3. Springs Field Water Quality Measurements

NWF ID	Spring Name	Date	Temperature (Celcius)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	pH (su)
8087	CYPRESS SPRING	5/15/2003	20.4	220	4.72	6.8
8088	BECKTON SPRING	5/15/2003	20.8	271	4.01	6.9
8089	HIGHTOWER SPRING	5/21/2003	20.6	210	2.86	7.2
8090	MULLET SPRING	3/18/2004	21.0	217	8.61	7.9
8300	SHELLCRACKER SPRING	10/22/2003	20.0	259	5.07	6.4
8301	CLEMMONS SPRING	5/28/2003	20.4	265	3.50	7.6
8302	JACK PAUL HEADSPRING	5/21/2003	20.6	259	1.88	7.4
8303	BRUNSON LANDING SPRING	5/21/2003	20.8	219	2.36	7.3
8365	GALLAWAY SPRING	4/6/2004	19.3	264	3.37	8.3
8366	PINEYWOOD SPRING	6/17/2003	20.2	212	2.64	7.0
8428	MILLERS FERRY SPRING	5/29/2003	20.8	237	2.02	6.9
8588	BURNT OUT SPRING	10/22/2003	20.4	221	5.42	7.7
8589	UNNAMED-304042085384501	3/18/2004	20.7	215	4.52	6.9
8590	UNNAMED-304030085385301	3/18/2004	22.2	190	9.73	7.1
8591	UNNAMED-304029085385401	3/18/2004	23.6	212	7.77	7.3
8592	UNNAMED-304029085385501	3/18/2004	20.8	212	3.73	7.3
8593	UNNAMED-304029085385502	3/18/2004	23.9	206	7.09	7.1
8594	UNNAMED-304029085385503	3/18/2004	24.6	205	5.62	8.2
8595	UNNAMED-304027085385501	3/18/2004	20.5	223	4.81	7.0
8597	UNNAMED-304029085385901	3/18/2004	19.8	191	1.33	6.5
8598	UNNAMED-304029085385902	3/18/2004	20.5	215	4.26	7.2
8599	UNNAMED-304027085380101	3/18/2004	22.4	204	8.61	7.9
8600	UNNAMED-304025085391101	3/18/2004	19.9	222	1.79	7.0
8601	UNNAMED-304023085391001	3/18/2004	19.7	238	3.15	7.4
8602	UNNAMED-304015085391701	3/18/2004	20.2	221	5.00	7.6
8603	BURNT SOCK SPRING	11/19/2003	19.9	220	0.11	7.2
8604	UNNAMED-303956085394801	11/19/2003	19.6	224	0.92	7.3
8605	UNNAMED-304002085394901	11/19/2003	18.6	166	0.17	7.3
8606	UNNAMED-304002085395001	11/19/2003	18.7	230	0.26	7.3
8609	UNNAMED-303953085400201	11/19/2003	18.4	214	0.79	6.7
8611	UNNAMED-303950085400901	11/19/2003	21.3	220	1.39	6.3
8613	UNNAMED-303949085401701	10/23/2003	20.4	226	4.54	7.6
8614	UNNAMED-303956085401001	10/23/2003	20.6	220	4.84	7.6
8615	UNNAMED-303946085401901	10/23/2003	20.0	227	4.64	7.6
8616	UNNAMED-303941085401901	10/23/2003	20.5	226	4.63	7.3
8617	UNNAMED-303935085402901	10/23/2003	18.3	237	2.48	7.0
8618	UNNAMED-303940085404001	10/23/2003	19.3	171	5.42	7.0
8619	UNNAMED-303938085404301	10/23/2003	19.1	225	5.89	6.4
8620	UNNAMED-303913085411701	10/22/2003	20.3	255	4.39	6.9
8625	UNNAMED - 303440085502101	4/6/2004	20.5	193	0.51	8.2
8626	IBIS SPRING	4/6/2004	19.6	176	1.27	8.0
8627	SKIPPER SPRING	4/6/2004	19.6	361	1.91	7.7
8683	UNNAMED-303934085403401	10/22/2003	20.2	226	2.87	7.1

NWF ID	Spring Name	Date	Temperature (Celcius)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	pH (su)
8684	UNNAMED-303942085402401	10/22/2003	21.1	224	4.84	7.3
8685	UNNAMED-303938085401801	10/22/2003	21.8	213	6.01	7.3
8686	UNNAMED-303939085401901	10/22/2003	21.3	222	4.99	7.5
8687	UNNAMED-303937085404001	10/23/2003	20.2	209	6.41	7.1
8689	UNNAMED-303937085402901	10/23/2003	18.3	237	2.48	7.0
8690	UNNAMED-303939085402501	10/23/2003	20.4	224	4.47	7.2
8692	UNNAMED-303941085401701	10/23/2003	21.0	150	5.01	7.5
8695	UNNAMED-303949085401702	10/23/2003	19.9	224	3.79	7.5
8696	UNNAMED-303955085401001	10/23/2003	20.4	206	5.37	7.5
8904	UNNAMED-304025085390401	3/18/2004	20.6	227	2.65	7.0
8905	UNNAMED-304025085390402	3/18/2004	21.7	215	4.55	7.0
8906	UNNAMED-304027085390301	3/18/2004	21.1	208	4.53	7.3

Temperature can be highly variable in surface water dependent on atmospheric conditions. Ground water temperatures tend to be much more stable. For instance, long-term water temperature readings at Wakulla Springs—a first-magnitude Floridan Aquifer spring in Wakulla County—reveal that the temperature typically has a median value of 20.8 degrees C (n=4120, mean=20.8, stdev=0.11). The median temperature of the Holmes Creek springs (20.5 degrees C) compares well with this typical Floridan Aquifer value.

A surface water body with a DO value of less than 5.0 mg/L is considered impaired. The longer ground water remains in the aquifer, however, the lower the DO concentration typically becomes due to oxidation reactions with the matrix material. DO values in the Floridan Aquifer in this area typically have a median value of 0.16 (n=30, mean=1.76, stdev=2.39). The DO values of the Holmes Creek Springs (median=4.39 mg/L, n=55, stdev=2.19) are higher than would be normally expected in the Floridan Aquifer.

The majority spring pH values indicate that the water is well buffered. This is typical of water that has remained in the Floridan Aquifer for any length of time. The dissolution of limestone by acidic rain and surface runoff increases the dissolved minerals in ground water and creates the characteristic karst topography of the Dougherty Karst Plain. Typical Floridan Aquifer pH values have a median of 7.79 standard units (n=30, mean=7.76, stdev=0.68). The median value of the Holmes Creek springs is 7.3 standard units (n=55, stdev=0.43).

Specific conductivity is a measure of the ion content of water. Rain water and surface water not influenced by ground water input usually have a specific conductivity value of less than 50 uS/cm. The median specific conductivity value for Floridan Aquifer wells recently sampled in this area is 256 uS/cm (n=30, mean=333, stdev=223). The median specific conductivity of the Holmes Creek springs is 222 (n=55, stdev=29.9) indicating the springs are primarily influenced by the Floridan Aquifer.

The high DO values and lower pH and specific conductivity values are probably the result of high local recharge. This means an influx of lower-residence time, less mineralized, more acidic ground

water into the Floridan Aquifer before it discharges from the springs. This seems to indicate that the springs along Holmes Creek are particularly vulnerable to proximate land use activities. There is no doubt, however, that these springs discharge Floridan Aquifer water.

A set of field parameters taken in mid-stream of Holmes Creek below the northern springs area (just south of Vernon on 5/21/2003, during moderate flow conditions) yielded field parameter readings as follows: water temperature=21.3 degrees C; DO=7.56 mg/L; pH=7.42 standard units; and specific conductivity=219 uS/cm. These values tend much closer to ground water than surface water values for the most part. DO is understandably higher than ground water values because aeration occurs rapidly once ground water is discharged. Temperature also tends to respond quickly to atmospheric conditions and becomes unreliable in differentiating between surface water and ground water. The standard conductivity is the most compelling evidence that a large part of the creek discharge at this location originates from ground water sources. During periods of high stage, when there is increased surface water volume, the ground water signature is muted. Thus the water chemistry of Holmes Creek varies between surface water and ground water values depending on stage conditions.

CONCLUSIONS

- *Fifty-seven springs were identified during this study in the mid-Washington County portion of the Holmes Creek basin. There may be more springs that could be distinguished under lower stage conditions.*
- *Under moderate to low-flow conditions, ground water makes up the majority of Holmes Creek's discharge and the water discharged from the Holmes Creek springs is predominantly influenced by the quality of ground water in the Floridan Aquifer. Under high-flow conditions, the majority of the flow in Holmes Creek is surface water runoff with ground water a smaller component of the total flow.*
- *The ground water contribution zone for the Holmes Creek springs is large and encompasses most of the Creek's surface water basin. There is an order of magnitude increase in Holmes Creek discharge due to spring flow contribution during moderate to low flow conditions..*
- *Water quality in the Floridan Aquifer and the springs' discharge is vulnerable to land use activities in the contribution zone. The water quality measurements collected at the springs indicate a short recharge time. Therefore, the springs are particularly vulnerable to those activities proximal to them.*

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APPENDIX A

FIGURES

Figure A-1. Holmes Creek Spring Locations

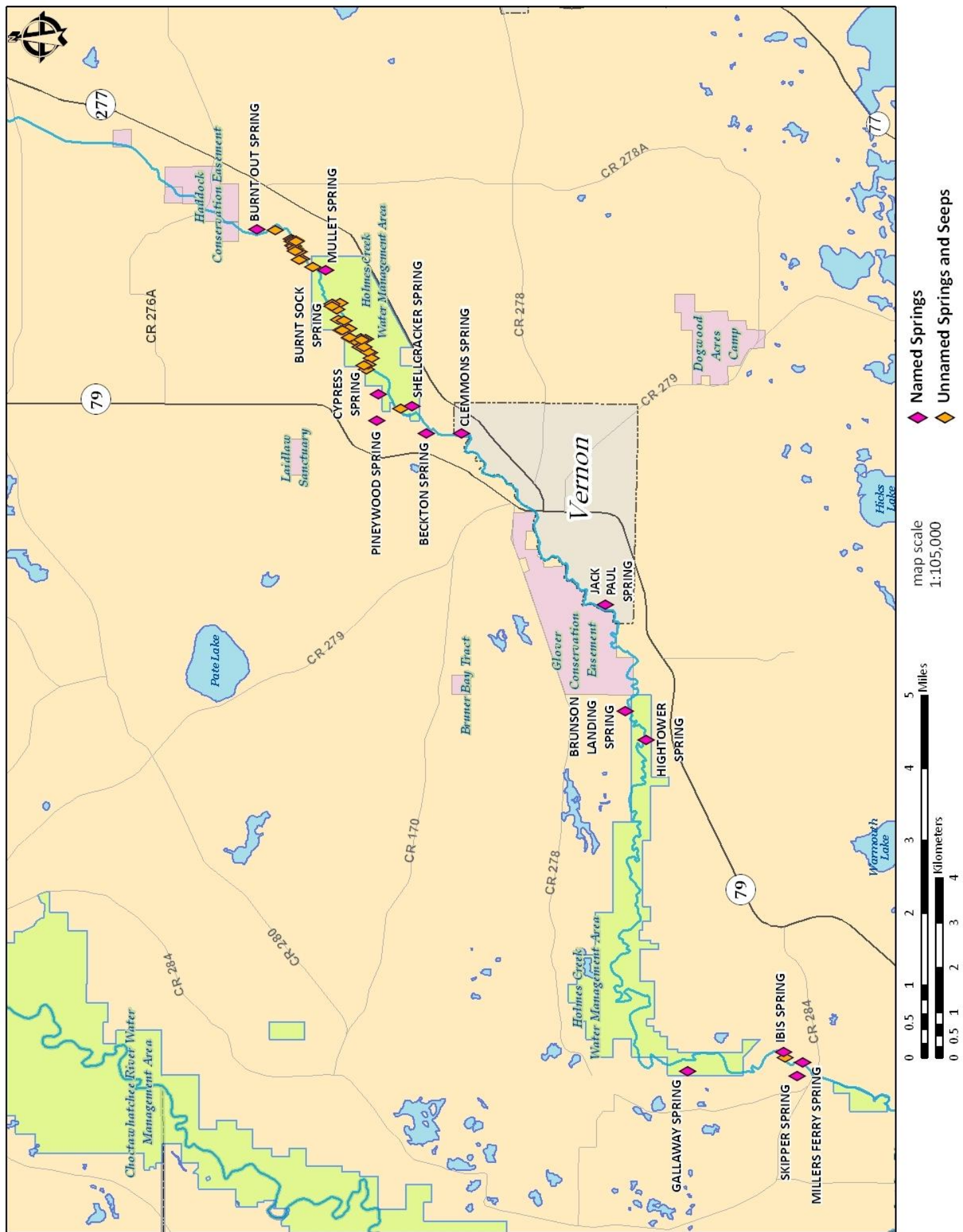


Figure A-2. Holmes Creek Springs, North of Vernon

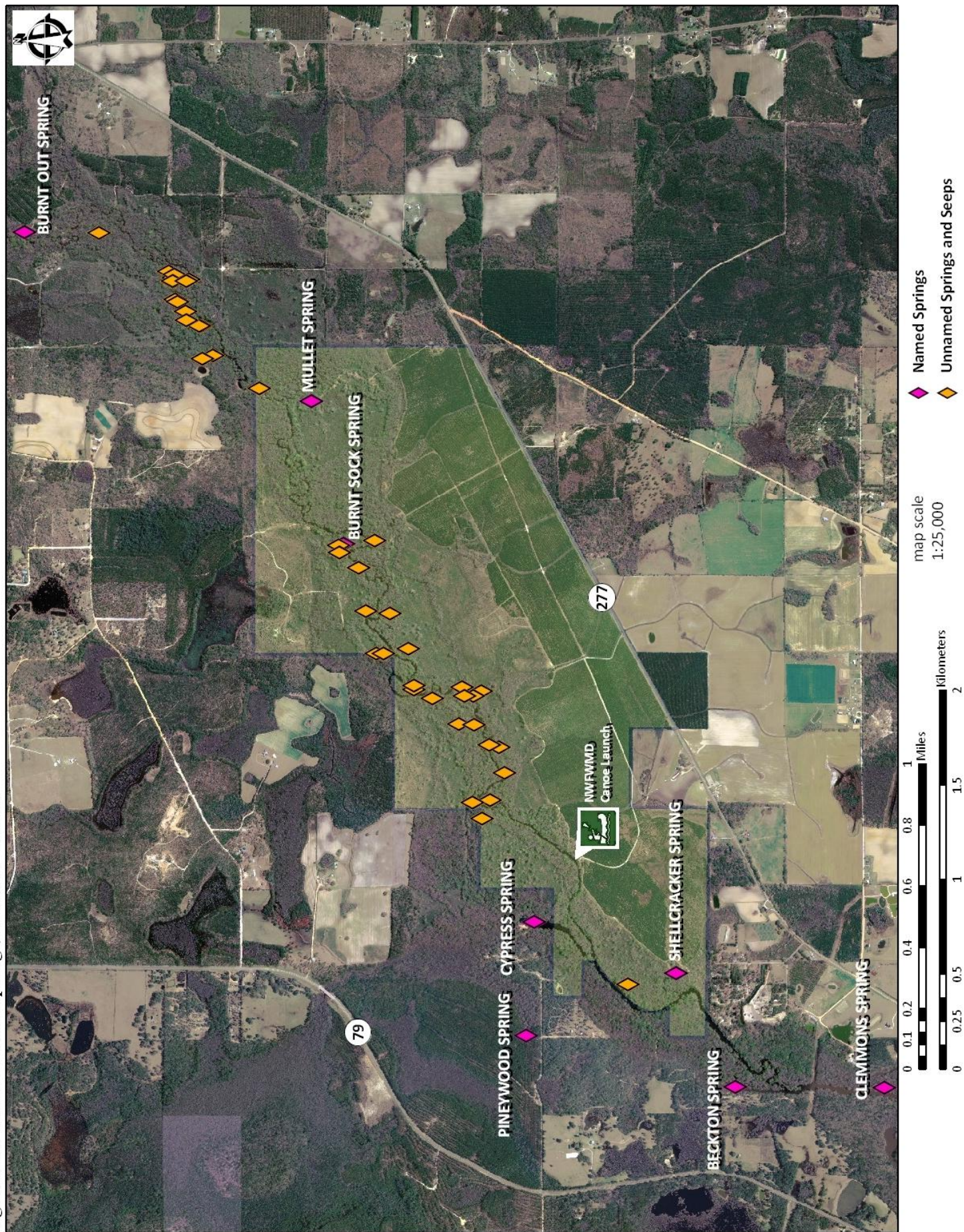
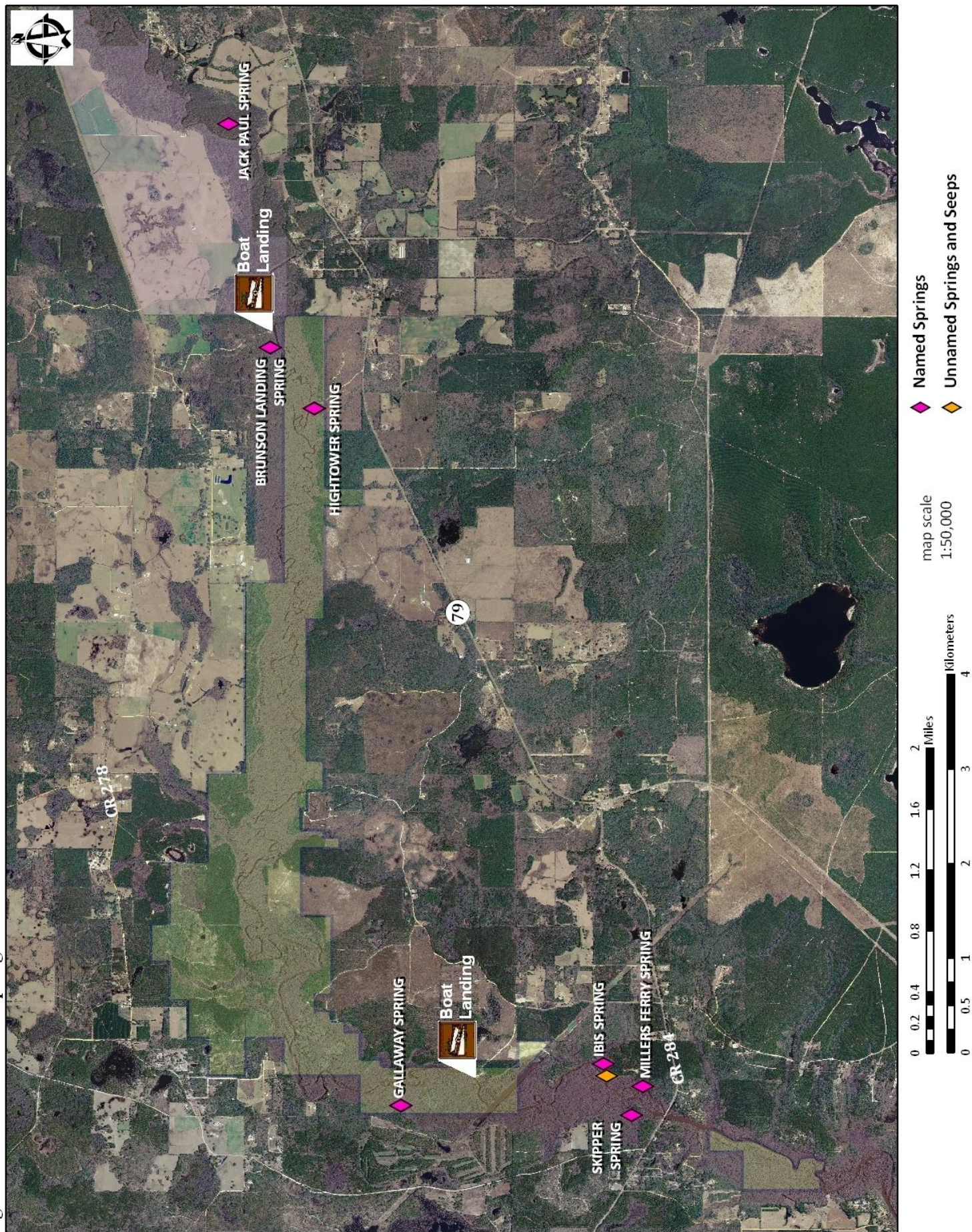


Figure A-3. Holmes Creek Springs South of Vernon



APPENDIX B

SPRINGS

<u>Spring Name</u>	<u>NWF ID#</u>	<u>Latitude</u>	<u>Longitude</u>
CYPRESS SPRING	8087	30°39'29.16"N	85°41'03.84"W

<u>Field Parameters</u>	<u>Date</u>
Discharge Summary:	220
5/15/2003 101 cfs	6.8
8/4/2004 86.5 cfs	4.72
11/3/2004 90.5 cfs	20.4
Spring Magnitude: Second	

Description

With its strong current, lush banks and deep sapphire waters, Cypress Spring is one of the most beautiful springs in Northwest Florida. The spring discharges from two vents in the limestone boulders at the bottom of the spring pool. The diameter of the spring pool is approximately 150 feet and the maximum depth is 29 feet. A large surface boil is visible over both vents. The pool is impounded on two sides by a sandbag wall and on a third side by an earthen berm. Behind the western portion of the sandbag wall is an artificial beach. There is a private dock entering on the west side of the spring pool. The banks surrounding the pool are heavily vegetated with Cypress and Tupelo. The Cypress Spring run enters Holmes Creek from the west, approximately 0.25 miles downstream from the headspring. Cypress Spring is a popular destination on summer weekends with boaters, canoeists and kayakers, and swimmers all vying for space in the pool. Because the land surrounding the spring is private property, the sole public access to the spring is by traveling up the spring run from Holmes Creek.



Spring Name	NWF ID#	Latitude	Longitude
BECKTON SPRING	8088	30°38'54.948"N	85°41'37.045"W

Field Parameters	5/15/2003	Date
Discharge Summary:	271	Specific Conductance (uS/cm)
6/10/2002 26.2 cfs	6.9	pH (su)
5/15/2003 22.1 cfs	4.01	Dissolved O₂ (mg/L)
Spring Magnitude: Second	20.8	Temperature (°C)

Description

Beckton Spring is situated in the floodplain of Holmes Creek. The vent is an opening in the limestone bottom. The diameter of the spring pool is approximately 200 feet and the maximum depth is 21 feet. A slight surface boil is visible. There are several tree trunks in the pool near the vent. The banks surrounding the pool on three sides are heavily vegetated and show little erosion. The spring run enters Holmes Creek from the east approximately a half-mile downstream from Big Pine boat ramp. The spring is approximately 0.2 miles up the run and can be accessed by boat. The spring banks here are private property.

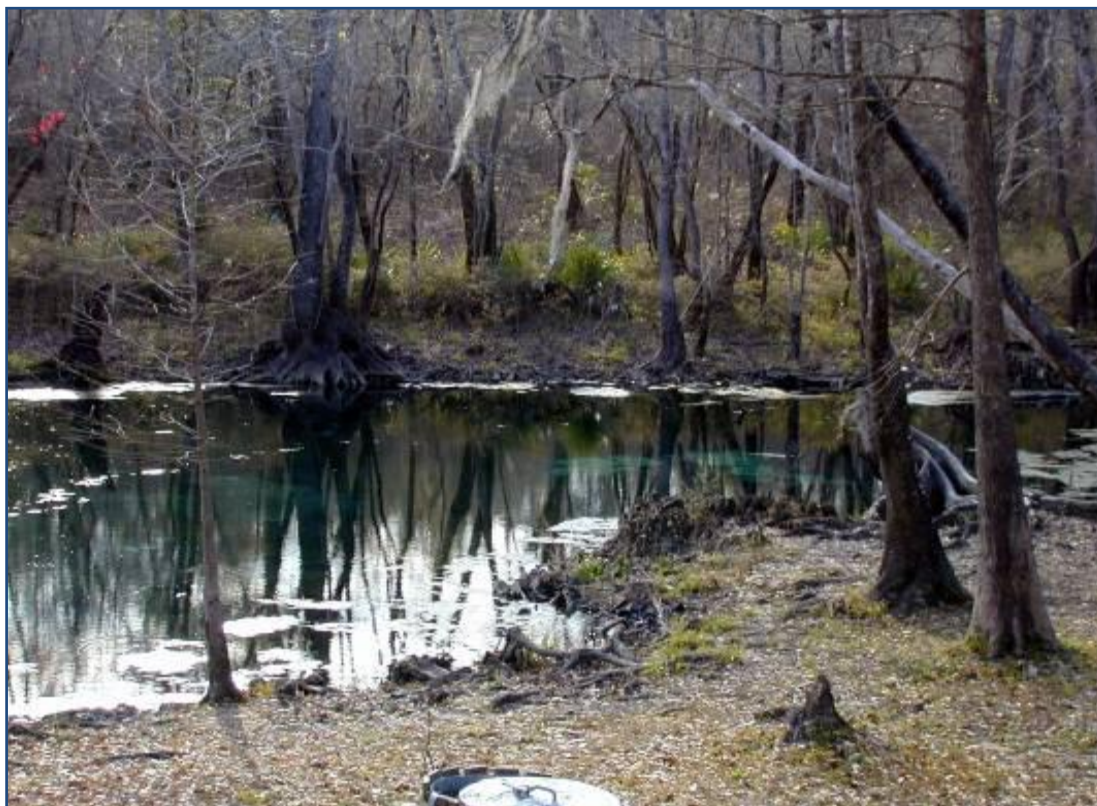


Spring Name	NWF ID#	Latitude	Longitude
HIGHTOWER SPRING	8089	30°36'18.305"N	85°45'55.212"W

Field Parameters	5/21/2003	Date
Discharge Summary:	210	Specific Conductance (uS/cm)
7/30/1987 2.60 cfs	7.2	pH (su)
5/21/2003 2.52 cfs	2.86	Dissolved O₂ (mg/L)
Spring Magnitude: Third	20.6	Temperature (°C)

Description

Hightower Springs is situated adjacent to Hightower boat ramp in the floodplain of Holmes Creek. There appear to be several vents or a crevasse with numerous discharge areas but the entire spring pool is smothered with sand so that the discharge appears as very active sand boils on the bottom. The diameter of the spring pool is approximately 75 feet and the maximum depth is 21 feet. No surface boil is visible. The west bank of the pool is heavily vegetated and shows little erosion. The east bank is part of the public park and the bank shows more traffic wear and erosion. There are several tree trunks in the pool and the bottom is soft sediment. It has been reported by residents of the area that, at one time, there was no sand in the spring pool and there was a clear limestone opening that discharged ground water. A spring run approximately 100 feet long enters Holmes Creek downstream of the boat ramp. The spring is on Water Management District land.



<u>Spring Name</u>	<u>NWF ID#</u>	<u>Latitude</u>	<u>Longitude</u>
MULLET SPRING	8090	30°40'06.334"N	85°39'19.944"W

<u>Field Parameters</u>	<u>3/18/2004</u>	<u>Date</u>
Discharge Summary:	217	Specific Conductance (uS/cm)
11/29/2000 6.57 cfs	7.9	pH (su)
5/8/2001 11.0 cfs	8.61	Dissolved O₂ (mg/L)
4/8/2004 21.2 cfs	21.0	Temperature (°C)
Spring Magnitude:	Second	

Description

Mullet Spring is situated in the floodplain of Holmes Creek. Discharge from this spring issues from the ground as a number large-scale seeps. These seeps consist of a series of large, shallow, bowl-shaped depressions with water seeping from a limestone contact around the perimeter and percolating up through the sediments. The general area contained by the combined depressions is approximately seven to ten acres. The discharge from the bays collects into surface rills that join to form the spring run. This run flows to the southwest and enters Holmes Creek approximately 2.2 miles downstream from the Highway 276A bridge. The banks surrounding the depression are heavily vegetated and show little erosion though the uplands nearby have been recently timbered. The spring is on Water Management District land and shows no sign of utilization.



Spring Name	NWF ID#	Latitude	Longitude
SHELLCRACKER SPRING	8300	30°39'04.921"N	85°41'14.383"W

Field Parameters	10/22/2003	Date
Discharge Summary:	259	Specific Conductance (uS/cm)
10/25/2001 1.59 cfs	6.4	pH (su)
10/22/2003 2.52 cfs	5.07	Dissolved O₂ (mg/L)
Spring Magnitude: Third	20.0	Temperature (°C)

Description
 Shellcracker Spring is situated in the floodplain of Holmes Creek. The spring issues from a small vent in the limestone and more water enters the pool and run via small sand boils. No surface boil was visible. The spring pool is approximately 30 feet in diameter and 15 feet deep at the vent. There is also a seep area that contributes flow to the spring run. The run is approximately 200 feet long and enters Holmes Creek from the east. The mouth of the run is located approximately 0.2 miles upstream from Big Pine boat ramp. The banks surrounding the vent and run are heavily vegetated and show little erosion. The spring is on Water Management District land and is used for swimming and fishing.



Spring Name	NWF ID#	Latitude	Longitude
CLEMMONS SPRING	8301	30°38'29.4"N	85°41'37.5"W

Field Parameters	5/28/2003	Date
Discharge Summary:	265	Specific Conductance (uS/cm)
10/25/2001 3.81 cfs	7.6	pH (su)
5/28/2003 5.87 cfs	3.5	Dissolved O₂ (mg/L)
Spring Magnitude: Third	20.4	Temperature (°C)

Description

Clemmons Spring is situated in the floodplain of Holmes Creek. There are two vents associated with the spring. The main vent is at the head of the run and the other is just north of the mouth of the run on the bank of Holmes Creek. Both vents issue water from cracks in the limestone bottoms of their pools. The main vent has a diameter of approximately 100 feet and a maximum depth of 25 feet. The second vent has a diameter of approximately ten feet and a maximum depth of five feet. Neither vent had a surface boil. The banks surrounding the pools and run are heavily vegetated. A bluff rises approximately 20 feet high on the southeast side of the run. A number of houses have been built on the bluff and there is some erosion from that area. The spring run enters Holmes Creek from the east approximately 0.9 miles downstream from Big Pine boat ramp. The spring is on privately owned land and there is evidence that it is used for fishing and swimming.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
JACK PAUL HEADSPRING	8302	30°36'46.782"N	85°44'01.842"W

<u>Field Parameters</u>	5/21/2003	Date
Discharge Summary:	259	Specific Conductance (uS/cm)
10/25/2001 9.45 cfs	7.4	pH (su)
5/21/2003 12.7 cfs	1.88	Dissolved O₂ (mg/L)
Spring Magnitude: Third	20.6	Temperature (°C)

Description

Jack Paul Spring is situated in the floodplain of Holmes Creek. There are two vents in the spring pool. The larger of the two vents has a surface boil but the smaller does not. The diameter of the spring pool is approximately 40 feet and the maximum depth is 11 feet. The spring pool is approximately 0.35 miles up the run from Holmes Creek. There is another vent in the run approximately 422 feet downstream from the spring pool. This vent is a crevasse in the limestone and there was a distinct surface boil. The banks surrounding the pool and run are heavily vegetated and show little erosion. There is a berm on the southwest side of the run for its entire length. The spring run enters Holmes Creek from the east approximately 1.19 miles upstream from Two Creeks boat ramp. The spring is on privately owned land.



<u>Spring Name</u>	<u>NWF ID#</u>	<u>Latitude</u>	<u>Longitude</u>
BRUNSON LANDING SPRING	8303	30°36'33.12"N	85°45'30.90"W

<u>Field Parameters</u>	5/21/2003	<u>Date</u>
Discharge Summary:	219	Specific Conductance (uS/cm)
10/25/2001 3.37 cfs	7.3	pH (su)
5/21/2003 5.86 cfs	2.36	Dissolved O₂ (mg/L)
Spring Magnitude: Third	20.8	Temperature (°C)

Description

Brunson Spring is made up of two vents and a seep located adjacent to Brunson Landing boat ramp in the floodplain of Holmes Creek. The main vent is an opening in the bottom of the spring pool. The diameter of the spring pool is approximately 30 feet and the maximum depth is 15 feet. The second vent is in a separate spring pool with a diameter of approximately six feet and a depth of two feet. The main vent has a surface boil but the smaller vent does not. The banks surrounding the pools are heavily vegetated and show little erosion. There are several tree trunks in the both pools near the vents. The run from the main vent splits and enters Holmes Creek in two different locations. Runs from the second vent and seep enter the main vent run on the upstream branch before it enters Holmes Creek. The upstream mouth of the spring run is approximately 370 feet downstream from the boat ramp. The main vent is approximately 370 feet up the run from the creek on privately owned land. There is evidence that the spring is used for swimming.

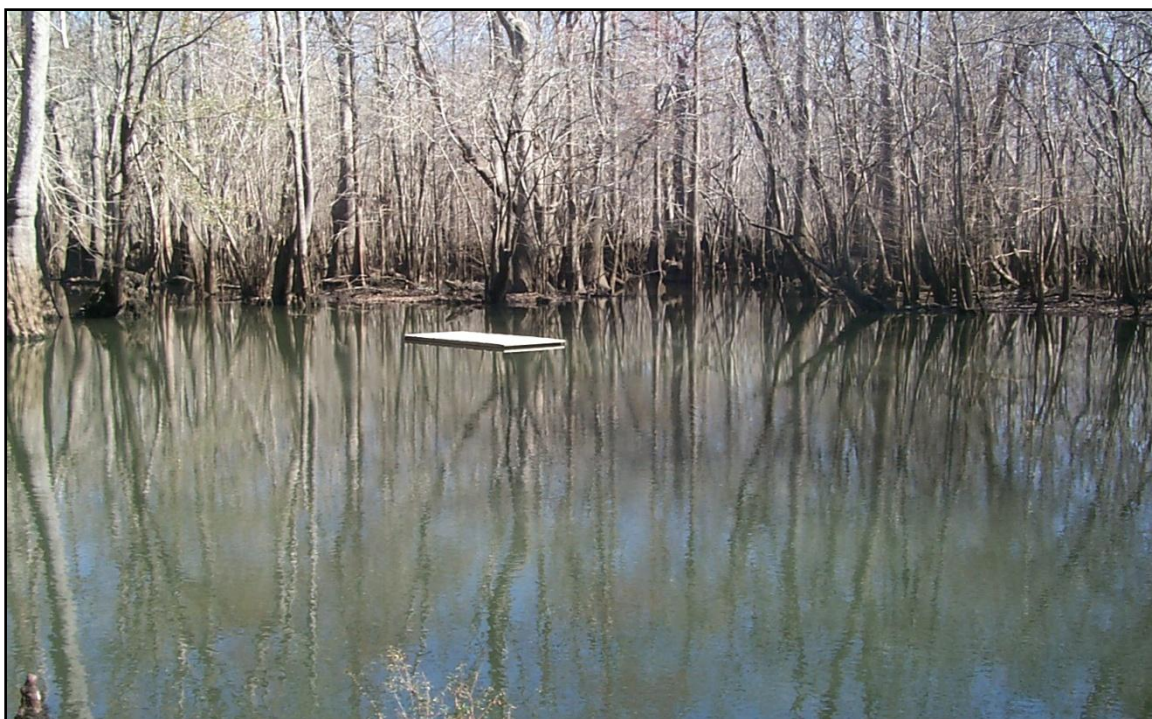


<u>Spring Name</u>	NWF ID#	Latitude	Longitude
GALLAWAY SPRING	8365	30°35'51.2"N	85°50'32.2"W

<u>Field Parameters</u>	4/6/2004	Date
Discharge Summary:	264	Specific Conductance (uS/cm)
4/6/2004 5.25 cfs	8.3	pH (su)
Spring Magnitude: Third	3.37	Dissolved O₂ (mg/L)
	19.3	Temperature (°C)

Description

Gallaway Spring is situated in the floodplain of Holmes Creek. The vent is beneath a shelf of limestone. The diameter of the spring pool is approximately 100 feet and the maximum depth is 27 feet. No surface boil was visible. The banks surrounding the pool are gently sloping and heavily vegetated. There is little erosion. There are several tree trunks in the pool near the vent. The spring run enters Holmes Creek from the east approximately 0.56 miles upstream from Big Pine Boat Landing. The spring is approximately 0.3 miles up the run. The spring is on privately owned land. There is evidence that it is used for swimming and diving. To locate the spring, start from the District boat ramp north of the CR 284 bridge over Holmes Creek then travel upstream 0.6 mi. As the second s-curve heads north look for the spring run on the west bank.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
PINEYWOOD SPRING	8366	30°39'30.795"N	85°41'26.351"W

<u>Field Parameters</u>		Date
Discharge Summary:		6/17/2003
5/28/2003	0.67 cfs	212
2/11/2005	0.73 cfs	7.0
Spring Magnitude:	Fourth	2.64
		20.2

Description

Pineywood Spring is in the floodplain of Holmes Creek. The vent is a fissure in the limestone bottom of the spring pool. The diameter of the spring pool is approximately 50 feet and the maximum depth is 10.5 feet. No surface boil was visible. The banks surrounding the pool are heavily vegetated and show little erosion. The run empties into Cypress Creek, a tributary to Holmes Creek. There is rubble that was recently removed from the spring vent on the bank and additional debris remains in the vent. This debris may be responsible for the decreased discharge from the spring. The spring is on privately owned land and shows no utilization.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
MILLERS FERRY SPRING	8428	30°34'28.1"N	85°50'25.5"W

<u>Field Parameters</u>	5/29/2003	Date
Discharge Summary:	237	Specific Conductance (uS/cm)
	6.9	pH (su)
Spring Magnitude:	2.02	Dissolved O₂ (mg/L)
	20.8	Temperature (°C)

Description

Millers Ferry Spring is situated in the floodplain of Holmes Creek. The vent is beneath a limestone ledge and is approximately three meters in diameter. The diameter of the spring pool is approximately 150 feet and the maximum depth is 12.5 feet. No surface boil was visible. The spring pool is cut into the east bank of Holmes Creek and all flow immediately enters the creek. The spring is in the stream channel of Holmes Creek approximately 0.25 miles north of Millers Ferry Landing. The spring shows no evidence of commercial utilization. There is evidence that it is used for swimming and fishing. The pool banks are gently sloping and heavily vegetated with cypress, red maple, and tupelo.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
Burnt Out Spring	8588	30°40'55.32"N	85°38'45.66"W
<u>Field Parameters</u>	10/22/2003	Date	
Discharge Summary:	221	Specific Conductance (uS/cm)	
	7.7	pH (su)	
Spring Magnitude: Third (est.)	5.42	Dissolved O₂ (mg/L)	
	20.4	Temperature (°C)	

Description

This is the first significant spring flowing into Holmes Creek on the northern end of the study area. It is a limestone crevasse in the creek bottom approximately 0.8 miles downstream from the CR 267A bridge. Water from the vent enters the creek directly. There is a significant surface boil at times of low water. The west bank of the creek is heavily vegetated and shows little erosion. There is a private road loop on the east bank with some erosion evident. Although the spring discharge could not be measured, the strength of the spring boil is indicative of an estimated third-magnitude spring. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304042085384501	8589	30°40'42.524"N	84°38'45.939"W

Field Parameters	3/18/2004	Date
Discharge Summary:	215	Specific Conductance (uS/cm)
3/18/2004 0.5 cfs	6.9	pH (su)
Spring Magnitude: Fourth	4.52	Dissolved O₂ (mg/L)
	20.7	Temperature (°C)

Description

This unnamed spring consists of a large area of small seeps and sand boils approximately three acres in size. The seeps are located in the floodplain of Holmes Creek approximately 1.2 miles downstream from the CR 267A bridge. Water seeps into a pool from a surrounding limestone outcrop. There was no surface boil. The run is approximately 50 feet long and enters the creek from the west. The banks of the seep area and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable during high water periods.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304030085385301	8590	30°40'30.618"N	84°38'53.827"W

Field Parameters	3/18/2004	Date
Discharge Summary:	190	Specific Conductance (uS/cm)
3/18/2004 3 gpm	7.1	pH (su)
Spring Magnitude: Sixth	9.73	Dissolved O₂ (mg/L)
	22.2	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. Water discharges from a several sand boils in a three foot wide shallow pool. The banks of the seep area and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable when the floodplain is submerged during times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304029085385401	8591	30°40'29.637"N	84°38'54.37"W

Field Parameters	3/18/2004	Date
Discharge Summary:	212	Specific Conductance (uS/cm)
3/18/2004 0.5 cfs	7.3	pH (su)
Spring Magnitude: Fourth	7.77	Dissolved O₂ (mg/L)
	23.6	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. Water discharges from seeps and small sand boils located in the bottom of a silty run to Holmes Creek. The banks of the seep area and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable when the floodplain is submerged during times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304029085385501	8592	30°40'29.95"N	85°38'55.786"W

Field Parameters	3/18/2004	Date
Discharge Summary:	212	Specific Conductance (uS/cm)
Not measured	7.3	pH (su)
Spring Magnitude:	3.73	Dissolved O₂ (mg/L)
Unknown	20.8	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. Water discharges from several small sand boils. The banks of the seep area and run are heavily vegetated and show little erosion. This spring is only visible during low water periods when the floodplain is exposed.



<u>Spring Name</u>	<u>NWF ID#</u>	<u>Latitude</u>	<u>Longitude</u>
UNNAMED-304029085385502	8593	30°40'29.857"N	85°38'55.702"W

Field Parameters

Discharge Summary:

Not measured

Spring Magnitude:

Unknown

3/18/2004

Date

206

Specific Conductance (uS/cm)

7.1

pH (su)

7.09

Dissolved O₂ (mg/L)

23.9

Temperature (°C)

Description

This site includes several small sand boils. The banks of the seep area and run are heavily vegetated and show little erosion. The spring run enters Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



Spring Name

UNNAMED-304029085385503

NWF ID#

8594

Latitude

30°40'29.845"N

Longitude

85°38'55.041"W

Field Parameters**Discharge Summary:**

3/18/2004

1 gpm

Spring Magnitude:

Sixth

3/18/2004

Date

205

Specific Conductance (uS/cm)

8.2

pH (su)

5.62

Dissolved O₂ (mg/L)

24.6

Temperature (°C)**Description**

This spring emanates from a broad seepage area with several sand boils located in the spring run. The banks of the seep area and run are heavily vegetated and show little erosion. The spring run enters Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



Spring Name

UNNAMED-304027085385501

NWF ID#

8595

Latitude

30°40'27.521"N

Longitude

85°38'55.697"W

Field Parameters**Discharge Summary:**

3/18/2004

0.9 gpm

Spring Magnitude:

Seventh

3/18/2004

223

7.0

4.81

20.5

Date**Specific Conductance (uS/cm)****pH (su)****Dissolved O₂ (mg/L)****Temperature (°C)****Description**

This unnamed seepage discharges from a handful of small seeps and sand boils. The spring run enters Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



Spring Name

UNNAMED-304027085385502

NWF ID#

8596

Latitude

30°40'27.174"N

Longitude

85°38'55.34"W

Field Parameters**Discharge Summary:**

Not measured

Spring Magnitude:

Unknown

3/18/2004

Date

212

Specific Conductance (uS/cm)

7.2

pH (su)

7.16

Dissolved O₂ (mg/L)

23.4

Temperature (°C)**Description**

This area of boils and seeps discharges from a six-foot wide pool through a short run to Holmes Creek. There are a handful of small sand boils churning away near the center of the pool. The banks of the spring pool and run are heavily vegetated and show little erosion. The spring run enters Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED-304029085385901	8597	30°40'29.51"N	85°38'59.335"W

<u>Field Parameters</u>	3/18/2004	Date
Discharge Summary:	191	Specific Conductance (uS/cm)
3/18/2004 2 gpm	6.5	pH (su)
Spring Magnitude: Sixth	1.33	Dissolved O₂ (mg/L)
	19.8	Temperature (°C)

Description

This large seepage area discharges through a short run to Holmes Creek. There are numerous small sand boils located amongst the seeps and in the spring run. Iron/sulfur bacteria are common on the water surface at this location. The banks of the spring pool and run are heavily vegetated and show little erosion. The spring run enters Holmes Creek approximately 1.6 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED-304029085385902	8598	30°40'29.192"N	85°38'59.893"W

<u>Field Parameters</u>	3/18/2004	Date
Discharge Summary:	215	Specific Conductance (uS/cm)
3/18/2004 2 gpm	7.2	pH (su)
Spring Magnitude: Sixth	4.26	Dissolved O₂ (mg/L)
	20.5	Temperature (°C)

Description

This spring seep consists of a large seepage area with a short run to Holmes Creek. There are numerous small sand boils located amongst the seeps and in the spring run. The banks of the spring pool and run are heavily vegetated and show little erosion. The spring run enters Holmes Creek approximately 1.5 miles downstream from the CR 267A bridge. This spring tends to be indistinguishable at times of high water.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED-304027085380101	8599	30°40'27.716"N	85°39'01.708"W

Field Parameters

Discharge Summary:

3/18/2004 3 gpm

Spring Magnitude: Sixth

3/18/2004

204

7.9

8.61

22.4

Date

Specific Conductance (uS/cm)

pH (su)

Dissolved O₂ (mg/L)

Temperature (°C)

Description

This site is a large seepage area with a short run to Holmes Creek. There are numerous small sand boils located amongst the seeps and in the spring run. The banks of the spring pool and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable at times of high water.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED-304025085391101	8600	30°40'25.027"N	85°39'11.103"W

Field Parameters

Discharge Summary:

Not measured

Spring Magnitude:

Unknown

3/18/2004

222

7.0

1.79

19.9

Date

Specific Conductance (uS/cm)

pH (su)

Dissolved O₂ (mg/L)

Temperature (°C)

Description

This spring consists of a wide shallow run about thirty feet in width that drains a shallow, swampy area of seeps and sand boil discharge. The banks of the run are heavily vegetated and show little erosion. The spring run enters Holmes Creek from the west approximately 1.9 miles downstream from the CR 276A bridge. This spring tends to be indistinguishable at times of high water.



<u>Spring Name</u>	<u>NWF ID#</u>	<u>Latitude</u>	<u>Longitude</u>
UNNAMED-304023085391001	8601	30°40'23.221"N	85°39'10.486"W

<u>Field Parameters</u>	<u>Date</u>
Discharge Summary:	3/18/2004
Not measured	238
Spring Magnitude:	7.4
Unknown	3.15
	19.7
	Specific Conductance (uS/cm)
	pH (su)
	Dissolved O₂ (mg/L)
	Temperature (°C)

Description

UNNAMED-304023085391001 Spring discharges from one large sand boil surrounded by several smaller ones. The spring run exits the pool and joins the run from UNNAMED-304025085391101 in a 25-foot wide pool.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED-304015085391701	8602	30°40'15.225"N	85°39'17.199"W

<u>Field Parameters</u>	3/18/2004	Date
Discharge Summary:	221	Specific Conductance (uS/cm)
Not measured	7.6	pH (su)
Spring Magnitude:	5.0	Dissolved O₂ (mg/L)
Unknown	20.2	Temperature (°C)

Description

This spring consists of a handful of sand boils discharging to a low swampy area. Flow from the spring splits into two runs draining into Holmes Creek. The spring run enters Holmes Creek from the east approximately 2.1 miles downstream from the CR 276A bridge. This spring is indistinguishable at times of high water.



Spring Name

BURNT SOCK SPRING

NWF ID#

8603

Latitude

30°40'01.138"N

Longitude

85°39'48.288"W

Field Parameters**Discharge Summary:**

11/19/2003 not flowing
8/16/2006 1.0 cfs

Spring Magnitude: Third

11/19/2003

220

7.2

0.11

19.9

Date**Specific Conductance (uS/cm)****pH (su)****Dissolved O₂ (mg/L)****Temperature (°C)****Description**

This spring is in the floodplain of Holmes Creek, water discharges from a seep area and sand boils in a limestone ravine. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. The run enters Holmes Creek from the west approximately two miles upstream from Cotton Landing. There are also a number of sand boils in the creek bottom around the mouth of the spring.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303956085394801	8604	30°39'55.861"N	85°39'47.716"W

Field Parameters	11/19/2003	Date
Discharge Summary:	224	Specific Conductance (uS/cm)
11/19/2003 7.00 cfs	7.3	pH (su)
Spring Magnitude: Third	0.92	Dissolved O₂ (mg/L)
	19.6	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek. Water discharges from a seep area and sand boils. There was no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. The run enters Holmes Creek from the east approximately 1.8 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304002085394901	8605	30°40'01.958"N	85°39'48.547"W

Field Parameters	11/19/2003	Date
Discharge Summary:	166	Specific Conductance (uS/cm)
11/19/2003 1.00 cfs	7.3	pH (su)
Spring Magnitude: Third	0.17	Dissolved O₂ (mg/L)
	18.6	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. The run enters Holmes Creek from the west approximately 1.8 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304002085395001	8606	30°40'01.856"N	85°39'49.947"W

Field Parameters	11/19/2003	Date
Discharge Summary:	230	Specific Conductance (uS/cm)
11/19/2003 0.004 cfs	7.3	pH (su)
Spring Magnitude: Sixth	0.26	Dissolved O₂ (mg/L)
	18.7	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. The run enters Holmes Creek from the west approximately 1.8 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303959085395301	8607	30°39'58.617"N	85°39'53.153"W

Field Parameters	11/19/2003	Date
Discharge Summary:	Not measured	Specific Conductance (uS/cm)
Not measured	Not measured	pH (su)
Spring Magnitude:	Not measured	Dissolved O₂ (mg/L)
Unknown	Not measured	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a relatively large seep area. There is no vent or surface boil. Discharge and water quality were not collected due to flow-through from Holmes Creek. The banks surrounding the seep and run are heavily vegetated and swampy and show little erosion. The run enters Holmes Creek from the west approximately 1.7 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name

UNNAMED-303953085400201

NWF ID#

8609

Latitude

30°39'53.34"N

Longitude

85°40'02.188"W

Field Parameters**Discharge Summary:**

11/19/2003 0; due to creek level

Spring Magnitude:

not flowing

11/19/2003

214

6.7

0.79

18.4

Date**Specific Conductance (uS/cm)****pH (su)****Dissolved O₂ (mg/L)****Temperature (°C)****Description**

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and swampy and show little erosion. The run enters Holmes Creek from the east approximately 1.5 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303950085400901	8611	30°39'50.253"N	85°40'09.179"W

Field Parameters	11/19/2003	Date
Discharge Summary:	220	Specific Conductance (uS/cm)
11/19/2003 0; due to creek level	6.3	pH (su)
Spring Magnitude: not flowing	1.39	Dissolved O₂ (mg/L)
	21.3	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a relatively large seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and swampy and show little erosion. The run enters Holmes Creek from the east approximately 1.3 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303949085401701	8613	30°39'49.365"N	85°40'16.666"W

Field Parameters	10/23/2003	Date
Discharge Summary:	226	Specific Conductance (uS/cm)
Not measured	7.6	pH (su)
Spring Magnitude:	4.54	Dissolved O₂ (mg/L)
Unknown	20.4	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a relatively large seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and swampy and show little erosion. The run enters Holmes Creek from the east approximately 1.3 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303956085401001	8614	30°39'55.769"N	85°40'10.069"W

Field Parameters	10/23/2003	Date
Discharge Summary:	220	Specific Conductance (uS/cm)
10/23/2003 2.06 cfs	7.6	pH (su)
Spring Magnitude: Third	4.84	Dissolved O₂ (mg/L)
	20.6	Temperature (°C)

Description

This spring is approximately 30 feet up the run, which enters Holmes Creek from the west. It is a small spring situated in the floodplain of Holmes Creek with the vent covered with silt and woody debris. Water collects in a pool with a diameter of approximately four feet and the maximum depth is 0.75 feet. No surface boil is visible. The banks surrounding the pool are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303946085401901	8615	30°39'46.226"N	85°40'19.243"W

Field Parameters	10/23/2003	Date
Discharge Summary:	227	Specific Conductance (uS/cm)
10/23/2003 0.54 cfs	7.6	pH (su)
Spring Magnitude: Fourth	4.64	Dissolved O₂ (mg/L)
	20.0	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, with discharge from a relatively large seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and swampy and show little erosion. The run enters Holmes Creek from the west approximately 0.9 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303941085401901	8616	30°39'40.765"N	85°40'18.75"W

Field Parameters	10/23/2003	Date
Discharge Summary:	226	Specific Conductance (uS/cm)
10/23/2003 0.54 cfs	7.3	pH (su)
Spring Magnitude: Fourth	4.63	Dissolved O₂ (mg/L)
	20.5	Temperature (°C)

Description

This unnamed spring has vents on both sides of Holmes Creek. The vent on the east side is approximately 50 feet up a run and the vent on the west side is approximately 20 feet up a run. It is a seep spring with two vents situated in the floodplain of Holmes Creek. There is one vent on each side of the Creek. Water collects in a pool around each vent with a diameter of approximately 12 feet for the east vent and ten feet for the west vent. The maximum depth is two feet for the east vent and 1.5 feet for the west vent. No surface boil is visible. The banks surrounding the pool are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303935085402901	8617	30°39'34.929"N	85°40'29.067"W

Field Parameters	10/23/2003	Date
Discharge Summary:	237	Specific Conductance (uS/cm)
10/23/2003 0.01 cfs	7.0	pH (su)
Spring Magnitude: Sixth	2.48	Dissolved O₂ (mg/L)
	18.3	Temperature (°C)

Description

This spring is approximately 120 feet up its spring run, which enters Holmes Creek from the west. It is a seep spring situated in the floodplain of Holmes Creek. Water collects in several small seep areas that run together before entering Holmes Creek. The approximate area in the collective seep heads is 200 square feet. No surface boil is visible. The banks surrounding the seep areas are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303940085404001	8618	30°39'39.569"N	85°40'40.001"W

Field Parameters	10/23/2003	Date
Discharge Summary:	171	Specific Conductance (uS/cm)
10/23/2003	2 gpm	pH (su)
Spring Magnitude:	Sixth	Dissolved O₂ (mg/L)
	5.42	Temperature (°C)
	19.3	

Description

This spring consists of spring boils in a small slough, seepage areas, and boils in Holmes Creek. It is situated in the floodplain of Holmes Creek. The spring discharge appears to be issuing from honeycombed limestone and seeping from limestone outcrops. Water collects in a small pool incised in the bank and flows immediately into Holmes Creek. The diameter of the spring pool is approximately six feet and the maximum depth is 0.5 feet. The banks surrounding the pool are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303938085404301	8619	30°39'37.885"N	85°40'43.209"W

Field Parameters	10/23/2003	Date
Discharge Summary:	225	Specific Conductance (uS/cm)
10/23/2003 0.05 cfs	6.4	pH (su)
Spring Magnitude: Fifth	5.89	Dissolved O₂ (mg/L)
	19.1	Temperature (°C)

Description

This unnamed spring is approximately 40 feet up the run, which enters Holmes Creek from the west. It is a seep spring situated in the floodplain of Holmes Creek. Water collects in a pool with a diameter of approximately eight feet and the maximum depth is 0.2 feet. No surface boil was visible. The banks surrounding the pool are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303913085411701	8620	30°39'13.26"N	85°41'16.511"W

Field Parameters	10/22/2003	Date
Discharge Summary:	255	Specific Conductance (uS/cm)
10/22/2003 2.1 gpm	6.9	pH (su)
Spring Magnitude: Sixth	4.35	Dissolved O₂ (mg/L)
	20.3	Temperature (°C)

Description

This spring is approximately 60 feet up the run, which enters Holmes Creek from the east. There are also many spring boils in Holmes Creek near the mouth of the run. It is a seep spring situated in the floodplain of Holmes Creek. Water collects in a pool with a diameter of approximately ten feet with a maximum depth of one foot. No surface boil is visible but there are many small boils near the mouth of the run into Holmes Creek. The banks surrounding the pool are heavily vegetated and show little erosion. A weir used to estimate discharge from the smaller seeps and springs can be seen in the photograph below.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
UNNAMED - 303440085502101	8625	30°34'40.44"N	85°50'21.36"W

<u>Field Parameters</u>	4/6/2004	Date
Discharge Summary:	193	Specific Conductance (uS/cm)
Not measured	8.2	pH (su)
Spring Magnitude:	0.51	Dissolved O₂ (mg/L)
Unknown	20.5	Temperature (°C)

Description

This small unnamed spring is located in the Ibis Spring run adjacent to Holmes Creek. The surface boil is visible under low water levels. This location receives significant flow-through from the creek.



<u>Spring Name</u>	NWF ID#	Latitude	Longitude
IBIS SPRING	8626	30°34'41.5"N	85°50'16.5"W

<u>Field Parameters</u>	4/6/2004	Date
Discharge Summary:	176	Specific Conductance (uS/cm)
Not measured	8.0	pH (su)
Spring Magnitude:	1.27	Dissolved O₂ (mg/L)
Unknown	19.6	Temperature (°C)

Description

Ibis Spring is located off of a flow-through slough of Holmes Creek up a short run of about 100 feet. The spring discharges from a vent obscured by fallen silt-covered woody debris. Under low water levels for Holmes Creek, the spring forms a blue bowl about 60 feet across. At the time of visitation this out-of-the-way spring was serving as a rookery for a flock of ibis.



Spring Name	NWF ID#	Latitude	Longitude
SKIPPER SPRING	8627	30°34'31.92"N	85°50'36.90"W

Field Parameters	4/6/2004	Date
Discharge Summary:	361	Specific Conductance (uS/cm)
Not measured	7.7	pH (su)
Spring Magnitude:	1.91	Dissolved O₂ (mg/L)
Unknown	19.6	Temperature (°C)

Description

This spring is in the floodplain of Holmes Creek. Water discharges from a large, diffuse area of the bottom of the spring pool, which is approximately 150 feet in diameter. There is no discernable vent or surface boil. There is an old dock on the north side of the pool. The banks surrounding the pool are heavily vegetated and swampy and show little erosion. The run merges with several secondary channels of Holmes Creek before it enters Holmes Creek proper from the west approximately 0.4 miles upstream from Millers Ferry Landing.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303934085403401	8683	30°39'34.000"N	85°40'34.222"W

Field Parameters	10/22/2003	Date
Discharge Summary:	226	Specific Conductance (uS/cm)
10/22/2003 2 gpm	7.1	pH (su)
Spring Magnitude: Sixth	2.87	Dissolved O₂ (mg/L)
	20.2	Temperature (°C)

Description

This unnamed spring is approximately 60 feet up the run, which enters Holmes Creek from the west. The spring is situated in the floodplain of Holmes Creek. The vent is beneath a shelf of limestone. The diameter of the spring pool is approximately eight feet and the maximum depth is 2.5 feet. No surface boil is visible. The banks surrounding the pool are heavily vegetated and show little erosion.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303942085402401	8684	30°39'41.785"N	85°40'24.323"W

Field Parameters	10/22/2003	Date
Discharge Summary:	224	Specific Conductance (uS/cm)
10/22/2003 0.22 cfs	7.3	pH (su)
Spring Magnitude: Fifth	4.84	Dissolved O₂ (mg/L)
	21.1	Temperature (°C)

Description

This spring consists of a large area of seeps and sand boils discharging to a maze of braided spring runs connecting individual pools. The largest of the vents are typically two feet deep and six feet across. The surrounding floodplain is densely overgrown and muddy.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303938085401801	8685	30°39'37.75"N	85°40'17.844"W

Field Parameters	10/22/2003	Date
Discharge Summary:	213	Specific Conductance (uS/cm)
10/22/2003 3 gpm	7.3	pH (su)
Spring Magnitude: Sixth	6.01	Dissolved O₂ (mg/L)
	21.8	Temperature (°C)

Description

This spring is approximately 80 feet up a run which enters Holmes Creek from the west. The spring is situated in the floodplain of Holmes Creek where it discharges from a series of small seeps and sand boils.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303939085401901	8686	30°39'39.227"N	85°40'18.791"W

Field Parameters	10/22/2003	Date
Discharge Summary:	222	Specific Conductance (uS/cm)
10/22/2003 3 gpm	7.5	pH (su)
Spring Magnitude: Sixth	4.99	Dissolved O₂ (mg/L)
	21.3	Temperature (°C)

Description

This unnamed spring is approximately 70 feet up its run, which enters Holmes Creek from the west. The spring is situated in the floodplain of Holmes Creek where it discharges from a series of small seeps and sand boils.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303937085404001	8687	30°39'36.531"N	85°40'39.58"W

Field Parameters	10/23/2003	Date
Discharge Summary:	209	Specific Conductance (uS/cm)
10/23/2003 0.05 cfs	7.1	pH (su)
Spring Magnitude: Fifth	6.41	Dissolved O₂ (mg/L)
	20.3	Temperature (°C)

Description

This small unnamed spring discharges into a slough of Holmes Creek about 200 feet from the main channel. The spring flows from a number of seeps and sand boils located in the low and swampy floodplain.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303937085402901	8689	30°39'36.507"N	85°40'28.619"W

Field Parameters	10/23/2003	Date
Discharge Summary:	237	Specific Conductance (uS/cm)
10/23/2003 3.8 gpm	7.0	pH (su)
Spring Magnitude: Sixth	2.48	Dissolved O₂ (mg/L)
	18.3	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek. Water discharges from a relatively large seep area and enters the Creek via several runs. There is no vent or surface boil. The banks surrounding the seep and runs are heavily vegetated, swampy and show little erosion. The runs enter Holmes Creek from the west approximately 0.6 miles upstream from Cotton Landing. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303939085402501	8690	30°39'39.15"N	85°40'24.569"W

Field Parameters	10/23/2003	Date
Discharge Summary:	224	Specific Conductance (uS/cm)
10/23/2003 0.01 cfs	7.2	pH (su)
Spring Magnitude: Sixth	4.47	Dissolved O₂ (mg/L)
	20.4	Temperature (°C)

Description

This spring consists of a single pool collecting the flow from numerous seeps and small sand boils in the floodplain of Holmes Creek. A small run exits the pool and flows about 100 feet to the sandy banks of the creek.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303941085401701	8692	30°39'41.155"N	85°40'17.057"W

Field Parameters	10/23/2003	Date
Discharge Summary:	150	Specific Conductance (uS/cm)
10/23/2003 0.77 cfs	7.5	pH (su)
Spring Magnitude: Fourth	5.01	Dissolved O₂ (mg/L)
	21.0	Temperature (°C)

Description

This spring discharges from two sets of connected seeps and sand boils that splits into several runs to Holmes Creek. The maximum depth in the pools is approximately three feet.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303949085401702	8695	30°39'49.366"N	85°40'17.439"W

Field Parameters	10/23/2003	Date
Discharge Summary:	224	Specific Conductance (uS/cm)
10/23/2003 0.9 gpm	7.5	pH (su)
Spring Magnitude: Seventh	3.79	Dissolved O₂ (mg/L)
	19.9	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a seep area. There is no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-303955085401001	8696	30°39'54.574"N	85°40'10.216"W

Field Parameters	10/23/2003	Date
Discharge Summary:	206	Specific Conductance (uS/cm)
10/23/2003 0.9 gpm	7.5	pH (su)
Spring Magnitude: Seventh	5.37	Dissolved O₂ (mg/L)
	20.4	Temperature (°C)

Description

This unnamed spring is in the floodplain of Holmes Creek, water discharges from a seep area. There was no vent or surface boil. The banks surrounding the seep and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304025085390401	8904	30°40'25.254"N	85°39'04.633"W

Field Parameters	3/18/2004	Date
Discharge Summary:	227	Specific Conductance (uS/cm)
3/18/2004 4 gpm	7.0	pH (su)
Spring Magnitude: Sixth	2.65	Dissolved O₂ (mg/L)
	20.6	Temperature (°C)

Description

This spring consists of a group of small sand boils discharging to a round three foot wide pool in the floodplain of Holmes Creek. The banks surrounding the seep and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304025085390402	8905	30°40'25.541"N	85°39'04.601"W

Field Parameters	3/18/2004	Date
Discharge Summary:	215	Specific Conductance (uS/cm)
Not measured	7.0	pH (su)
Spring Magnitude:	4.55	Dissolved O₂ (mg/L)
Unknown	21.7	Temperature (°C)

Description

This spring consists of a group of small sand boils discharging to a shallow pool in the floodplain of Holmes Creek. The banks surrounding the seep and run are heavily vegetated and show little erosion. This spring tends to be indistinguishable at times of high water.



Spring Name	NWF ID#	Latitude	Longitude
UNNAMED-304027085390301	8906	30°40'27.716"N	85°39'03.537"W

Field Parameters	3/18/2004	Date
Discharge Summary:	208	Specific Conductance (uS/cm)
3/18/2004 1.0 cfs	7.3	pH (su)
Spring Magnitude: Third	4.53	Dissolved O₂ (mg/L)
	21.1	Temperature (°C)

Description

This spring consists of relatively large sand boils and seeps flowing to a central pool, which then splits into two runs flowing to Holmes Creek. The floodplain here is very low and is frequently inundated by Holmes Creek.



Table B-1. Springs of Holmes Creek

NWF ID	SITE ID	SPRING NAME	LATITUDE (N)	LONGITUDE (W)
8087	303929085410401	CYPRESS SPRING	303929.160	854103.840
8088	303855085413701	BECKTON SPRING	303854.948	854137.045
8089	303618085455501	HIGHTOWER SPRING	303618.305	854555.212
8090	304006085392001	MULLET SPRING	304006.334	853919.944
8300	303904085411401	SHELLCRACKER SPRING	303904.921	854114.383
8301	303829085413701	CLEMMONS SPRING	303829.400	854137.500
8302	303647085440201	JACK PAUL HEADSPRING	303646.782	854401.842
8303	303633085453101	BRUNSON LANDING SPRING	303633.120	854530.900
8365	303551085503201	GALLAWAY SPRING	303551.200	855032.200
8366	303931085412601	PINEYWOOD SPRING	303930.795	854126.351
8428	303428085502601	MILLERS FERRY SPRING	303428.100	855025.500
8588	304055085384601	BURNT OUT SPRING	304055.320	853845.660
8589	304042085384501	UNNAMED-304042085384501	304042.524	853845.939
8590	304032085385301	UNNAMED-304030085385301	304030.618	853853.827
8591	304029085385401	UNNAMED-304029085385401	304029.637	853854.370
8592	304029085385501	UNNAMED-304029085385501	304029.950	853855.786
8593	304029085385502	UNNAMED-304029085385502	304029.857	853855.702
8594	304029085385503	UNNAMED-304029085385503	304029.845	853855.041
8595	304027085385501	UNNAMED-304027085385501	304027.521	853855.697
8596	304027085385502	UNNAMED-304027085385502	304027.174	853855.340
8597	304029085385901	UNNAMED-304029085385901	304029.510	853859.335
8598	304029085385902	UNNAMED-304029085385902	304029.192	853859.893
8599	304027085390101	UNNAMED-304027085380101	304027.716	853901.708
8600	304025085391101	UNNAMED-304025085391101	304025.027	853911.103
8601	304023085391001	UNNAMED-304023085391001	304023.221	853910.486
8602	304015085391701	UNNAMED-304015085391701	304015.225	853917.199
8603	304001085394801	BURNT SOCK SPRING	304001.138	853948.288
8604	303956085394801	UNNAMED-303956085394801	303955.861	853947.716
8605	304002085394901	UNNAMED-304002085394901	304001.958	853948.547
8606	304002085395001	UNNAMED-304002085395001	304001.856	853949.947
8607	303959085395301	UNNAMED-303959085395301	303958.617	853953.153
8609	303953085400201	UNNAMED-303953085400201	303953.340	854002.188
8611	303950085400901	UNNAMED-303950085400901	303950.253	854009.179
8613	303949085401701	UNNAMED-303949085401701	303949.365	854016.666
8614	303956085401001	UNNAMED-303956085401001	303955.769	854010.069
8615	303946085401901	UNNAMED-303946085401901	303946.226	854019.243
8616	303941085401901	UNNAMED-303941085401901	303940.765	854018.750
8617	303935085402901	UNNAMED-303935085402901	303934.929	854029.067
8618	303940085404001	UNNAMED-303940085404001	303939.569	854040.001
8619	303938085404301	UNNAMED-303938085404301	303937.885	854043.209
8620	303913085411701	UNNAMED-303913085411701	303913.260	854116.511
8625	303440085502101	UNNAMED-303440085502101	303440.440	855021.360
8626	303441085501601	IBIS SPRING	303441.500	855016.500
8627	303432085503701	SKIPPER SPRING	303431.920	855036.900
8683	303934085403401	UNNAMED-303934085403401	303934.000	854034.222
8684	303942085402401	UNNAMED-303942085402401	303941.785	854024.323
8685	303938085401801	UNNAMED-303938085401801	303937.750	854017.844
8686	303939085401901	UNNAMED-303939085401901	303939.227	854018.791
8687	303937085404001	UNNAMED-303937085404001	303936.531	854039.580
8689	303937085402901	UNNAMED-303937085402901	303936.507	854028.619
8690	303939085402501	UNNAMED-303939085402501	303939.150	854024.569
8692	303941085401701	UNNAMED-303941085401701	303941.155	854017.057
8695	303949085401702	UNNAMED-303949085401702	303949.366	854017.439
8696	303955085401001	UNNAMED-303955085401001	303954.574	854010.216
8904	304025085390401	UNNAMED-304025085390401	304025.254	853904.633
8905	304025085390402	UNNAMED-304025085390402	304025.541	853904.601
8906	304027085390301	UNNAMED-304027085390301	304027.716	853903.537
Coordinates are in DDMMSS.SSS format (Datum WGS84)				