ECONFINA CREEK SPRING INVENTORY
WASHINGTON AND BAY COUNTIES, FL

Water Resources Special Report 04-02

Prepared by:

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The Northwest Florida Water Management District

July 2004

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
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INTRODUCTION

Purpose and Scope

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 as part of the program. When the 2003 Florida Legislature continued funding for a third 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 Econfina Creek in Washington and Bay counties.

Recreational information (Follman, www.tfn.net/springs) indicated to the District that there were a number of springs in the floodplain and surface water drainage basin 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 Econfina Creek Basin in Washington and Bay counties, 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 GPS location information as well as performing discharge measurements for springs that appear to be second magnitude. This report is the task deliverable.

Area of Investigation

Econfina Creek originates in Jackson County and flows through Bay County, Washington County and back into Bay County where it enters Deer Point Lake. The Deer Point Lake surface-water drainage basin covers approximately 422 square miles (~270,000 acres) in Bay, Calhoun, Jackson and Washington counties (**Figure 1**). Econfina Creek itself has a surface water basin covering 275 square miles (~176,000 acres). The study area for this spring was focused on middle Econfina Creek. Previous work done by the District determined a ground water contribution area for middle Econfina Creek (**Figure 2**) of 149 square miles (~95,360 acres) (Richards 1997). This work illustrated the importance of the Sand Hill Lakes region in providing recharge to the Econfina Creek springs including one of the District's five first magnitude springs — the Gainer Springs Group.

Hydrologic Setting

Econfina Creek flows through the Dougherty Karst Plain District (**Figure 3**) which, in Florida, encompasses the northern portions of Bay and Calhoun counties, portions of Walton County, all of Jackson County and most of Washington and Holmes counties (Pratt et al. 1996). 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 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 District.

The Floridan Aquifer is the primary source of water for consumptive use (i.e. public supply, domestic supply, irrigation, etc.) in this area.

In eastern Washington County and northern Bay County, the Floridan Aquifer is comprised of the Chattahoochee Formation, the Marianna/Bridgeboro Limestone and the Ocala Limestone (Green et al. 2002). In May 1996 the District drilled a monitor well east of Porter Pond, near the northern extent of the study area. According to lithologic logs created by FGS from well cuttings generated from the well installation, the topmost member of the Floridan Aquifer, the Chattahoochee Formation, was encountered at an elevation of approximately 25 feet above mean sea level. The Floridan Aquifer thickens from 500 feet in southern Jackson County to around 700 feet in north-central Bay County (Pratt, et al., 1996). It has a confining unit of variable thickness composed of the unconsolidated clastic sediments of the Citronelle Formation unconformably overlying the Alum Bluff Group (Green et al. 2002). This confining unit is frequently breached by sinks and paleosinks. Also contained within the Intermediate System may be thin, confined water bearing zones. The area where the Intermediate System is thin or absent corresponds to the area where springs are most heavily concentrated – in or near the channel for Econfina Creek. The contact between the Intermediate System and the limestone members comprising the Floridan Aquifer is visible at several locations along the Creek channel. The bluff adjacent to Gainer Spring #2 is an excellent location to view the contact – the spring discharges from the aquifer just below the contact. The Floridan Aquifer potentiometric surface elevation drops from approximately 50 feet above sea level near the northern most springs to approximately 30 feet above sea level near the southern springs (Richards 1999). The Econfina Springs all fall within a short 4.75-mile segment of Middle Econfina Creek. This segment corresponds to the intersection of the Floridan Aquifer by Econfina Creek. Above and below the springs' area the Creek channel is located within the clastic sediments of the Intermediate System. It is logical to expect a ground water contribution to Econfina Creek as the Floridan potentiometric surface elevation is fairly commensurate with topographic elevations near the Econfina Creek Springs area.

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. 1998). The 1996 potentiometric surface map contains the most data points in the Econfina Creek area. A ground water contribution zone for the Econfina Creek springs interpreted from this potentiometric surface map (**Figure 4**) has an area of approximately 184 square miles (~117,800 acres) but is subject to change under different hydrologic conditions. The ground water contribution zone for the Econfina Springs corresponds well to the Middle Econfina Creek ground water contribution zone created by Richards (1997). It is bounded by ground water contribution zones for the Chipola River to the east and Holmes Creek to the north and west (Richards 1997).

Precipitation and Creek Stage

Precipitation in the Econfina Creek basin is measured at the Northwest Florida Water Management District Field Office. Measurements are recorded at ten minute intervals and daily totals were calculated for the purpose of this study. The stage of Econfina Creek is measured at several locations along its course. For the purpose of this study, the stage at County Road 388 is used due to its location downstream of the Econfina Springs discharge. Stage is recorded at ten minute intervals as well but daily average stage was calculated for this work. During the period of the spring inventory along Econfina Creek, precipitation and stage were

neither extremely high nor extremely low. The "typical" conditions neither aided nor hindered efforts to locate springs. **Figure 5** illustrates the relationship between precipitation and stage in the basin.

On May 26, 2004 District staff measured a creek flow of 61.4 cfs upstream of Devils Hole near base flow conditions for the study period. The difference between that measurement and the calculated average discharge on May 26 for Econfina Creek at CR388 (450 cfs) is 389 cfs. The total of the ground water discharge measurements performed at springs in the Econfina basin for this study was 320 cfs. Therefore, under base flow conditions, an estimated 82 percent of the Econfina Creek flow between Devils Hole and CR388 originates from springs visited for this inventory. The remaining contribution most likely comes from small surface water drainage systems or other ground water sources such as seep springs, diffuse flow into the creek channel, or other springs not identified under current hydrologic conditions.

ECONFINA CREEK SPRINGS

Discharge

A total of 11 springs or spring groups, comprised of more than 36 vents, were identified in the Econfina Creek basin. These springs were concentrated in the area 0.75 miles north of Walsingham Bridge to 0.5 miles south of Highway 20 (**Figure 6**). Some areas that were historically listed as "potential" springs (Follman, www.tfn.net/springs) were investigated and found to be simply turbulent upwelling of surface water caused by the creek channel geometry. Some springs, such as Deep Spring in Bay County were determined to be Surficial Aquifer discharge points instead of Floridan Aquifer springs and were not included in the inventory.

Springs in the Econfina 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 as well as those that discharge laterally at or near the surface level of the creek. The latter springs 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 numerous areas of ground water discharge in the channel of Econfina Creek. Some of the areas can be detected by a dilution of the tannic surface water near areas of limestone outcrops but others contribute water imperceptibly.

There are several relatively large, named springs along Econfina Creek that contribute to the flow. The District made site visits to these springs and made discharge and field water quality measurements where possible. The discharge measurements are presented in **Table 1**.

Table 1 – Spring Discharge Measurements.

Spring	Date	Discharge (cfs)
Gainer Springs Group (composite)	4/7/2004	177
Glowing Spring	12/23/2003	34.44
Devils Hole	5/26/2004	32.15
Williford Springs Group (composite)	11/25/2003	28.64
Sylvan Springs Group (composite)	11/19/2003	16.61
Econfina Blue Springs Group (composite)	11/19/2003	7.08
Strickland Springs Group (composite)	12/3/2003	5.10

Pitts Spring	12/03/2003	5.03
Fenceline Spring	3/09/2004	4.02
Tupelo Spring	5/26/2004	4.00
Palm Springs Group	5/26/2004	2.38
Bathtub Spring	12/23/2003	1.57
Barking Spring	12/30/2003	0.74
Bluff Spring	3/09/2004	0.85

The system has one first magnitude spring group (>100 cfs discharge) which is the Gainer Springs Group. Four springs or spring groups are currently classified as second magnitude (>10 to 100 cfs). Six springs or spring groups are classed as third magnitude (>1 to 10 cfs). The Barking Spring and Bluff Spring discharge are such that they are considered to be fourth-magnitude (>0.22 to 1 cfs). Future discharge measurements under other flow conditions may have some effect on the ratings of individual springs.

The point discharge measurements conducted for the Econfina spring inventory are displayed in relation to the quarterly discharge measurements collected for the Gainer Springs Group in **Figure 7**.

Water Quality

As part of the spring inventory process, field water quality measurements were made during site visits where possible. Measurements were made for water temperature (degrees C), dissolved oxygen (mg/L), pH (standard units), and specific conductivity (umhos/cm). **Table 2** presents the results of these measurements.

Table 2 – Field Water Quality Measurements of Springs in Econfina Creek Basin.

Spring Name	Date Sampled	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μmhos/cm)	Temperature (°C)
BARKING SPRING	12/30/03	3.42	8.23	122	20.7
BATHTUB SPRING	12/3/03	2.31	7.64	127	20.83
BLUFF SPRING	3/9/04	1.74	8.01	134	21.33
DEVILS HOLE	5/26/04	2.66	7.3	117	21.04
ECONFINA BLUE SPRING #1	11/19/03	3.73	8.13	114	20.67
ECONFINA BLUE SPRING #2	11/19/03	2.3	8	137	20.83
ECONFINA BLUE SPRING #3	11/19/03	2.77	8.07	128	20.55
FENCELINE SPRING	3/9/04	1.56	8.19	130	21.34
GAINER SPRINGS #1A	1/22/04	1.62	8.25	128	21.37
GAINER SPRINGS #1B	1/22/04	3.55	8.52	127	21.27
GAINER SPRINGS #1C	4/5/04	2.43	7.99	139	21.04
GAINER SPRINGS #1D	1/22/04	1.7	8.21	127	21.36
GAINER SPRINGS #1E	1/22/04	2.86	8.38	126	21.3
GAINER SPRINGS #1F	1/22/04	1.94	8.23	125	21.27
GAINER SPRINGS #1G	1/22/04	2.38	8.27	120	21.35
GAINER SPRINGS #1H	1/22/04	2.77	8.28	119	21.41
GAINER SPRINGS #1I	1/22/04	2.25	8.22	118	21.39

GAINER SPRINGS #2	4/5/04	3.04	7.81	116	21.44
GAINER SPRINGS #3	4/5/04	2.59	8.09	123	21.42
GAINER SPRINGS #4	1/5/04	2.43	8.14	118	21.41
GAINER SPRINGS #5	1/5/04	3.26	8.07	121	21.38
GLOWING SPRING	12/3/03	1.86	7.45	122	20.76
PALM SPRING	5/26/04	1.95	7.52	125	20.7
PITTS SPRING	5/24/04	1.56	7.75	132	21.35
STRICKLAND SPRING #1	12/3/03	1.6	7.66	124	21.5
STRICKLAND SPRING #2	12/3/03	3.24	7.53	127	21.31
SYLVAN SPRINGS #1	11/19/03	1.7	8.12	128	21.37
SYLVAN SPRINGS #2	11/19/03	2.31	8.14	127	21.35
TUPELO SPRING	5/26/04	2.64	7.5	128	20.6
WILLIFORD RUN #2	11/25/03	1.6	7.7	134	21.44
WILLIFORD RUN #3	11/25/03	1.64	7.64	134	21.42
WILLIFORD RUN #4	11/25/03	1.35	7.7	135	21.45
WILLIFORD RUN #5	11/25/03	0.77	7.67	134	21.45
WILLIFORD RUN #6	11/25/03	0.77	7.68	134	21.45
WILLIFORD RUN #7	11/25/03	1.11	7.83	133	21.42
WILLIFORD RUN SPRING #1	11/25/03	2.14	7.72	137	21.45
WILLIFORD SPRING	11/25/03	0.77	7.62	135	21.45

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 20.79 degrees C (n=4120, mean=20.77, stdev=0.11). The median temperature of the Econfina Creek springs of 21.35 degrees C (n=34, mean=21.21, stdev=0.30), although slightly elevated, compares well with this typical Floridan Aquifer value. Springs located in close proximity appear to have similar temperature values.

A surface water body with a dissolved oxygen (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 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 median DO value of 2.05 mg/L for the Econfina Creek Springs (n=34, mean=2.13, stdev=0.79) is higher than would be normally expected in the Floridan Aquifer.

The 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 naturally acidic rain water raises the pH of the 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 Econfina Creek springs is 8.01 standard units (n=34, mean=7.92, stdev=0.32).

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 umhos/cm. The median specific conductivity value for Floridan Aquifer wells recently sampled

in this area is 256 umhos/cm (n=30, mean=333, stdev=223). The median specific conductivity of the Econfina Creek springs is 127 umhos/cm (n=34, mean=127.26, stdev=6.26).

The elevated DO values and lower specific conductivity values are probably the result of an influx of lower residence time, less mineralized and more acidic ground water into the Floridan Aquifer before it discharges from the springs. Because of this high local recharge and the significant surface water – ground water interaction within this highly karstic environment, the springs along Econfina Creek are particularly vulnerable to proximate land use activities. There is no doubt, however, that these springs discharge Floridan Aquifer water.

CONCLUSION

- *Under moderate-flow conditions, ground water makes up the majority of Econfina Creek's discharge and the quality of water discharged from the Econfina Creek springs is predominantly determined by the quality of ground water in the Floridan Aquifer.*

- *Under high-flow conditions, Econfina Creek contains more surface water and the ground water component is diluted.*

- *The ground water contribution zone in for the Econfina Creek springs is large and encompasses a significant portion of the Creek's surface water basin. The Econfina Creek discharge increases greatly as it passes through the springs' area.*

- *Water quality in the Floridan Aquifer and the springs' discharge is vulnerable to land use activities in the contribution zone. The springs are particularly vulnerable to those activities proximal to them.*

- *There are at least 39 individual spring vents located in the middle Econfina Creek basin. There may be more springs that could be distinguished under lower stage conditions.*

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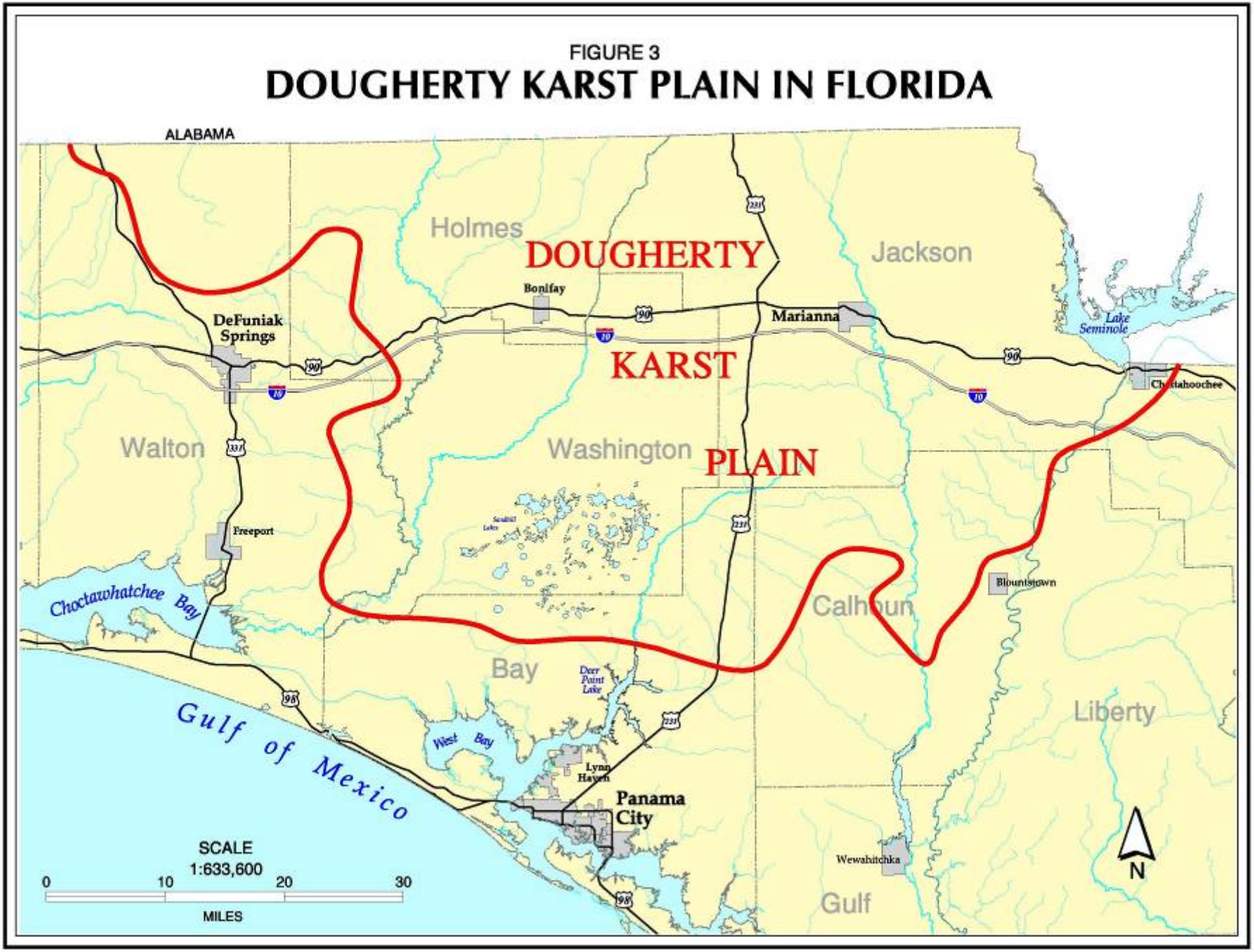
APPENDIX A
FIGURES


FIGURE 1
ECONFINA CREEK BASIN
Holmes
Jackson
Bonifay
Marianna
Washington
Sandhill Lakes
Econfina Creek
Bay
Calhoun
Deer Point Lake
N
West Bay
North Bay
Lynn Haven
Panama City
Gulf of Mexico
East Bay
Wewahitchka
Gulf
SCALE
1:380,160
0 5 10 15
MILES

FIGURE 3

DOUGHERTY KARST PLAIN IN FLORIDA



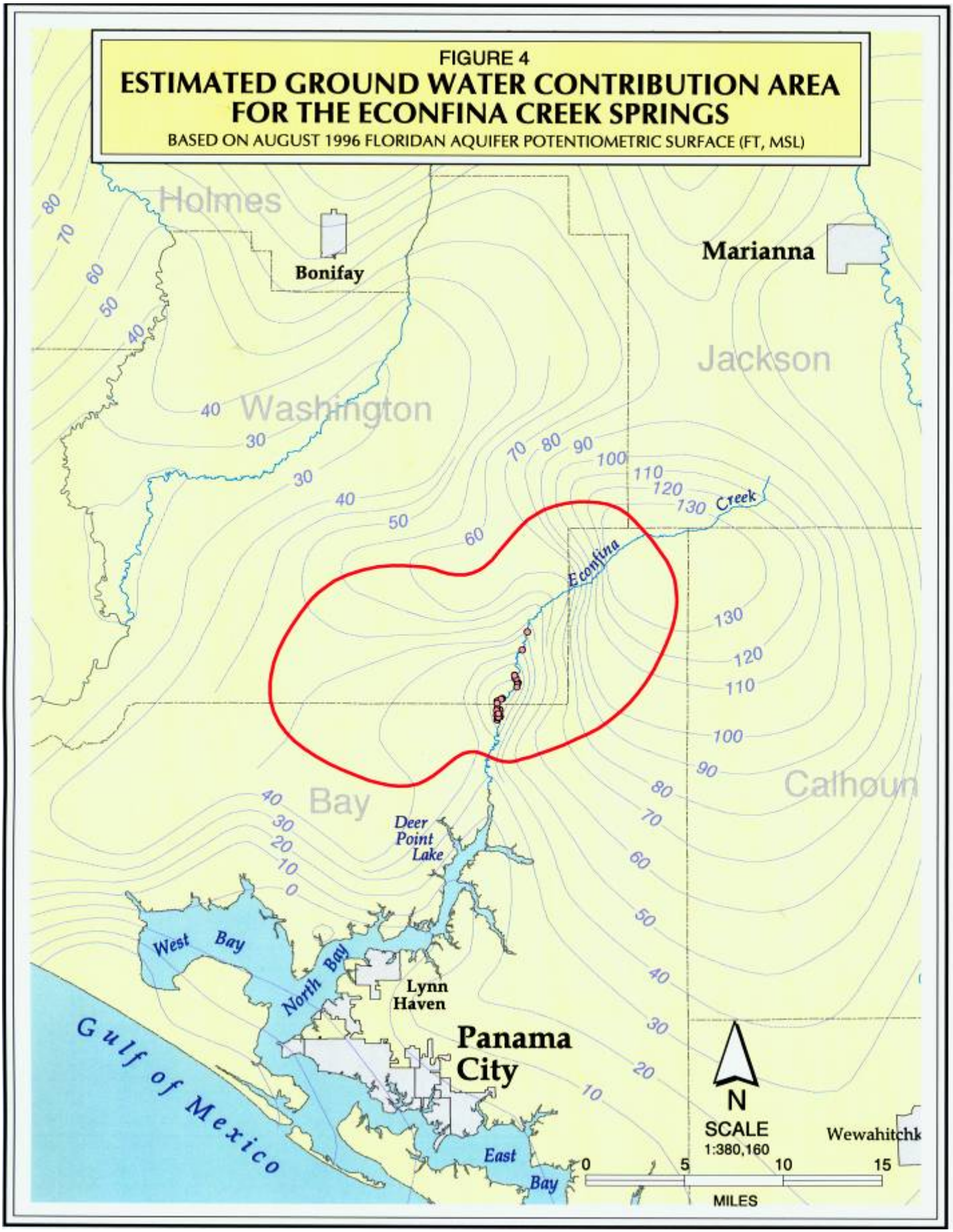
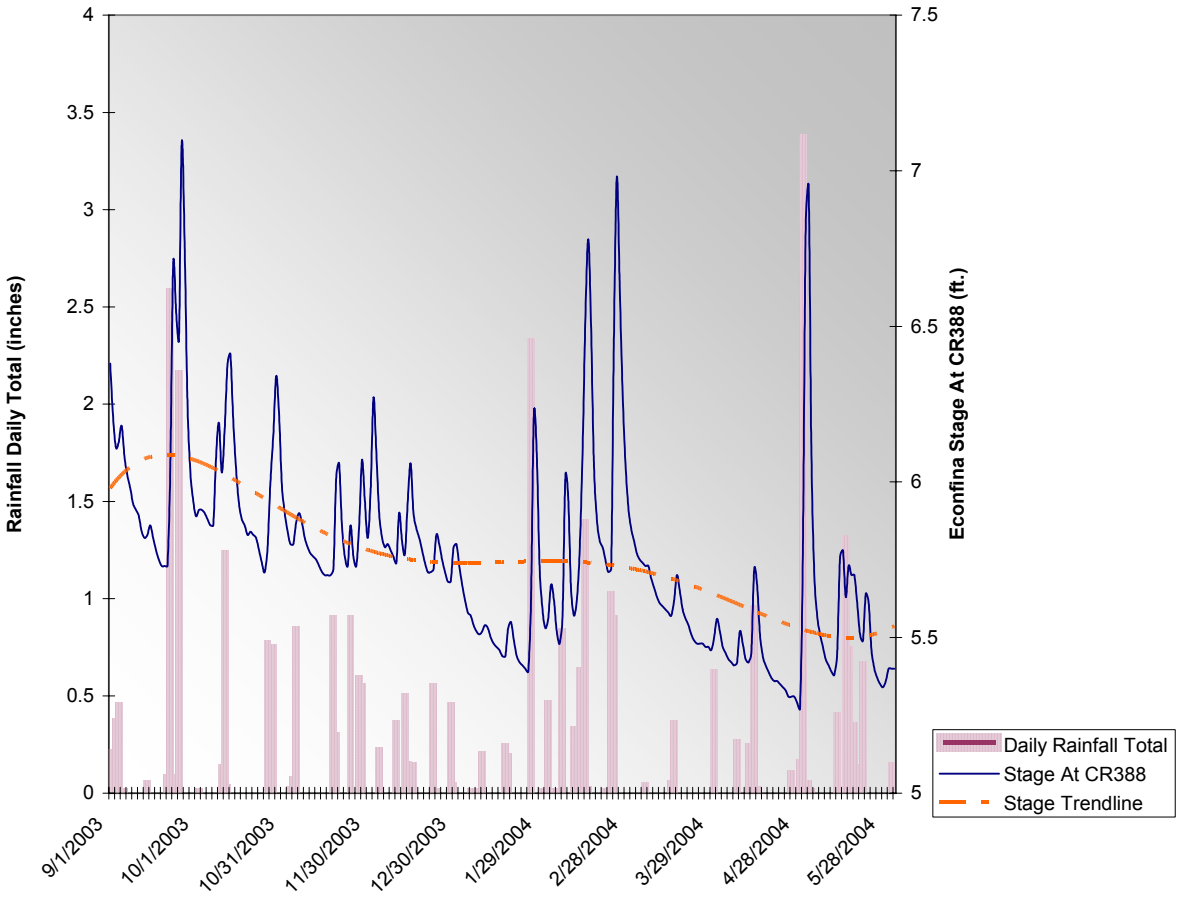


FIGURE 4
ESTIMATED GROUND WATER CONTRIBUTION AREA FOR THE ECONFINA CREEK SPRINGS
BASED ON AUGUST 1996 FLORIDAN AQUIFER POTENTIOMETRIC SURFACE (FT, MSL)
Holmes
Bonifay
Marianna
Jackson
Washington
Bay
Calhoun
Econfina Creek
Deer Point Lake
West Bay
North Bay
Lynn Haven
Panama City
East Bay
Gulf of Mexico
Wewahitchk
N
SCALE
1:380,160
0 5 10 15
MILES

Figure 5: NWFWMD Econfina Field Office Precipitation and Econfina Creek Stage (CR388).



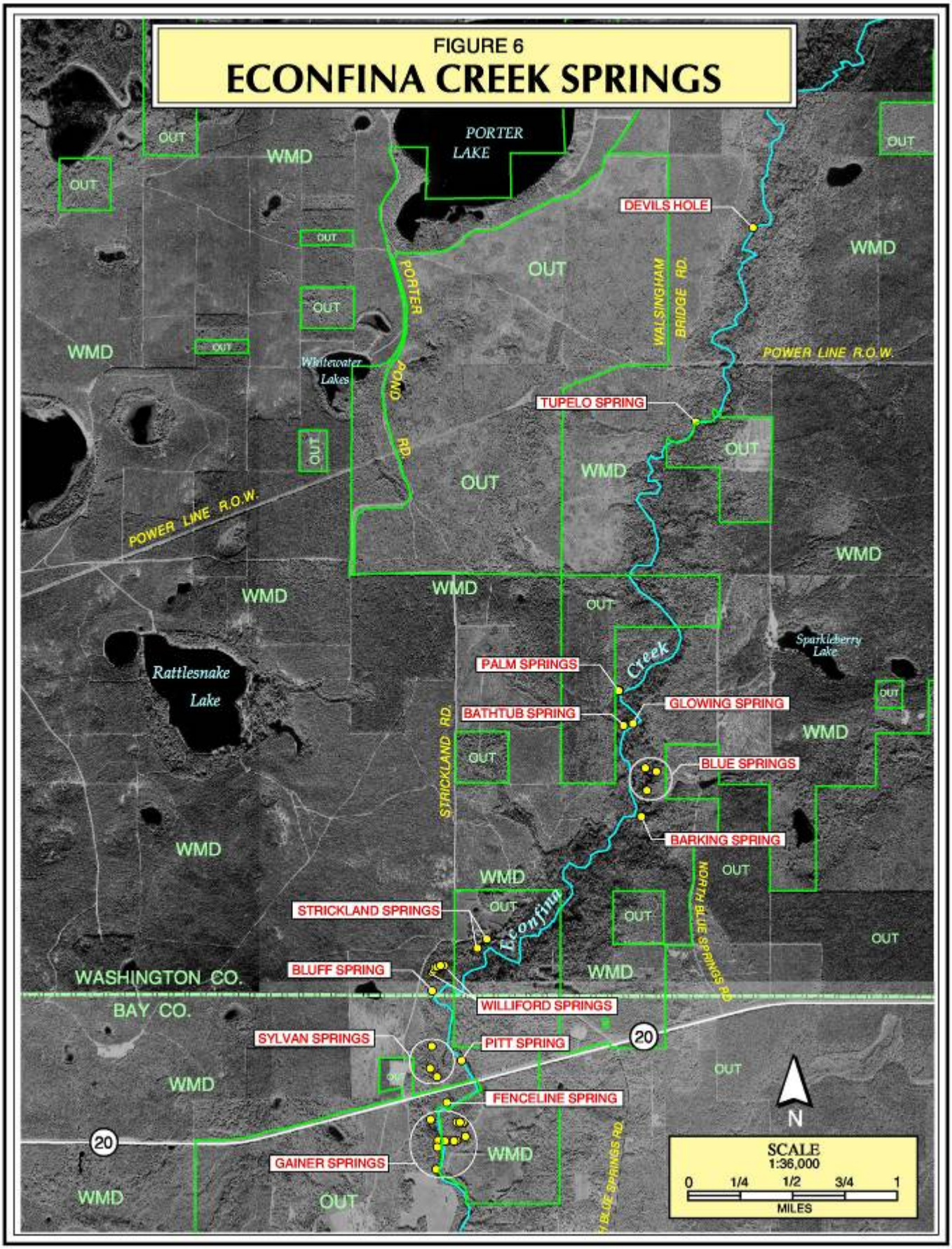
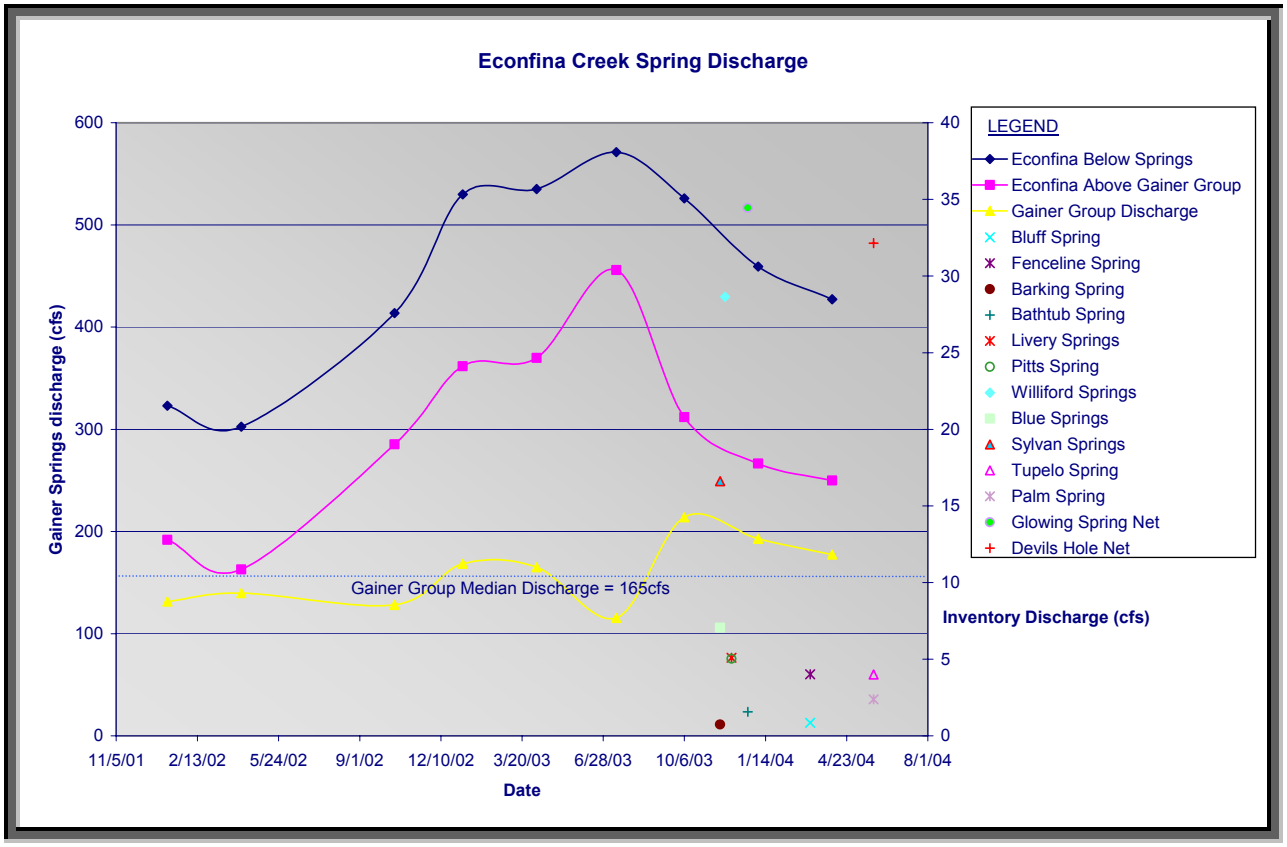


FIGURE 6
ECONFINA CREEK SPRINGS
PORTER LAKE
DEVILS HOLE
WALSINGHAM BRIDGE RD.
PORTER POND RD.
Whitewater Lakes
POWER LINE R.O.W.
TUPELO SPRING
POWER LINE R.O.W.
Rattlesnake Lake
Sparkleberry Lake
Econfina Creek
PALM SPRINGS
GLOWING SPRING
BATHTUB SPRING
STRICKLAND RD.
BLUE SPRINGS
BARKING SPRING
NORTH BLUE SPRINGS RD.
STRICKLAND SPRINGS
BLUFF SPRING
WILLIFORD SPRINGS
WASHINGTON CO.
BAY CO.
SYLVAN SPRINGS
PITT SPRING
FENCELINE SPRING
GAINER SPRINGS
BLUE SPRINGS RD.
OUT
WMD
20
N
SCALE
1:36,000
0 1/4 1/2 3/4 1
MILES

Figure 7: Econfina Creek Springs Discharge



APPENDIX B
SPRINGS

Table 3 – Springs of Econfina Creek

SPRING NAME	LATITUDE (ddmmss.sss)	LONGITUDE (ddmmss.sss)	DESCRIPTION
BARKING SPRING	302659.053	853153.862	This spring vent is located up a short run on the east side of the creek approximately three miles north of the Highway 20 bridge. Water is discharged laterally from cavities in a low (two-foot high) limestone outcrop. The spring pool is approximately 12 feet in diameter with a maximum depth of one foot. The spring is on Water Management District land.
BATHTUB SPRING	302721.857	853158.616	This spring vent is located up a short run on the west side of the creek approximately 3.4 miles north of the Highway 20 bridge. The vent contains branches and small logs. It discharges into a small pool approximately five feet in diameter with a maximum depth of three feet at the vent. The vent is on Water Management District land.
BLUFF SPRING	302616.091	853254.793	This spring vent is located at the head of a run on the west side of the creek approximately 0.78 miles north of the Highway 20 bridge. Ground water discharges laterally from beneath a 25-foot high limestone bluff. The vent is on Water Management District land.
DEVILS HOLE SPRING	302925.900	853119.400	This spring is located in the Econfina Creek watershed adjacent to Water Management District Land. The spring discharges from beneath a limestone ledge approximately 11 feet deep on the west side of the main channel of Econfina Creek approximately 0.9 miles above Walsingham Bridge. A significant boil is visible at normal stage levels.
ECONFINA BLUE SPRINGS			This spring group consists of three principal springs and numerous smaller vents and seeps. The group is located on Water Management District land.
ECONFINA BLUE SPRING #1	302710.210	853149.347	Three vents discharge laterally into a 40-foot diameter pool. The largest discharge is from a half-submerged cave beneath a six-foot high limestone bluff. The maximum depth at the vent is 3.3 feet but the pool is much deeper in places. There is a campsite and picnic area on the bluff next to the pool. A wide cement stairway leads down to the edge of the water.
ECONFINA BLUE SPRING #2	302711.160	853152.497	Five vents discharge laterally into a 34-foot diameter pool. Discharge emerges laterally from beneath a collapsing carbonate bluff approximately eight feet high. The maximum depth in the pool is approximately 3.3 feet.
ECONFINA BLUE SPRING #3	302705.547	853152.185	A collection of laterally-discharging vents and diffuse discharge directly enter the Econfina Blue Spring #3 run from beneath a four-foot high carbonate bluff.
FENCELINE SPRING	302548.155	853251.091	This spring vent is located in the Econfina Creek watershed. The entrance to the run is approximately 0.4 mile south of the Highway 20 bridge on the west side of the creek. The pool, at the head of a 75 foot run is approximately 30 feet in diameter. There is no central vent, rather a honeycomb area of bottom with a more diffuse discharge. The vent is on private land.

GAINER SPRINGS GROUP			This first magnitude spring is located in the Econfina Creek watershed. It is actually a collection of vents located along the middle portion of Econfina Creek just south of the Bay County-Washington County line.
GAINER SPRINGS #1A	302543.114	853246.107	The vent is in Gainer Springs #1 run approximately 0.29 mile from its confluence with Econfina Creek at the head of the run. A sizable, sandy vent is imbedded in a pool approximately six feet across in the bottom of the run. No surface boil is evident but there is a small plume of sediment moving in the pool. Maximum depth measured in the vent is four feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1B	302543.091	853247.340	The vent is in the bottom of Gainer Springs #1 run approximately 0.26 mile from its confluence with Econfina Creek. A 40 foot diameter pool is filled with sand and woody debris. This vent has no boil and the surrounding sediment is covered with algae. Maximum depth measured in the vent is 11 feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1C	302539.620	853245.830	The vent is in Gainer Springs #1 run approximately 0.17 mile from its confluence with Econfina Creek. A sizable, sandy vent is imbedded in the bottom of a pool approximately 25 feet across. A gentle surface boil is evident and there is a continual plume of sediment moving in the pool. Maximum depth measured in the vent is 11.5 feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1D	302543.089	853246.500	The vent is in Gainer Springs #1 run approximately 0.28 mile from its confluence with Econfina Creek. Two small vents with sandy, shelly bottoms discharge laterally from either side of a small peninsula on the east bank. The maximum depth measured is 1.3 feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1E	302543.154	853247.296	The vent is in Gainer Springs #1 run approximately 0.26 mile from its confluence with Econfina Creek. A small vent approximately 1.5 feet wide opens in the bottom of the run. There is a slight surface boil. Maximum depth measured in the vent is four feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1F	302543.201	853248.221	The vent is in Gainer Springs #1 run approximately 0.29 mile from its confluence with Econfina Creek. A sizable, sandy vent approximately two feet wide opens in the bottom of the run. The opening is crossed with branches and small logs. A surface boil and sediment plume are visible. Maximum depth measured in the vent is 3.5 feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1G	302538.610	853248.468	The vent is in Gainer Springs #1 run approximately 0.11 mile from its confluence with Econfina Creek. A small, sandy bottomed vent opens in the bottom of the run. The spring pool area is approximately 20 feet in diameter and the maximum depth measured in the vent is five feet. The vent is on Water Management District land and is used for recreation.

GAINER SPRINGS #1H	302538.594	853249.086	The vent is a crack in the bottom of a pool on the southeast side of Gainer Springs #1 run approximately 0.1 mile from its confluence with Econfina Creek. The pool is approximately 15 feet wide with a maximum depth of four feet. The vent is on Water Management District land and is used for recreation.
GAINER SPRINGS #1I	302538.551	853251.682	The vent is located on Water Management District land on the east bank of Gainer Springs #1 run approximately 85 feet from its confluence with Econfina Creek. A small, sandy vent emerges laterally from beneath the roots of a tree growing atop a six foot limestone bluff. Maximum depth measured in the vent is two feet.
GAINER SPRINGS #2	302538.725	853253.716	The vent is a crack at the base of a 25 foot limestone bluff on the west side of the creek. There is a cove carved into the bank with a small, man-made "beach" to the south. The cove is approximately 30 feet in diameter with a maximum depth of approximately 12 feet. There is a strong boil at this vent. A six-inch PVC pipe extends into the spring vent. There is a crack in the limestone bluff to the north of the main vent which discharges ground water as well. This vent is approximately 0.4 mile south of the Highway 20 bridge. The vent is on private land and is utilized for recreation.
GAINER SPRINGS #3	302543.951	853255.726	The entrance to the run is approximately 0.42 mile south of the Highway 20 bridge on the west side of the creek. The run turns north and parallels the creek for 400 feet. The pool is approximately 250 feet in diameter with a small, man-made beach to the north and a small island in the center. There are several vents opening in the bottom, near the edges of the pool. Several of the vents have a surface boil. The maximum depth measured in one of the vents is 11 feet. The vent is on private land and is used for recreation.
GAINER SPRINGS #4	302531.484	853254.420	Water emerges laterally from several areas beneath a 20 foot limestone bluff into two small coves directly adjacent to the creek. The largest cove is approximately 20 feet in diameter with a maximum depth of 1.3 feet. The second cove is to the south and separated from the other by a thin spit of land. In times of high water, these pools are covered by the creek. The vents are approximately 0.6 mile south of the Highway 20 bridge. The vent is on private land and is utilized for recreation.
GAINER SPRINGS #5	302537.004	853253.958	Water emerges laterally from beneath a limestone bluff into a pool approximately 12 feet in diameter with a maximum depth of one foot. The run is approximately 200 feet long and runs parallel to the creek. In times of high water, this pool and run are covered by the creek. The mouth of the run is 0.5 mile south of the Highway 20 bridge. The vent is on private land and is utilized for recreation.
GLOWING SPRING	302722.250	853155.957	The vent is a crack in the limestone of the creek bottom on the west side approximately 3.5 miles north of the Highway 20 bridge. There is a noticeable surface boil at low or moderate water levels. The maximum depth measured in the vent is 13 feet.

PALM SPRING #1	302730.700	853159.700	This spring is located in the Econfina Creek watershed. The entrance to the run is located approximately 3.3 miles north of the Hwy 20 bridge over Econfina creek. The pool, approximately 20 feet in diameter and 5 feet deep, is located at the end of a 175 foot run. A small central vent, a limestone cavity approx. 2 feet in diameter, can be observed creating a small surface boil. Except directly surrounding the spring vent, the pool bottom is covered with silt and silt smothered woody debris. This pristine spring is on Water Management District land and may only occasionally be visited for recreation.
PALM SPRING #2	302730.600	853159.900	The vent is located in the spring run of Palm Spring approximately 150 feet from its confluence with Econfina Creek. The spring is a small depression, 0.75 feet deep, covered in sand dusted woody debris. Several separate sand boils are located in the run bottom surrounding the spring.
PITTS SPRING	302558.566	853246.669	This spring vent is located just north of Highway 20. The vent emerges from beneath a submerged limestone ledge into a 40-foot diameter pool. The mouth of the 50-foot run is on the west side of the creek approximately 600 feet north of the Highway 20 bridge. Maximum depth measured in the mouth of the vent is 11.5 feet but the conduit extends further and downward. There is a gentle surface boil. The pool is surrounded by a concrete wall to stabilize the bank and steps lead down to the water. There is a restroom and picnic area adjacent to the spring pool. The vent is on Water Management District land and is used for recreation.
STRICKLAND SPRING GROUP			This set of spring vents is located in the Econfina Creek watershed. The combined run of this spring is used as the put-in for Econfina Canoe Livery. The spring is on private land and is used for recreation.
STRICKLAND SPRING #1	302628.873	853238.840	Four main vents discharge laterally into a 15 foot diameter pool at the head of the run. The vent with the largest discharge is beneath a seven foot limestone bluff. Maximum depth in the pool is ten inches.
STRICKLAND SPRING #2	302626.643	853241.634	Several vents--one with a surface boil--are contained in a 30 foot diameter pool approximately 250 feet up the run from its mouth. Water also discharges laterally from beneath a ten foot bluff. Maximum depth in the vent with the boil is 3.3 feet.
SYLVAN SPRINGS GROUP			This spring group is located in the Econfina Creek watershed and consists of several vents on the west side of the Creek. The spring group is on Water Management District land and is used for recreation.

SYLVAN SPRINGS #1	302554.625	853253.782	Ground water discharges laterally from a series of fissures in the limestone bank and from several vents in the bottom of the pool. Three prominent surface boils are apparent in the 50 foot diameter pool. The pool lies at the head of the run approximately 400 feet from where it meets the creek. Maximum depth in the largest vent is 3.8 feet.
SYLVAN SPRINGS #2	302602.237	853255.129	Ground water discharges laterally from a maze of fissures in a collapsed limestone outcrop as well as from a number of sand boils. The vents combine in the 30 foot diameter pool before flowing 800 feet to converge with the Sylvan main run. Maximum depth in the pool is 0.6 foot.
SYLVAN SPRINGS #3	302556.773	853255.767	Ground water discharges laterally from two vents beneath a 20 foot limestone bank. The discharge runs together into a pool approximately 15 feet across. The run from this set of vents runs into the Sylvan Springs #1 pool. Maximum depth in the pool is 1.3 feet.
TUPELO SPRING	302837.500	853136.600	This spring is located in the Econfina Creek watershed. The spring vent is located on the west bank of Econfina Creek, approximately 0.83 miles downstream of Walsingham Bridge. The spring is composed of two vents, each approx. 4 feet deep, separated by a fallen tupelo tree. The vents discharge into a shallow sediment laden pool separated from the Econfina by a low sandbar. At times of high water the pool is covered by Econfina Creek. A small recreational clearing with chairs and tables is located across the creek from the spring. The spring is adjacent to Water Management District Land.
WILLIFORD SPRING GROUP			Williford Spring is a single large vent at the head of its run. However, several smaller vents contribute their discharge to the run before it enters Econfina Creek. The mouth of the run is on the west side of the creek approximately 0.81 miles north of the Highway 20 bridge.
WILLIFORD SPRING	302622.402	853251.343	This spring vent emerges from beneath a submerged limestone ledge into a 40-foot diameter pool. Maximum depth measured in the mouth of the vent is 12 feet but the conduit extends further and downward. There is a large surface boil. A number of ancillary vents are scattered along the west bank of the 450 foot long run. The spring is next to a Water Management District recreation area.
WILLIFORD RUN #1	302622.454	853252.389	This spring vent is located in the Econfina Creek watershed. Ground water discharges laterally from beneath a collapsing limestone bank into a short run that joins other small ancillary vent runs before entering the main Williford Spring run from the west. Maximum depth measured at the vent is approximately four inches. On several visits to this site, the spring has been observed to run dry. The discharge seems to be closely tied to rainfall.

WILLIFORD RUN #2	302622.454	853252.389	This spring vent is located in the Econfina Creek watershed. Ground water discharges laterally from beneath a collapsing limestone bank into a short run that joins other small ancillary vent runs before entering the main Williford Spring run from the west. Maximum depth measured at the vent is approximately eight inches.
WILLIFORD RUN #3	302622.036	853253.416	This spring vent is located in the Econfina Creek watershed. Ground water discharges laterally from beneath a collapsing limestone bank into a short run that joins other small ancillary vent runs before entering the main Williford Spring run from the west. Maximum depth measured at the vent is approximately six inches.
WILLIFORD RUN #4	302621.987	853254.108	This spring vent is located in the Econfina Creek watershed. Ground water discharges from a small opening in the limestone bottom of its small pool. Its short run joins other small ancillary vent runs before entering the main Williford Spring run from the west. Maximum depth measured at the vent is approximately 18 inches. The vent is on Water Management District land and is used for recreation.
WILLIFORD RUN #5	302621.162	853254.414	This spring vent is located in the Econfina Creek watershed. Ground water discharges from a small opening in the limestone bottom of the ancillary vents' run. A surface boil is apparent. Maximum depth measured at the vent is 4.5 feet.
WILLIFORD RUN #6	302621.162	853254.414	This spring vent is located in the Econfina Creek watershed. Ground water discharges from a small opening in the limestone bottom of the ancillary vents' run. A surface boil is apparent. Maximum depth measured at the vent is two feet. The vent is on Water Management District land and is used for recreation.
WILLIFORD RUN #7	302620.727	853254.806	This spring vent is located in the Econfina Creek watershed. Ground water discharges laterally from beneath a seven foot limestone bluff into a short run that joins other small ancillary vent runs before entering the main Williford Spring run from the west. Maximum depth measured at the vent is approximately six inches. The vent is on Water Management District land and is used for recreation.

ECONFINA CREEK SPRINGS PHOTOGRAPHS

Barking Spring

Bluff Spring

Bathtub Spring

Devils Hole

Blue Spring #1

Blue Spring #2

Blue Spring #3

Fenceline Spring

Gainer Spring #1a

Gainer Spring #1b

Gainer Spring #1c

Gainer Spring #1d

Gainer Spring #1e

Gainer Spring #1f

Gainer Spring #1g

Gainer Spring #1h

Gainer Spring #1i

Gainer Spring #2

Gainer Spring #3

Gainer Spring #4

Gainer Spring #5

Glowing Spring

Palm Spring #1

Palm Spring #2

Pitts Spring

Strickland Spring #1

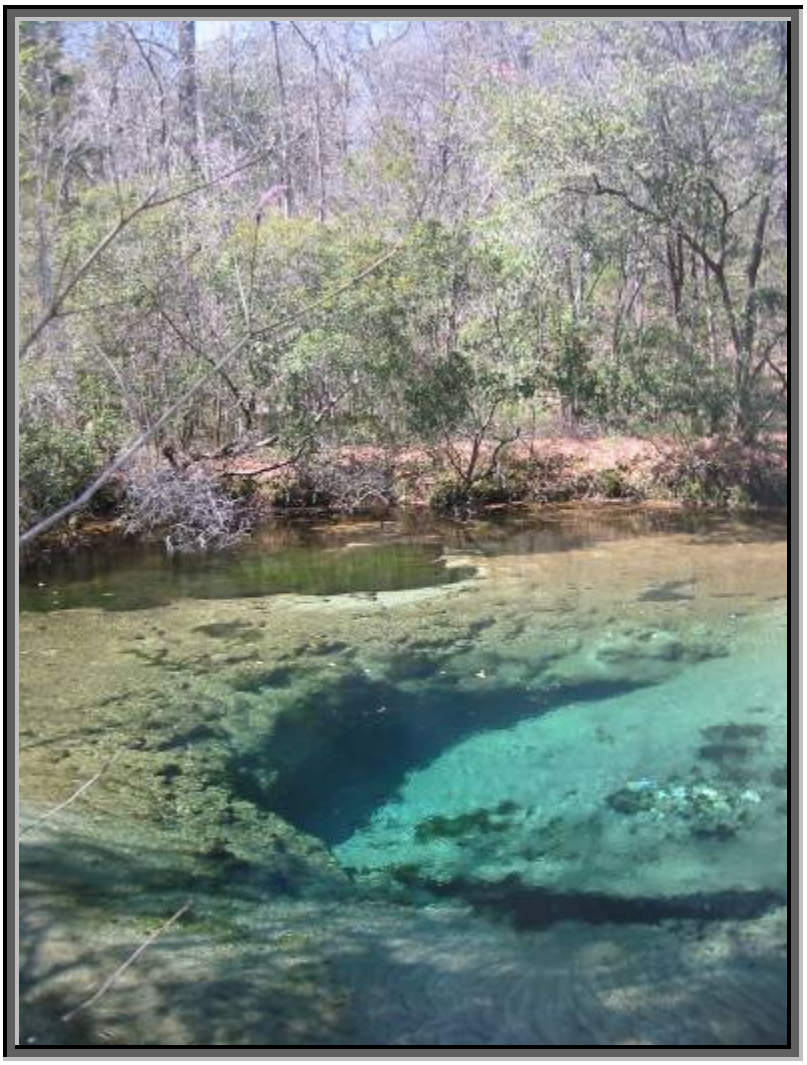
Strickland Spring #2

Sylvan Spring #1

Sylvan Spring #2

Sylvan Spring #3

Tupelo Spring



Williford Spring

Williford Run #1

Williford Run #2

Williford Run #3

Williford Run #4

Williford Run #5

Williford Run #6

Williford Run #7