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2009 NW 67th Place, Gainesville, FL 32653 -1603 • 352.955.2200

# MEETING NOTICE

## REGIONAL PLANNING COMMITTEE

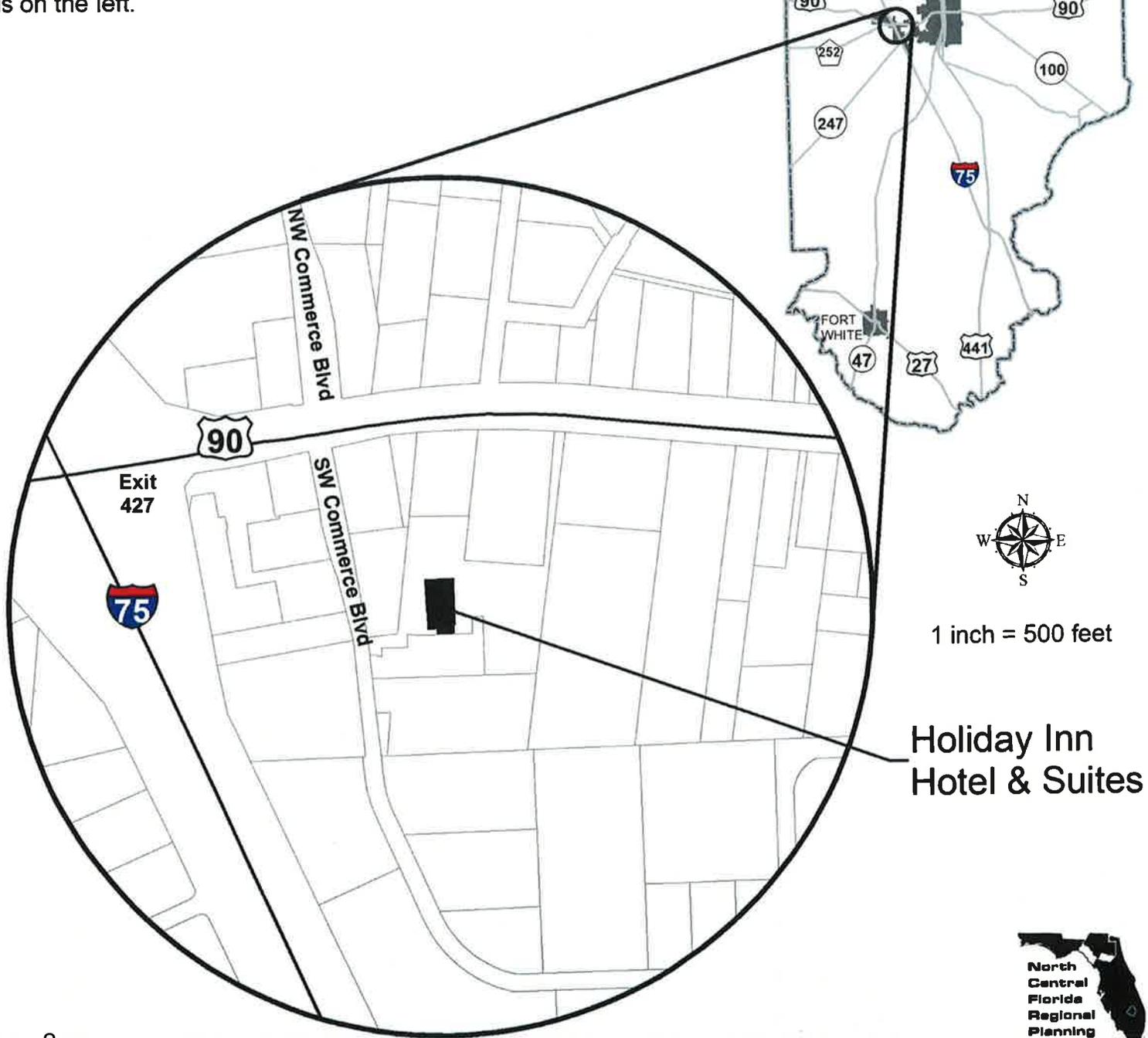
There will be a meeting of the Regional Planning Committee of the North Central Florida Regional Planning Council on **May 28, 2015**. The meeting will be held at the **Holiday Inn Hotel & Suites, 213 SW Commerce Boulevard, Lake City**, beginning at **6:30 p.m.**

(Location Map on Back)

# Holiday Inn Hotel & Suites

213 SW Commerce Blvd  
Lake City, Florida 32025

Directions: From the intersection of Interstate 75 and U.S. Highway 90 (exit 427) in the City of Lake City turn, East onto U.S. Highway 90, travel approximately 450 feet to SW Commerce Blvd, turn right (South) onto SW Commerce Blvd, travel approximately 720 feet and the Holiday Inn Hotel & Suites is on the left.





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## AGENDA

### REGIONAL PLANNING COMMITTEE

Holiday Inn Hotel & Suites  
Lake City, Florida

May 28, 2015  
6:30 p.m.

	<b><u>PAGE NO.</u></b>
I. APPROVAL OF THE APRIL 23, 2015 MEETING MINUTES	<b>5</b>
II. NATURAL RESOURCES OF REGIONAL SIGNIFICANCE ELEMENT	<b>7</b>

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NORTH CENTRAL FLORIDA REGIONAL PLANNING COUNCIL

REGIONAL PLANNING COMMITTEE

MINUTES

Holiday Inn Hotel & Suites  
Lake City, Florida

April 23, 2015  
6:30 p.m.

MEMBERS PRESENT

Beth Burnam, Vice-Chair  
Donnie Hamlin  
James Montgomery  
Lorene Thomas  
Robert Wilford  
Stephen Witt

MEMBERS ABSENT

Chuck Chestnut, IV  
Randy Wells, Chair  
Mike Williams

STAFF PRESENT

Steven Dopp

Chair Wells called the meeting to order at 6:30 p.m.

I. APPROVAL OF THE MARCH 26, 2015 MEETING MINUTES

**ACTION:** It was moved by Commissioner Wilford and seconded by Mayor Witt to approve the March 26, 2015 Committee minutes as circulated. The motion carried unanimously.

II. EMERGENCY PREPAREDNESS DEVELOPMENT ELEMENT

Mr. Dopp presented the staff evaluation of the Emergency Preparedness Element. The Committee reviewed and discussed the staff evaluation. The Committee agreed by consensus to withhold approval of the evaluation until completion of the review of all elements of the regional plan.

The meeting adjourned at 6:50 p.m.

\_\_\_\_\_  
Randy Wells, Chair

5/28/15  
Date



# NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

## INTRODUCTION

In May 2015, Governor Rick Scott signed into law Senate Bill 1216 which eliminated the Withlacoochee Regional Planning Council and transferred its member counties to adjoining regional planning councils. Levy County and Marion County are now part of the North Central Florida Regional Planning Council. As part of the legislation, the Strategic Regional Policy Plan for the Withlacoochee Region remains in place for Levy and Marion Counties until such time as the two counties are incorporated into the North Central Florida Strategic Regional Policy Plan.

The Strategic Regional Policy Plan for the Withlacoochee Region, as the North Central Florida Strategic Regional Policy Plan, identifies and maps Natural Resources of Regional Significance and contains goals and policies addressing Natural Resources of Regional Significance.

### **REGIONAL GOAL 4.1. USE THE NATURAL RESOURCES OF THE REGION IN A SUSTAINABLE MANNER.**

#### **REGIONAL INDICATORS**

1. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of silvicultural best management practices is unknown.
2. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of low impact development practices is unknown.
3. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of energy conservation design principles is unknown.
4. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of water conservation and reuse strategies is unknown.
5. As of 2009, with the exception of intracounty groundwater transfer by Gainesville Regional Utilities, no interbasin transfer of water occurs in the region.
6. As of January 2010, north central Florida has 39 megawatts of electrical generation capacity using biomass as the primary fuel source.

**REGIONAL GOAL 4.2.**

**PRESERVE BIG BEND COASTAL AND MARINE RESOURCES IDENTIFIED AS NATURAL RESOURCES OF REGIONAL SIGNIFICANCE FOR FUTURE GENERATIONS OF RESIDENTS IN RECOGNITION OF THEIR ECONOMIC AND ECOLOGICAL IMPORTANCE TO THE REGION.**

**REGIONAL INDICATORS**

1. As of January, 2000, the Big Bend Salt Marsh (Dixie and Taylor County) coastline comprised 48,190 acres.
2. In 2001, that portion of the Big Bend Seagrass Beds extending 6 nautical miles seaward of the Dixie County and Taylor County coastline was comprised of 102,530.5 acres of bays and estuaries, 63,992.3 acres of open water, 7,638.6 acres of tidal flats, 11,515.0 acres of patchy seagrass, 192,556.6 acres of continuous seagrass, and 108,423.7 acres which were unclassified.<sup>1</sup>
3. In 1996, the Florida Middle Ground comprised 132,000 acres.
4. As of January 2007, a Florida Department of Health No-Fish-Consumption Advisory is in effect for the Fenholloway River due to elevated mercury levels in the river's of fish in the river.
5. As of April 2007, the Fenholloway River is in violation of U.S. Environmental Protection Agency water quality standards for dissolved oxygen, biochemical oxygen demand, un-ionized ammonia, fecal coliform and dioxin.
6. As of January 2007, there were 16 National Pollutant Discharge Elimination System stormwater facility permits and 8 National Pollutant Discharge Elimination System wastewater permits in Taylor County. In 2006, there were 4 National Pollutant Discharge Elimination System stormwater facility permits and 2 National Pollutant Discharge Elimination System wastewater permits in Dixie County.
7. As of January 2007, the communities of Fanning Springs and Old Town were not serviced by a centralized wastewater treatment system.
8. As of January 2007, no offshore oil or natural gas wells are located within 100 miles of the Dixie and Taylor counties coastline.
9. As of January, 2007, no offshore oil or natural gas wells are located within the Florida Middle Ground.

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<sup>1</sup>North Central Florida Regional Planning Council, March 2007. Derived from Seagrass Habitat and Monitoring in Florida's Big Bend, Florida Fish and Wildlife Research Institute and Suwannee River Water Management District, 2006.

**REGIONAL GOAL 4.3. MAINTAIN AN ADEQUATE SUPPLY OF HIGH-QUALITY GROUNDWATER TO MEET THE NEEDS OF NORTH CENTRAL FLORIDA RESIDENTS, IN RECOGNITION OF ITS IMPORTANCE TO THE CONTINUED GROWTH AND DEVELOPMENT OF THE REGION.**

**REGIONAL INDICATORS**

1. As of January 2002, the quantity of potable water contained in the Floridan Aquifer underlying the north central Florida region, its average daily recharge and discharge, were unknown.
2. In 2000, an estimated 232.2 million gallons per day of water were withdrawn from north central Florida groundwater sources.
3. As of January, 2002, north central Florida contained 26 first-magnitude springs, 101 second-magnitude springs, and 70 third-magnitude springs.
4. As of May 2007, the known Nitrate Nitrogen readings for north central Florida first magnitude springs, and their date of measure, were as follows (see Table 4.5):

**REGIONAL GOAL 4.4. PROTECT ALL SOURCES OF RECHARGE TO THE FLORIDAN AQUIFER FROM ALL ACTIVITIES WHICH WOULD IMPAIR THESE FUNCTIONS OR CAUSE A DEGRADATION IN THE QUALITY OF THE WATER BEING RECHARGED IN RECOGNITION OF THE IMPORTANCE OF MAINTAINING ADEQUATE SUPPLIES OF HIGH-QUALITY GROUNDWATER FOR THE REGION.**

**REGIONAL INDICATORS**

1. As of January, 2011, the St. Johns River, the Suwannee River Water Management District, Alachua County, and Columbia County had identified and mapped 968,600.90 acres of areas of high recharge potential to the Floridan Aquifer within north central Florida.
2. In Fiscal Year 2005-06, there were 167,629 visitors to Ichetucknee Springs State Park.<sup>2</sup>
3. As of January, 2007, the Suwannee River Water Management District had identified and mapped 153,588 acres of stream-to-sink watersheds located within both its jurisdictional boundaries and within north central Florida.
4. In 2007, eight sinks were delineated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.

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<sup>2</sup>2006 Florida Statistical Abstract, Table 19.52.

**REGIONAL GOAL 4.5. PROTECT ALL LISTED SPECIES WITHIN THE REGIONAL ECOLOGICAL GREENWAYS NETWORK.<sup>3</sup>**

**REGIONAL INDICATORS**

1. As of September 2009 the Regional Ecological Greenways Network comprised 1,316,360 acres in north Central Florida.

**REGIONAL GOAL 4.6. PROTECT NATURAL RESOURCES OF REGIONAL SIGNIFICANCE IDENTIFIED IN THIS PLAN AS "PLANNING AND RESOURCE MANAGEMENT AREAS."**

**REGIONAL INDICATORS**

1. As of January 2011, north central Florida contained 2,640 acres of private conservation lands.
2. As of January 2011, north central Florida contained approximately 139,165 acres of federally-owned conservation lands.
3. As of January 2011, north central Florida contained 125,992 acres of state-owned conservation and recreation lands.
4. As of January 2011, north central Florida contained approximately 246,820 acres of water management District-owned conservation lands (including less than fee simple ownership).
5. In January 2011, north central Florida had 22 waterbodies identified as SWIM waterbodies.

**REGIONAL GOAL 4.7. MAINTAIN THE QUANTITY AND QUALITY OF THE REGION'S SURFACE WATER SYSTEMS IN RECOGNITION OF THEIR IMPORTANCE TO THE CONTINUED GROWTH AND DEVELOPMENT OF THE REGION.**

**REGIONAL INDICATORS**

1. As of January, 2000, the water management districts had identified 1,109,868 acres of fresh water wetlands within the region.
2. As of January, 2002, 10 north central Florida lakes were identified as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
3. As of January, 2002, 11 river corridors were designated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.

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<sup>3</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.

4. As of January, 2002, 202,152 acres of river corridor were designated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
5. As of January, 2011, 111 North central Florida springs were listed as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
6. In January, 2006, 12 north central Florida Natural Resources of Regional Significance were under a consumption advisory for Bowfin.
7. In January, 2006, 11 north central Florida Natural Resources of Regional Significance were under a consumption advisory for Large-mouth bass and Gar.
8. In January, 2006, seven north central Florida Natural Resources of Regional Significance were under a consumption advisory for Redbreast Sunfish and Redear Sunfish.
9. In January, 2006, five north central Florida Natural Resources of Regional Significance were under a consumption advisory for Brown Bullhead.
10. In January, 2006, four north central Florida Natural Resources of Regional Significance were under a consumption advisory for Black Crappie, Bluegill, Channel Catfish, and White Catfish.
11. In January, 2006, three north central Florida Natural Resources of Regional Significance were under a consumption advisory for Spotted Sunfish.
12. In January, 2006, one north central Florida Natural Resource of Regional Significance were under a consumption advisory for Chain Pickerel and Warmouth.
13. As of June 2007, minimum flows and levels have been established for the lower Suwannee River, Madison County Blue Spring, and Fanning Spring.

**RECOMMENDED MODIFICATIONS TO**  
**THE NORTH CENTRAL FLORIDA STRATEGIC REGIONAL POLICY PLAN**

It is recommended that the Natural Resources of Regional Significance Element be amended to identify and map Natural Resources of Regional Significance located in Levy and Marion Counties. It is further recommended that the Regional Indicators be updated to include identified and mapped Natural Resources of Regional Significance located in Levy and Marion Counties. Finally, it is recommended that Tables 4.1 through 4.7 be updated to reflect the latest available data as well as the inclusion of Levy and Marion Counties.





# Chapter IV

## Natural Resources of Regional Significance

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011

**Chapter IV- Natural Resources of Regional Significance**



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Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011

**Chapter IV- Natural Resources of Regional Significance**



# Chapter IV: Natural Resources of Regional Significance

## A. Conditions and Trends

### 1. Introduction

North central Florida is one of the largest planning districts in the state in terms of area yet one of the smallest in terms of population. As a result, the region has large expanses of undeveloped areas and unspoiled natural resources. The region consists of 6,813 square miles, all of which is classified by the Council as a Natural Resource of Regional Significance.<sup>1</sup>

Natural resources of regional significance are natural resources or systems of interrelated natural resources, which due to their function, size, rarity, or endangerment, provide benefits of regional significance to the natural or human environment.<sup>2</sup> They consist of both coastal and inland wetlands, rivers and their associated floodplains, large forested areas, lakes, springs, the Floridan Aquifer, and land areas with the potential to adversely affect the water quality of the aquifer (stream-to-sink watersheds and high recharge areas). High priority habitat of listed species is also recognized as a Natural Resource of Regional Significance.<sup>3</sup>

Regionally significant natural resources play important roles in the region's economy and quality of life. Drinking water for most residents is drawn from the Floridan Aquifer. The Suwannee-Santa Fe river system and fresh water wetlands serve a valuable role in regulating surface water runoff and flooding. The salt marsh provides a valuable breeding ground for many varieties of commercial seafood. Commercial forest lands play an important role in the regional economy, while public lands provide valuable resource-based recreation for north central Florida residents. Both private and public lands provide important habitats for the survival of native plant and animal species. Nearly all identified Natural Resources of Regional Significance play, or can play, an important role in the region's budding ecotourism industry.

The mission of the North Central Florida Regional Planning Council is to improve the quality of life of the Region's citizens by coordinating growth management, protecting regional resources, promoting economic development and providing technical services to local governments. The North Central Florida Strategic

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<sup>1</sup>Includes the Floridan Aquifer, a Natural Resource of Regional Significance which underlies the entire region.

<sup>2</sup>North central Florida regionally significant facilities and resources, as defined in Rule 27E.005, Florida Administrative Code, consist of Regionally Significant Emergency Preparedness Facilities identified in Table 3.4, Natural Resources of Regional Significance identified in Table 4.1, Regionally Significant Transportation Facilities identified in Table 5.8, and Regionally Significant Facilities and Resources, identified in Section VI.

<sup>3</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.



Regional Policy Plan implements the mission statement by balancing sustainable economic development with the protection of Natural Resources of Regional Significance.

The regional plan balances economic development with the protection of Natural Resources of Regional Significance. It seeks the protection of the functions and qualities of Natural Resources of Regional Significance. Therefore, the plan allows development and economic activity within and near Natural Resources of Regional Significance to the extent that such development and economic activity does not significantly and adversely affect the functions of the resource.

Furthermore, the scope of the regional plan goals and policies is limited to Natural Resources of Regional Significance and regional facilities which are specifically identified and mapped in the regional plan, as well as the extent to which the plans of one local government effect other local governments. The type and extent of economic activity which can occur without significantly and adversely impacting a Natural Resource of Regional Significance is framed by the goals and policies of the regional plan.

Although mapped as discrete geographic units, Natural Resources of Regional Significance are really parts of an interconnected natural system extending across and beyond the region. Actions in one part of the system can have significant adverse consequences elsewhere. For example, the Big Bend Seagrass Beds and the fishery it supports are dependent upon fresh water flows from the Suwannee and other coastal rivers. The rivers are in turn dependent upon headwater swamps for their base flows of fresh water. Dredging and filling headwater swamps, such as the Okefenokee Swamp in Georgia and north central Florida's San Pedro Bay and Mallory Swamp, could have negative impacts upon the seagrass beds and coastal fishery. One purpose of the regional plan is to identify Natural Resources of Regional Significance and include strategies to minimize potential adverse impacts to these resources while promoting economic activities such as agriculture and silviculture within these areas, especially where such resources are in private ownership.

Natural resources of regional significance are grouped into five categories: Coastal and Marine Resources, Groundwater Resources, Natural Systems, Planning and Resource Management Areas, and Surface Water Systems. The text, maps, and policies of this element are organized around the five map layers.<sup>4</sup>

Natural resources of regional significance are listed in Table 4.1. The regional plan identifies 213 Natural Resources of Regional Significance. Quantifying the number of identified Natural Resources of Regional Significance is difficult. Several are listed multiple times. Some natural resources, such as Peacock Springs State Recreation Area, contain springs which are designated as Natural Resources of Regional Significance in their own right. Areas of High Recharge Potential to the Floridan Aquifer are listed only once. However, the Groundwater Resources map identifies over one million acres as potential high aquifer recharge area. Some resources defy counting. For example, approximately 1,331 parcels of land owned by the Suwannee and St. Johns water management districts are recognized as Natural Resources of Regional Significance. Many of these parcels are adjacent to one another, which could justify grouping them together for a lower parcel count. Instead, they are counted as one natural resource and classified as "Water Management District Lands." Similarly, local government-owned land is counted as one natural resource and classified as Local Government Conservation Areas.

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<sup>4</sup>The Floridan Aquifer is not mapped since it underlies the entire region; the Florida Middle Ground and the Okefenokee National Wildlife Refuge are also not mapped as they are outside the region; the Big Bend Seagrass Beds are only partially mapped as much of the resource is located beyond the state's jurisdiction.



Maps of Natural Resources of Regional Significance included in the regional plan vary widely in terms of accuracy. Some coverages, such as the Suwannee River Corridor, were imported directly into the Council's computerized geographic information system from the Suwannee River Water Management District. Coverages (maps) which are directly imported from one geographic information system to another represent the most accurate coverages contained in the regional plan. However, most coverages depicted in the regional plan maps were hand-digitized by Council staff from paper maps. The Council's hand-digitized coverages vary widely in terms of detail and accuracy. While reasonably accurate for purposes of presentation in the regional plan, they should not be used as a substitute for the source maps from which they were derived.

**TABLE 4.1**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
<b>Coastal and Marine Resources</b>	Big Bend Salt Marsh	Big Bend Salt Marsh	48,190.00
<b>Coastal and Marine Resources</b>	Big Bend Seagrass Beds	Big Bend Seagrass Beds	486,657.00
<b>Coastal and Marine Resources</b>	Florida Middle Ground	Florida Middle Ground	132,000.00
<b>Groundwater Resources</b>	Areas of High Recharge Potential to the Floridan Aquifer	Areas of High Recharge Potential to the Floridan Aquifer	968,600.90
<b>Groundwater Resources</b>	Floridan Aquifer	Floridan Aquifer	4,415,998.00
<b>Groundwater Resources</b>	Ichetucknee Trace	Ichetucknee Trace	10,767.00
<b>Groundwater Resources</b>	Sinks	Alachua Sink	1.00
<b>Groundwater Resources</b>	Sinks	Aucilla River Sinks	2,000.00
<b>Groundwater Resources</b>	Sinks	Brooks Sink	1.00
<b>Groundwater Resources</b>	Sinks	Clay Sink	1.00
<b>Groundwater Resources</b>	Sinks	Devil's Millhopper	1.00
<b>Groundwater Resources</b>	Sinks	O'leno Sink	1.00
<b>Groundwater Resources</b>	Sinks	Rose Sink	1.00
<b>Groundwater Resources</b>	Sinks	Saylor Sink	1.00
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Sinking Branch	1,596.00
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Cannon Creek/Columbia Rose Creek/ Clay Hole Creek	34,303.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Indian Mound Swamp/ South Falling Creek/ Turkey Prairie	30,759.00
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Little River	35,639.00
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Norton Creek	9,337.00
<b>Groundwater Resources</b>	Stream-to-Sink Watershed	Alachua Slough/Blues Creek/Burnett Lake/Mill Creek Sink/Hammock Branch/North Alachua/Pareners Branch/Turkey Creek	41,954.00
<b>Natural Systems</b>	State Ecological Greenways Network	Regional Ecological Greenways Network	1,316,360.00
<b>Planning &amp; Resource Management Areas</b>	Private Lands	n/a	2,640.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Aucilla River Sinks	1,097.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Austin Cary Memorial Forest	2,076.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Big Bend Coastal Tracts	70,949.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Big Gum Swamp National Wilderness Area	3,374.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Big Shoals State Forest	1,636.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Blue Springs State Forest	2,004.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Local Government Conservation Areas	16,229.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Devil's Millhopper Geologic State Park	67.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Econfina River State Park	4,389.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Gum Root Park	370.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Ichetucknee Springs State Park	2,525.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Lake Alto Preserve	672.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE (Continued)**

Map Layer	Classification	Name	Acreage
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Lochloosa Wildlife Conservation Area	10,352.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Lower Suwannee River National Wildlife Refuge	28,634.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Okefenokee National Wildlife Refuge	0.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	O'leno State Park	1,720.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Osceola National Forest	109,247.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Paynes Prairie Preserve State Park	21,657.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Peacock Springs Conservation Area	1,115.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	River Rise State Preserve	4,480.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	St. Marks National Wildlife Refuge	1284.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	San Felasco Hammock State Preserve	7,129.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Santa Fe Swamp Conservation Area	7,403.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Steven Foster State Folk Cultural Center	895.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Suwannee River State Park	1,994.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Upper Alapaha Conservation Area	2,245.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Water Management District Easements	93,064.00
<b>Planning &amp; Resource Management Areas</b>	Public Lands	Water Management District Lands	153,756.47
<b>Planning &amp; Resource Management Areas</b>	Surface Water Improvement Management Waterbodies	Alapaha River	218.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Alligator Lake	968.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Aucilla River	509.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Econfina River	212.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Fenholloway River	212.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Hampton Lake	816.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lake Alto	548.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lake Crosby	534.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lochloosa Lake	5,629.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lake Rowell	357.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lake Sampson	2,013.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Lake Santa Fe	4,211.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Little Santa Fe Lake	1,096.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	New River	182.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Newnans Lake	6,019.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Olustee Creek	121.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Orange Lake	9,533.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Santa Fe River	836.40

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
<b>Planning &amp; Resource Management Areas</b>	Surface Water Improvement Management Waterbodies	Steinhatchee River	170.00
<b>Planning &amp; Resource Management Areas</b>	Surface Water Improvement Management Waterbodies	Suwannee River	3,764.00
<b>Planning &amp; Resource Management Areas</b>	Surface Water Improvement Management Waterbodies	Withlacoochee River	376.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Bee Haven Bay	7,125.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	California Swamp	21,786.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Dixie County Coastal Fresh Water Wetlands	155,642.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Gum Root Swamp	1,448.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Hixtown Swamp	10,289.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Lake Alto Swamp	1,405.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Lochloosa Forest	28,451.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Mallory Swamp	210,399.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Osceola National Forest/Pinhook Swamp	184,350.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Paynes Prairie	21,657.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	San Pedro Bay	305,375.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Santa Fe Swamp	7,403.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Spring Warrior Swamp	16,039.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Taylor County Coastal Fresh Water Wetlands	51,731.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Tide Swamp	15,236.00
<b>Surface Water Systems</b>	Fresh Water Wetlands	Wacassassa Flats	61,653.00
<b>Surface Water Systems</b>	Lakes	Alligator Lake	968.00
<b>Surface Water Systems</b>	Lakes	Lake Butler	436.00
<b>Surface Water Systems</b>	Lakes	Lake Geneva	57.76
<b>Surface Water Systems</b>	Lakes	Lake Sampson	2,013.00
<b>Surface Water Systems</b>	Lakes	Lake Santa Fe	4,211.00
<b>Surface Water Systems</b>	Lakes	Little Santa Fe Lake	1,096.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Surface Water Systems	Lakes	Lochloosa Lake	5,629.00
Surface Water Systems	Lakes	Newnans Lake	6,019.00
Surface Water Systems	Lakes	Orange Lake	9,533.00
Surface Water Systems	Lakes	Watermelon Pond	989.00
Surface Water Systems	River Corridors	Alapaha River	9,069.00
Surface Water Systems	River Corridors	Aucilla River	4,059.00
Surface Water Systems	River Corridors	Cross Creek	530.00
Surface Water Systems	River Corridors	Econfina River	11,743.00
Surface Water Systems	River Corridors	Ichetucknee River	451.00
Surface Water Systems	River Corridors	Prairie Creek	873.00
Surface Water Systems	River Corridors	River Styx	1,772.00
Surface Water Systems	River Corridors	Santa Fe River	17,868.00
Surface Water Systems	River Corridors	Steinhatchee River	8,983.00
Surface Water Systems	River Corridors	Suwannee River	133,924.00
Surface Water Systems	River Corridors	Withlacoochee River	12,880.00
Surface Water Systems	Springs	ALA112971	1.00
Surface Water Systems	Springs	ALA930971	1.00
Surface Water Systems	Springs	ALA930972	1.00
Surface Water Systems	Springs	Alapaha Rise	1.00
Surface Water Systems	Springs	Allen Mill Pond	1.00
Surface Water Systems	Springs	Anderson Spring	1.00
Surface Water Systems	Springs	Bathtub	1.00
Surface Water Systems	Springs	Blue Hole	1.00
Surface Water Systems	Springs	Blue Sink	1.00
Surface Water Systems	Springs	Blue Spring Near Mayo	1.00
Surface Water Systems	Springs	Bonnet	1.00
Surface Water Systems	Springs	Branford Spring	1.00

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**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Surface Water Systems	Springs	Cedar Head	1.00
Surface Water Systems	Springs	Charles Spring	1.00
Surface Water Systems	Springs	COL61981	1.00
Surface Water Systems	Springs	COL928972	1.00
Surface Water Systems	Springs	COL930971	1.00
Surface Water Systems	Springs	COL1012971	1.00
Surface Water Systems	Springs	COL101974	1.00
Surface Water Systems	Springs	Columbia Spring	1.00
Surface Water Systems	Springs	Copper Spring	1.00
Surface Water Systems	Springs	Darby	1.00
Surface Water Systems	Springs	Devil's Ear	1.00
Surface Water Systems	Springs	Devil's Eye Spring	1.00
Surface Water Systems	Springs	DIX625993	1.00
Surface Water Systems	Springs	Dogwood	1.00
Surface Water Systems	Springs	Ellaville Spring	1.00
Surface Water Systems	Springs	Falmouth Spring	1.00
Surface Water Systems	Springs	GIL84971	1.00
Surface Water Systems	Springs	GIL94972	1.00
Surface Water Systems	Springs	GIL107971	1.00
Surface Water Systems	Springs	GIL107972	1.00
Surface Water Systems	Springs	GIL729971	1.00
Surface Water Systems	Springs	GIL1012971	1.00
Surface Water Systems	Springs	GIL1012973	1.00
Surface Water Systems	Springs	Ginnie Spring	1.00
Surface Water Systems	Springs	Grassy Hole	1.00
Surface Water Systems	Springs	Guaranto Spring	1.00

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**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Surface Water Systems	Springs	HAM610981	1.00
Surface Water Systems	Springs	HAM610982	1.00
Surface Water Systems	Springs	HAM610983	1.00
Surface Water Systems	Springs	HAM610984	1.00
Surface Water Systems	Springs	HAM612981	1.00
Surface Water Systems	Springs	HAM1023971	1.00
Surface Water Systems	Springs	HAM1023974	1.00
Surface Water Systems	Springs	Hart Spring	1.00
Surface Water Systems	Springs	Holton Spring	1.00
Surface Water Systems	Springs	Hornsby Spring	1.00
Surface Water Systems	Springs	ICH001C1	1.00
Surface Water Systems	Springs	ICH001C2	1.00
Surface Water Systems	Springs	ICH001C3	1.00
Surface Water Systems	Springs	ICH001C4	1.00
Surface Water Systems	Springs	ICH001C5	1.00
Surface Water Systems	Springs	ICH001C6	1.00
Surface Water Systems	Springs	ICH001C7	1.00
Surface Water Systems	Springs	ICH001C8	1.00
Surface Water Systems	Springs	Ichetucknee Spring	1.00
Surface Water Systems	Springs	July Spring	1.00
Surface Water Systems	Springs	LAF718971	1.00
Surface Water Systems	Springs	LAF718972	1.00
Surface Water Systems	Springs	LAF924971	1.00
Surface Water Systems	Springs	LAF929973	1.00
Surface Water Systems	Springs	Lilly Spring	1.00
Surface Water Systems	Springs	Lime	1.00

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**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Surface Water Systems	Springs	Lime Run Sink	1.00
Surface Water Systems	Springs	Little River Spring	1.00
Surface Water Systems	Springs	MAD610982	1.00
Surface Water Systems	Springs	MAD612981	1.00
Surface Water Systems	Springs	MAD612982	1.00
Surface Water Systems	Springs	MAD922977	1.00
Surface Water Systems	Springs	Mearson Spring	1.00
Surface Water Systems	Springs	Mill Pond	1.00
Surface Water Systems	Springs	Mission	1.00
Surface Water Systems	Springs	Morgan's Spring	1.00
Surface Water Systems	Springs	Nutall Rise	1.00
Surface Water Systems	Springs	Orange Grove	1.00
Surface Water Systems	Springs	Otter Spring	1.00
Surface Water Systems	Springs	Owens Spring	1.00
Surface Water Systems	Springs	Peacock Springs	1.00
Surface Water Systems	Springs	Perry	1.00
Surface Water Systems	Springs	Pickard	1.00
Surface Water Systems	Springs	Poe Spring	1.00
Surface Water Systems	Springs	Pot	1.00
Surface Water Systems	Springs	Pothole	1.00
Surface Water Systems	Springs	Rock Bluff Spring	1.00
Surface Water Systems	Springs	Rock Sink	1.00
Surface Water Systems	Springs	Rum Island	1.00
Surface Water Systems	Springs	Running Spring	1.00
Surface Water Systems	Springs	Ruth Spring	1.00
Surface Water Systems	Springs	Santa Fe Blue Spring	1.00

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**TABLE 4.1 (Continued)**  
**NATURAL RESOURCES OF REGIONAL SIGNIFICANCE**

Map Layer	Classification	Name	Acreage
Surface Water Systems	Springs	Santa Fe Rise	1.00
Surface Water Systems	Springs	Shingle	1.00
Surface Water Systems	Springs	Steinhatchee Rise	1.00
Surface Water Systems	Springs	Sunbeam	1.00
Surface Water Systems	Springs	SUW107971	1.00
Surface Water Systems	Springs	SUW923973	1.00
Surface Water Systems	Springs	SUW925971	1.00
Surface Water Systems	Springs	SUW1017972	1.00
Surface Water Systems	Springs	Suwanacoochee Spring	1.00
Surface Water Systems	Springs	Suwannee Spring	1.00
Surface Water Systems	Springs	Suwannee Blue Spring	1.00
Surface Water Systems	Springs	TAY625992	1.00
Surface Water Systems	Springs	TAY730991	1.00
Surface Water Systems	Springs	Telford Spring	1.00
Surface Water Systems	Springs	Trail Spring	1.00
Surface Water Systems	Springs	Troy Spring	1.00
Surface Water Systems	Springs	Turtle Spring	1.00
Surface Water Systems	Springs	Twin	1.00
Surface Water Systems	Springs	White Spring	1.00
Surface Water Systems	Springs	Wilson	1.00
Surface Water Systems	Springs	Withlacoochee Blue Spring	1.00

n/a = Not Applicable. An identification name or number is not provided as the natural resource is either located beyond the jurisdiction of the region, covers the entire region, or is adequately identified on the associated map without the need of a map identification name/number.

Source: North Central Florida Regional Planning Council, 2009.

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## 2. Coastal and Marine Resources

The region's coastline bordering the Gulf of Mexico extends approximately 80 miles from the Aucilla River, separating Taylor and Jefferson Counties, south to the Suwannee River which forms the boundary between Dixie and Levy counties. The environmental quality of the Gulf coast in Dixie and Taylor counties is generally excellent with few problems of regional significance. Salt marsh, broken only by rivers and their estuaries as well as a very few areas of beach, extends nearly the entire length of the coastline of Dixie and Taylor counties. Seaward of the salt marsh are the Big Bend Seagrass Beds. The seagrass beds provide an attractive environment for many commercially valuable fish and invertebrates. The Suwannee River is the largest coastal river in the region and forms a large estuary which supports large, commercially-viable, oyster beds.

The salt marsh, estuaries, coastal fresh water wetlands, as well as the Gulf itself all interact to provide fish and wildlife species with the elements required for their propagation, growth, and survival.<sup>5</sup> Identified coastal and marine natural resources of regional significance are the Big Bend Salt Marsh, the Big Bend Seagrass Beds, and the Florida Middle Ground.

### a. Big Bend Salt Marsh

Nearly the entire length of the Dixie and Taylor county coastline consists of salt marsh. The Big Bend Salt Marsh averages between one-half and one mile in width while penetrating several miles inland in some places, most notably at Shired Island and Horseshoe Cove where waters from the Suwannee River and California Swamp enter the Gulf.

Nutrients from the land and sea combine in the salt marsh to produce more biomass than some of the most intensively managed farms. It is a rich breeding ground for plant and animal life and is a primary nursery for commercially-valuable fish. Spotted sea trout, mullet, redfish and others spend much of their lives in the salt marsh. In addition, crabs, oysters, clams, shrimp, and other Gulf marine life depend on the salt marsh for food, protection, and propagation.

Other animal species found in the salt marsh include birds such as rails, egrets, gulls, terns, and seaside sparrows, all of which depend upon the salt marsh for food. The bald eagle breeds in several areas of salt marsh habitat. Besides the bald eagle, other listed species found in the Big Bend Salt Marsh include the diamond-back terrapin, salt marsh snake, mink, otter, and raccoon.<sup>6</sup>

The salt marsh is dependent for its existence upon an unrestricted flow of fresh water and sediments from coastal estuaries and sheet-flow runoff from fresh water coastal wetlands. Sand is an important ingredient in wetland building as it provides a stable platform in shallow water areas for marsh plant communities to develop. Once the flow of sand to the marsh is shut off, the forces of erosion and submergence take over.

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<sup>5</sup>Coastal fresh water wetlands are addressed under Surface Water Systems, beginning on page IV-47.

<sup>6</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.



## b. Big Bend Seagrass Beds

Three marine leagues seaward of land's end lies the limits of the jurisdiction of the state.<sup>7</sup> The area between land's end and the state's jurisdictional limit consists of salt marsh, oyster bars, as well as part of the Big Bend Seagrass Beds, which extend approximately 30 miles westward from land's end into the Gulf of Mexico to depths of 33 feet.<sup>8</sup> The seagrasses are comprised predominantly of *Thalassia testudinum*, *Halodule wrightii*, *Syringodium filiforme*, and *Halophilla eugolmannii*.

Similar to the salt marsh, the seagrass beds are an important community in terms of basic productivity. They provide habitat for many species of commercially-valuable invertebrate and fish. Submerged grass beds supply food to grazing animals, provide nutrients to the water, add oxygen, and stabilize sediments on the sea floor. The Big Bend Seagrass Beds are designated as both a State Aquatic Preserve and an Outstanding Florida Water. The beds are part of the second-largest area of continuous seagrasses in the eastern Gulf of Mexico.

The region has several small but growing coastal communities where development could, if not properly managed, adversely affect coastal resources. These include the town of Horseshoe Beach and the unincorporated communities of Steinhatchee, Suwannee, Keaton Beach, Cedar Island, and Dekle Beach. Population growth in coastal communities is likely to increase demand for access to coastal areas and resources.

Seagrass beds and coastal marshes can be adversely affected by channel dredging and associated spoils. Spoil deposition as well as the dredging process can deposit bottom muds on oyster beds and seagrass beds, causing their death through suffocation. Two areas of particular concern are the Keaton Beach - Cedar Island Channel near the mouth of Blue Creek and the Alligator Pass-Shark Channel at the mouth of the Suwannee River. The estuary at the mouth of the Suwannee provides a very important summer feeding and resting habitat for the endangered West Indian manatee. As a result, dredging activities have been confined to maintenance of existing channels only in West Pass.

Drilling activities have the potential for very high impacts on the seagrass beds.<sup>9</sup> Live bottoms, oyster beds, and seagrass beds may be at risk from drilling muds and cuttings discharge during drilling operations. Muds and cuttings deposited on top of coral, oysters, and seagrass can deprive these species of oxygen, causing them to suffocate. In addition, the ecology of the salt marsh may be severely disrupted by oil spills reaching such areas.

A study of the sensitivity of Florida's coastal environment corroborates these concerns. The study ranked the region's coastline as among the most environmentally sensitive in the state.<sup>10</sup> Environmentally

<sup>7</sup>Chapter 258.395, Florida Statutes.

<sup>8</sup>U.S. Department of the Interior, Minerals Management Service, Proposed 5-Year Outer Continental Shelf Oil and Gas Leasing Program, January 1987 - December 1991 Draft Environmental Impact Statement, Vol. 2, (1968), pp. IV.B.6.-31 and 32.

<sup>9</sup>Proposed 5-Year Outer Continental Shelf Oil and Gas Leasing Program January 1987- December 1991 Draft Environmental Impact Statement, pg. IV.B.6.-19.

<sup>10</sup>The Sensitivity of Coastal Environments and Wildlife to Spilled Oil in the North-Central Florida Region, Research Planning Institute, Inc., Columbia, S.C., 1984.

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sensitive fish and benthic invertebrate species found along the north central Florida coast include the eastern blue oyster, blue crab, stone crab, bay scallop, pink shrimp, white shrimp, rock shrimp, spotted sea trout, red drum, mullet, sheepshead, Atlantic sturgeon, Spanish mackerel, bluefish, spotfish, and pompano.

### c. Florida Middle Ground

The Florida Middle Ground is found between 47 and 66 miles southwest of the mouth of the Steinhatchee River in water depths of up to 125 feet. It consists of approximately 132,000 acres of coral reefs similar to those found in the Caribbean and represents the northernmost extent of coral reefs in the eastern Gulf of Mexico. Live bottom areas such as the Florida Middle Ground are of concern because of their biological productivity and their use as fish habitats.<sup>11</sup> The Florida Middle Ground is probably the best known and most biologically developed of the live bottom areas of the Gulf and has been designated as a Habitat Area of Particular Concern by the Gulf of Mexico Fishery Management Council.

Its considerable distance from shore and moderating currents attract fish normally found in the Caribbean-west Indies. The middle ground's transparent waters, shallow reef crests, irregular bottom topography, well-defined currents, and carbonate sediments attract many reef fishes which are either rare or absent at other west Florida shelf reefs. The dominant stony corals of the middle ground include *Madracis decactis*, *Porites divaricata*, *Dichochocoencia stellaris*, and *Dichochcencia stokesii*. Octocorals, a minor component of other Gulf reefs, are prominent. Dominant forms include *Muricea elongata* (orange Muricea), *Muricea laxa* (Dekucate muricea), *Eunicea calyculata* (warty Eunicea), and *Plexaura flexuosa* (sea rod).

Sport fishermen and recreational divers frequent the area despite its distance from the coast. Commercial fishermen also frequent the middle grounds since it is inhabited by red snapper and grouper. Although recognized by the regional plan as a Natural Resource of Regional Significance, the Florida Middle Ground is not mapped due to its location beyond the state's jurisdiction. Despite its location, the Council has commented, and will likely continue to comment, on environmental impact statements produced for proposed activities which could affect the Florida Middle Ground.

## 3. Groundwater Resources

Groundwater Natural Resources of Regional Significance consist of the Floridan Aquifer, sinks with direct connection to the Floridan Aquifer, stream-to-sink watersheds, and high recharge areas of the Floridan Aquifer.

### a. Floridan Aquifer

Three different aquifers underlie north central Florida, a surficial water table aquifer, an intermediate artesian aquifer, and the Floridan Aquifer. Of the three, only the Floridan Aquifer is recognized in the regional plan as a Natural Resource of Regional Significance. The Floridan Aquifer is one of the largest and most productive fresh water aquifers in the world and is the region's primary source of potable water.

<sup>11</sup>Proposed 5-Year Outer Continental Shelf Oil and Gas Leasing Program, January 1987 - December 1991 Draft Environmental Impact Statement, pp. IV.B.6.-31 and 32.



Underground limestone formations up to 5,000 feet thick exist within the region. However, the thickness of the permeable portion of the aquifer varies from approximately 600 to 1,700 feet. The potable portion of the aquifer increases in thickness from 250 feet near the coast to 1,250 feet in the northern portions of the region.<sup>12</sup>

The Floridan Aquifer can be divided into three classes. In Class I, the Floridan Aquifer is unconfined and is the sole source for groundwater supplies. In Class II, which may be thought of as a transitional area, a semi-artesian secondary system or water table aquifer overlies a semi-confined Floridan. In Class III, the Floridan Aquifer is confined. A water table aquifer and intermediate artesian aquifers overlay the Floridan. The aquifer ranges from Class III in the northeastern portion of the region where the aquifer is overlain by the Hawthorne Formation, through Class II which is roughly located in areas identified as High Recharge Areas of the Floridan Aquifer on the Groundwater Resources map, to Class I near the coastline. Generally, groundwater within the Floridan Aquifer moves from Class III to Class I areas (northeast to southwest).

#### i. Water Quantity of the Floridan Aquifer

Table 4.2 indicates that north central Florida has a much higher reliance on groundwater than the rest of the state. In 2000, 68.5 percent of all north central Florida water withdrawn for human use came from groundwater sources, compared with 25.2 percent statewide. Table 4.2 also reveals that north central Florida water consumption by type of user is similar to statewide usage. The region's reliance on groundwater sources is even higher than depicted in Table 4.2 as this table includes the one-time pass-through use of river water for cooling Florida Power Corporation's Suwannee River electrical generation station. When Suwannee County is excluded, groundwater comprises 97.8 percent of the water withdrawals of the remaining 10-county area.

<sup>12</sup>Water Management Plan, Suwannee River Water Management District, Live Oak, Fl., August 8, 1994, Review Draft, pp. 34-35.

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**TABLE 4.2  
WATER WITHDRAWALS BY SOURCE, 2000  
(MILLION GALLONS PER DAY)**

Area	Total Withdrawal		Withdrawal Source			
			Groundwater		Surface Water	
	Amount	Percent	Amount	Percent of Total	Amount	Percent of Total
<b>Alachua</b>	60.2	100.0	59.6	99.1	0.6	0.9
<b>Bradford</b>	5.9	100.0	5.8	99.0	0.1	1.0
<b>Columbia</b>	14.1	100.0	13.9	98.5	0.2	1.5
<b>Dixie</b>	3.5	100.0	3.5	99.2	0.0	0.9
<b>Gilchrist</b>	16.2	100.0	15.9	98.1	0.3	1.9
<b>Hamilton</b>	41.7	100.0	41.6	99.7	0.1	0.3
<b>Lafayette</b>	6.9	100.0	6.8	97.7	0.2	2.3
<b>Madison</b>	9.2	100.0	9.1	98.2	0.2	1.8
<b>Suwannee</b>	127.8	100.0	26.4	20.7	101.4	79.3
<b>Taylor</b>	49.8	100.0	46.8	93.9	3.0	6.1
<b>Union</b>	2.9	100.0	2.9	99.3	0.0	0.7
<b>Region</b>	338.2	100.0	232.2	68.6	106.1	31.4
<b>Florida</b>	20,146.4	100.0	5,082.5	25.2	15,065.1	74.8

Source: Florida Statistical Abstract, 2006, Table 8.41.

Most of the water used in the region is for commercial/industrial and power generation uses. However, these figures include water used for once-through cooling at the power plant, and water that is recycled several times at the PCS, Inc. phosphate plant in Hamilton county. The largest industrial user of water in the region is the Buckeye, Florida pulp mill in Taylor County with a 1990 average withdrawal of 46 million gallons per day.<sup>13</sup>

Table 4.3 presents the latest data reported in the Florida Statistical Abstract regarding groundwater withdrawals by type.

<sup>13</sup>Suwannee River Water Management District, 1996.

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**TABLE 4.3**  
**WATER USE: WATER WITHDRAWALS BY CATEGORY, 2000**  
**(MILLIONS OF GALLONS PER DAY)**

Area	All Water		Public (Fresh)	Domestic (Fresh)	Industrial (Fresh)	Water Used for Irrigation		Thermo-electric (Fresh & Saline)
	Total (Fresh & Saline)	Pct. of Total (Fresh)				Agriculture (Fresh)	Recreation (Fresh)	
<b>Alachua</b>	60.2	1.0	28.3	4.1	2.5	18.2	4.5	2.6
<b>Bradford</b>	5.9	1.0	1.4	1.9	1.3	1.0	0.3	0.0
<b>Columbia</b>	14.1	1.0	3.7	3.7	0.3	5.9	0.5	0.0
<b>Dixie</b>	3.5	1.0	0.7	1.0	0.3	1.6	0.0	0.0
<b>Gilchrist</b>	16.2	1.0	0.3	1.3	0.3	14.3	0.0	0.0
<b>Hamilton</b>	41.7	1.0	1.0	0.7	34.4	5.6	0.0	0.0
<b>Lafayette</b>	6.9	1.0	0.2	0.6	0.2	5.9	0.0	0.0
<b>Madison</b>	9.2	1.0	1.7	1.2	0.2	5.9	0.3	0.0
<b>Suwannee</b>	127.8	1.0	1.4	2.7	1.5	21.0	0.1	101.1
<b>Taylor</b>	49.8	1.0	1.7	1.0	45.1	1.9	0.1	0.0
<b>Union</b>	2.9	1.0	0.4	1.1	0.4	1.1	0.0	0.0
<b>Region</b>	338.2	1.0	40.5	19.4	86.4	82.5	5.7	103.7
<b>Florida</b>	20,146.4	0.5	2,436.8	198.7	563.3	3,923.0	411.7	12,614.1

Source: Florida Statistical Abstract 2006, Table 8.43

Table 4.4 reports water withdrawal information from Table 4.3 in percentage terms. As can be seen, 80.6 percent of north central Florida water withdrawals are used for industrial, agriculture, and thermo-electric uses. Only 17.7 percent of north central Florida water withdrawals are used for public and domestic uses. Agricultural use accounts for approximately 24.4 percent of the region's total 2000 water use, which is slightly higher than the statewide percentage of 19.5. Agricultural water uses are not routinely reported as agricultural water use metering is not required in north central Florida.



**TABLE 4.4**  
**WATER WITHDRAWALS BY CATEGORY, 2000**  
**PERCENT OF TOTAL**

Area	Total (Fresh & Saline)	Public (Fresh)	Domestic (Fresh)	Industrial (Fresh)	Water Used for Irrigation		Thermo- electric (Fresh & Saline)
					Agriculture (Fresh)	Recreation (Fresh)	
<b>Alachua</b>	100.0	47.0	6.8	4.2	30.2	7.4	4.4
<b>Bradford</b>	100.0	23.6	32.3	21.4	17.4	5.3	0.0
<b>Columbia</b>	100.0	26.0	26.5	2.4	41.8	3.2	0.0
<b>Dixie</b>	100.0	19.0	27.8	7.4	45.9	0.0	0.0
<b>Gilchrist</b>	100.0	1.7	8.2	1.6	88.5	0.0	0.0
<b>Hamilton</b>	100.0	2.3	1.8	82.4	13.5	0.0	0.0
<b>Lafayette</b>	100.0	2.9	8.8	2.9	85.4	0.0	0.0
<b>Madison</b>	100.0	17.9	13.3	1.6	64.4	2.8	0.0
<b>Suwannee</b>	100.0	1.1	2.1	1.2	16.4	0.1	79.1
<b>Taylor</b>	100.0	3.5	1.9	90.6	3.9	0.2	0.0
<b>Union</b>	100.0	12.3	37.5	13.7	36.5	0.0	0.0
<b>Region</b>	100.0	12.0	5.7	25.5	24.4	1.7	30.7
<b>Florida</b>	100.0	12.1	1.0	2.8	19.5	2.0	62.6

Source: Florida Statistical Abstract 2006, Table 8.43.

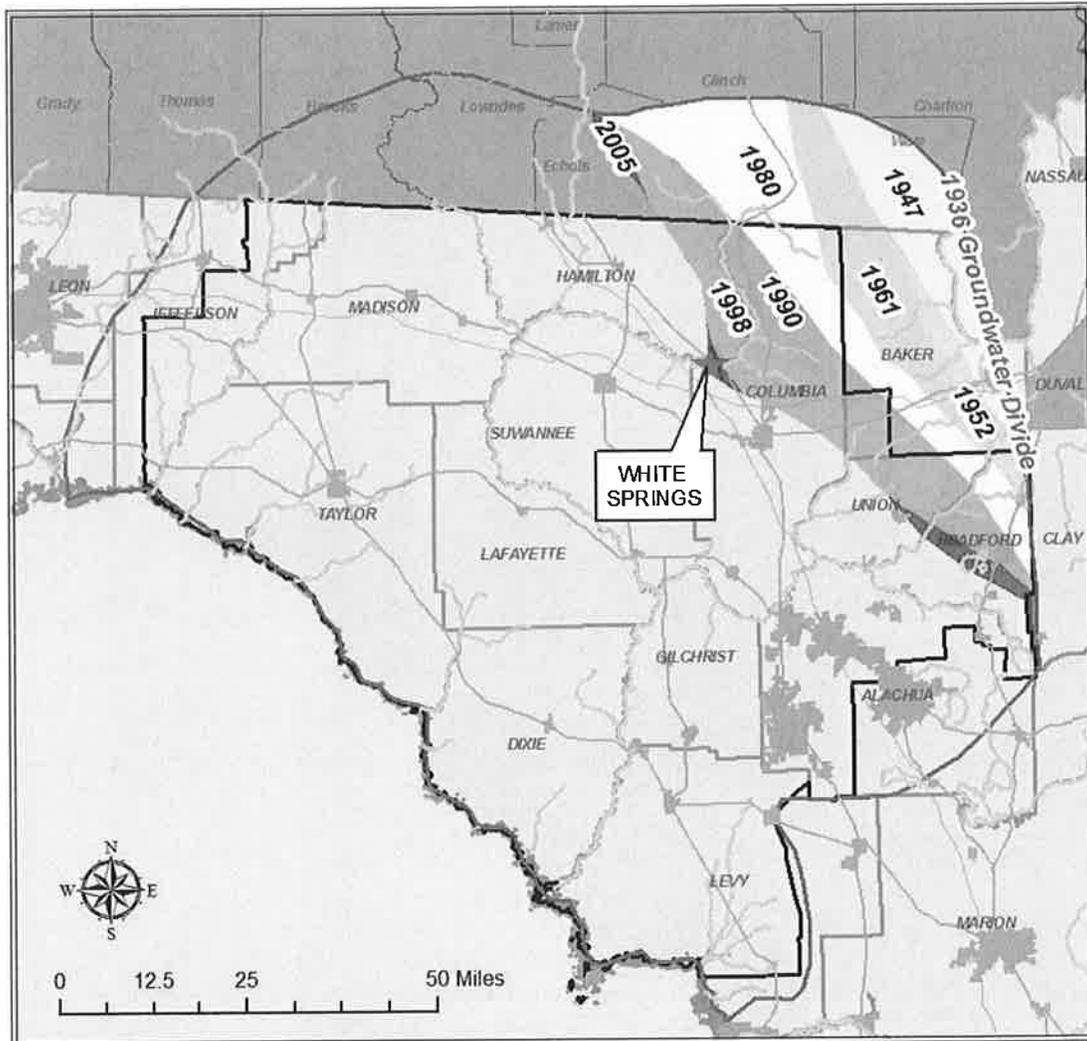
The 2010 Suwannee River Water Management District Water Supply Assessment notes that the water resources of the eastern and northeastern portions of the District are in decline and that this trend is especially evident in the potentiometric surface of the Upper Floridan Aquifer.<sup>14</sup> The Water Supply Assessment notes that a southwestern migration of the groundwater basin divide has occurred between 1936 pre-development conditions through 2005 (see Illustration 4.1). The Assessment notes that the divide has migrated more than 35 miles to the southwest during this time period. The result of the migration is a decrease in the size of the groundwater contributing area to the eastern portion of the Suwannee River Water Management District by more than 20 percent or 1,900 square miles.

<sup>14</sup>Water Supply Assessment: Water for Nature, Water for People, 2010, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, pg. 46.

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**ILLUSTRATION 4.1**  
**MIGRATION OF THE GROUNDWATER BASIN DIVIDE**



Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

The Assessment further notes that the decrease, "... is apparently a result of groundwater withdrawals originating in the District, the St. Johns River Water Management District, and the State of Georgia."<sup>15</sup> Illustration 4.2 depicts water demand projections through the year 2030 of the Southwest Florida Water Management District, the Northwest Florida Water Management District, southern Georgia, the Suwannee

<sup>15</sup>Water Supply Assessment: Water for Nature, Water for People, 2010, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, pg. 46.

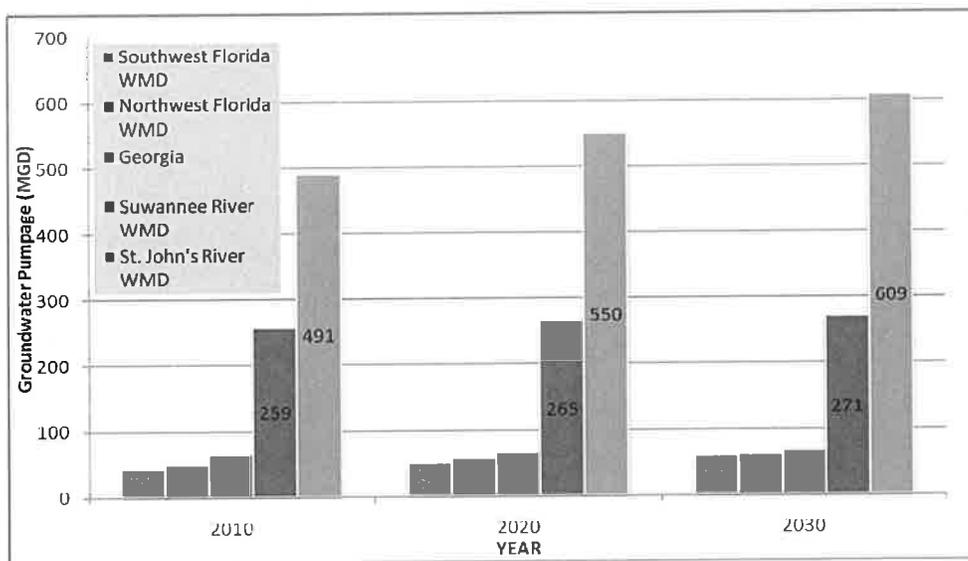
Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



River Water Management District and the St. Johns River Water Management District. The water withdrawals from these water management districts, as well as southern Georgia, are accounted for in a computer model used by the Suwannee River Water Management District and the St. Johns River Water Management District to identify groundwater impacts. The Assessment notes that, within the geographic area subject to computer modeling, the magnitude of groundwater withdrawals occurring in the St. Johns River Water Management District's northern-most nine counties "... is significantly larger than the withdrawals in the entire Suwannee River Water Management District."<sup>16</sup>

**ILLUSTRATION 4.2**

**NORTH FLORIDA MODEL AREA WATER DEMAND PROJECTIONS**



Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

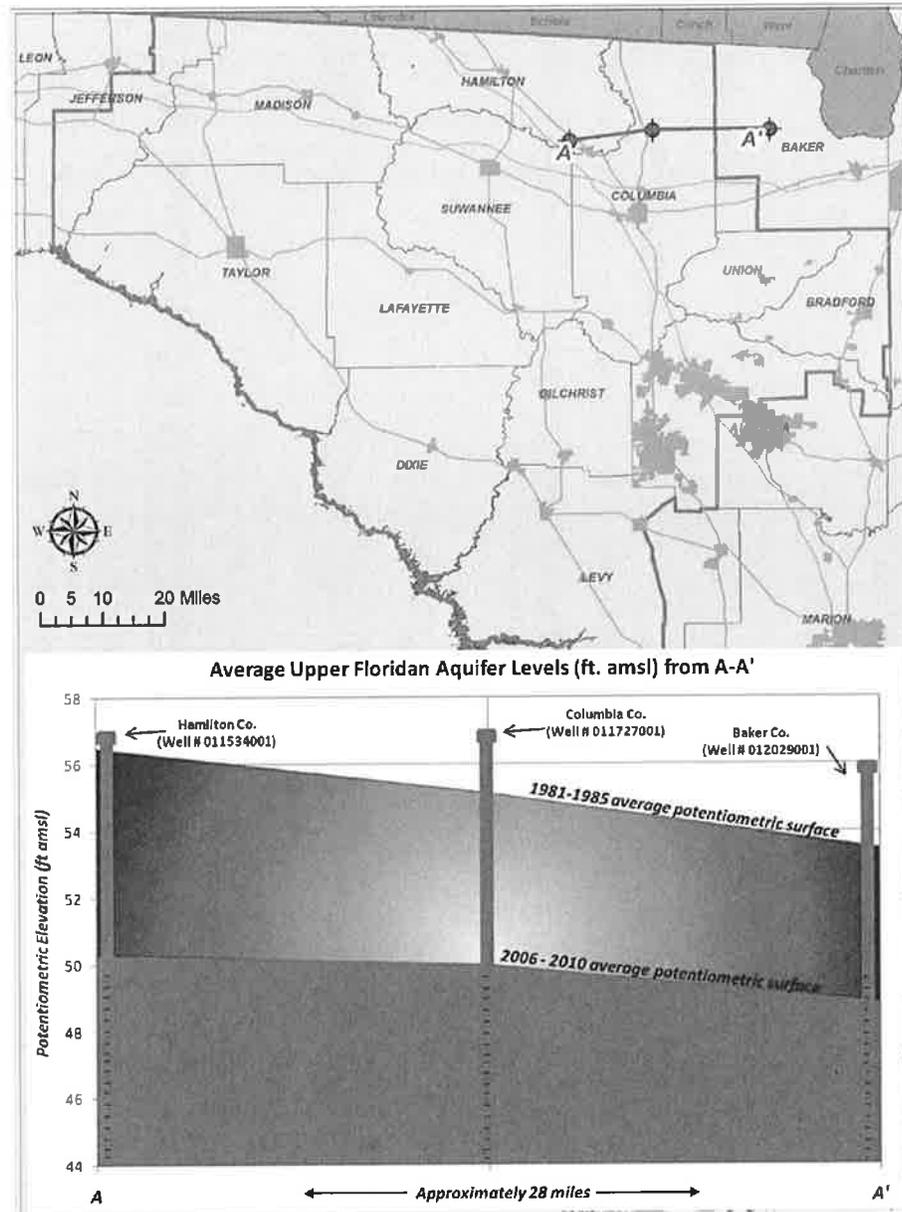
Illustration 4.3 depicts the magnitude of the decline in average potentiometric levels from 1981 to the present along a 28-mile cross-section through the Upper Floridan Aquifer.

<sup>16</sup>Water Supply Assessment: Water for Nature, Water for People, 2010, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, pg. 34.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**ILLUSTRATION 4.3**  
**POTENTIOMETRIC SURFACE DECLINE ACROSS SECTION A-A**



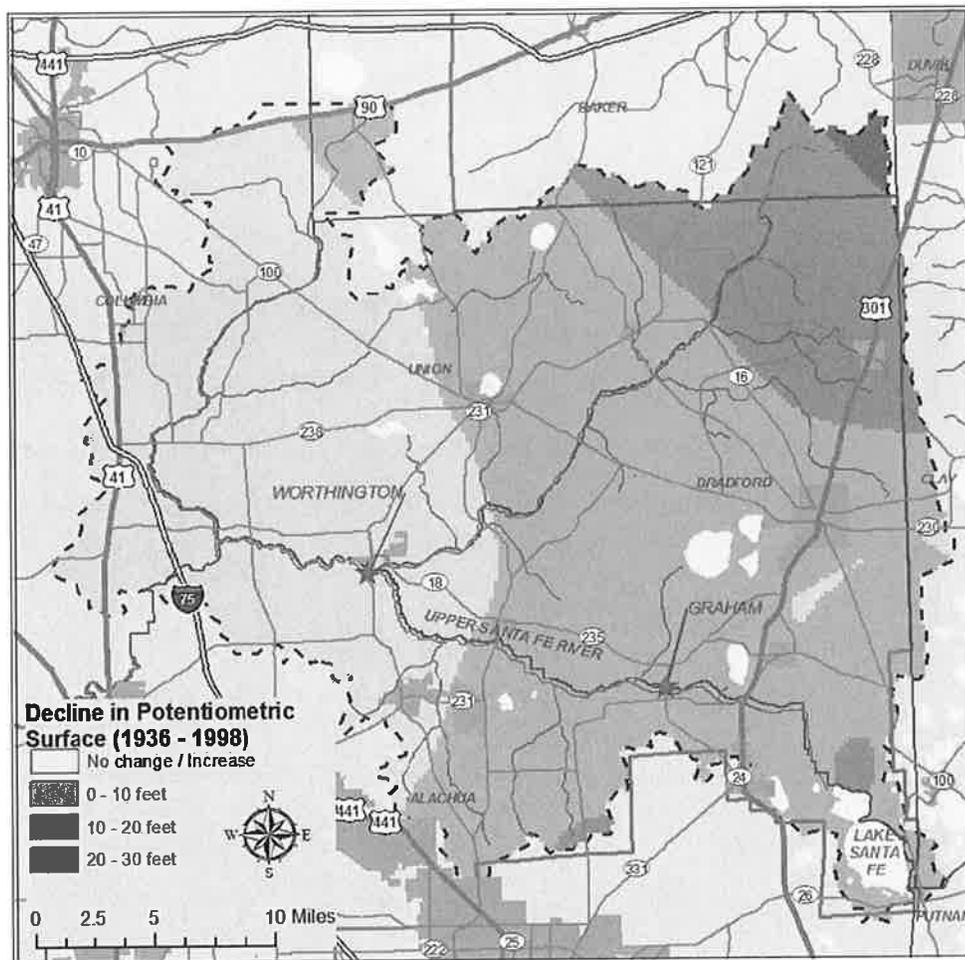
Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011

The Water Supply Assessment notes that Section A-A has experienced a cumulative drawdown of approximately six feet over a 29-year period. The Assessment further notes that this decline is in addition to significant a drawdown which occurred prior to 1981.<sup>17</sup> The drawdown is particularly notable in the Upper Santa Fe River Basin, as shown in Illustration 4.4, below.

**ILLUSTRATION 4.4**

**UPPER SANTA FE RIVER BASIN POTENTIOMETRIC SURFACE DECLINE FROM PRE-DEVELOPMENT THROUGH 1998**



Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

<sup>17</sup>Water Supply Assessment: *Water for Nature, Water for People, 2010*, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, pg. 48.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



The Water Assessment concludes that the decline in the potentiometric surface of the Floridan Aquifer in the northeastern portion of the Water Management District apparently has impacted a number of rivers, and springs to the degree that they are not currently meeting their established minimum flows and levels, or will not meet them at some point during the 20-year planning period of the Water Supply Assessment. More specifically, the Water Supply Assessment notes that the Aucilla River, a portion of the Suwannee River near White Springs, the Alapaha River, the Santa Fe River, Hornsby Spring, and Santa Fe Rise are anticipated to fall below their established minimum flows at some point by 2030.<sup>18</sup>

Subsection 373.042(2), Florida Statutes, requires water management districts to establish minimum flows and levels to protect surface waters. Minimum flows and levels represent the water level below which significant harm can occur to surface water bodies, be it to navigation, recreation, fish and wildlife, or fish and wildlife habitat. Once established, they are used as part of the water supply planning and permitting criteria for consumptive use permits issued by the districts. Essentially, water flows and levels which are above the minimum flow can be allocated for consumptive uses without significantly adversely impacting the water body from which the water is withdrawn.

The Water Supply Assessment recommends the creation of four Water Supply Planning Areas as depicted in Illustration 4.5 and associated Water Supply Plans. Designation as a Water Supply Planning Area can result in the area being classified by the Water Management District as a Water Resource Caution Area. A Water Resource Caution Area is an area where existing sources of water will not be adequate to satisfy future water demands and sustain water resources, including Natural Resources of Regional Significance. Future water users within Water Resource Caution Areas will be required to find water sources other than groundwater withdrawals from the Floridan Aquifer. Alternative water sources could include surface water from rivers, reclaimed water, brackish groundwater, and seawater. The Water Supply Assessment notes that water conservation is also considered to be an alternative water source even though it is a demand management method and not technically a source of water.<sup>19</sup>

Pursuant to Section 163.3177(4), Florida Statutes, within 18 months after the adoption of a Water Supply Plan, even if a Water Supply Area is not identified as a Water Resource Caution Area, local governments must amend their Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element to incorporate alternative water supply projects from those identified in the regional water supply plan. The element must identify such alternative water supply projects and traditional water supply projects and conservation and reuse necessary to meet the water needs identified in the Water Supply Plan.

The element must also include a work plan, covering at least a 10-year planning period, for building public, private, and regional water supply facilities, including development of alternative water supplies, which are identified in the element as necessary to serve existing and new development. The work plan must also include an estimate of the capital costs, as well as the operating and maintenance costs, of the listed projects, including the identification of possible funding sources.

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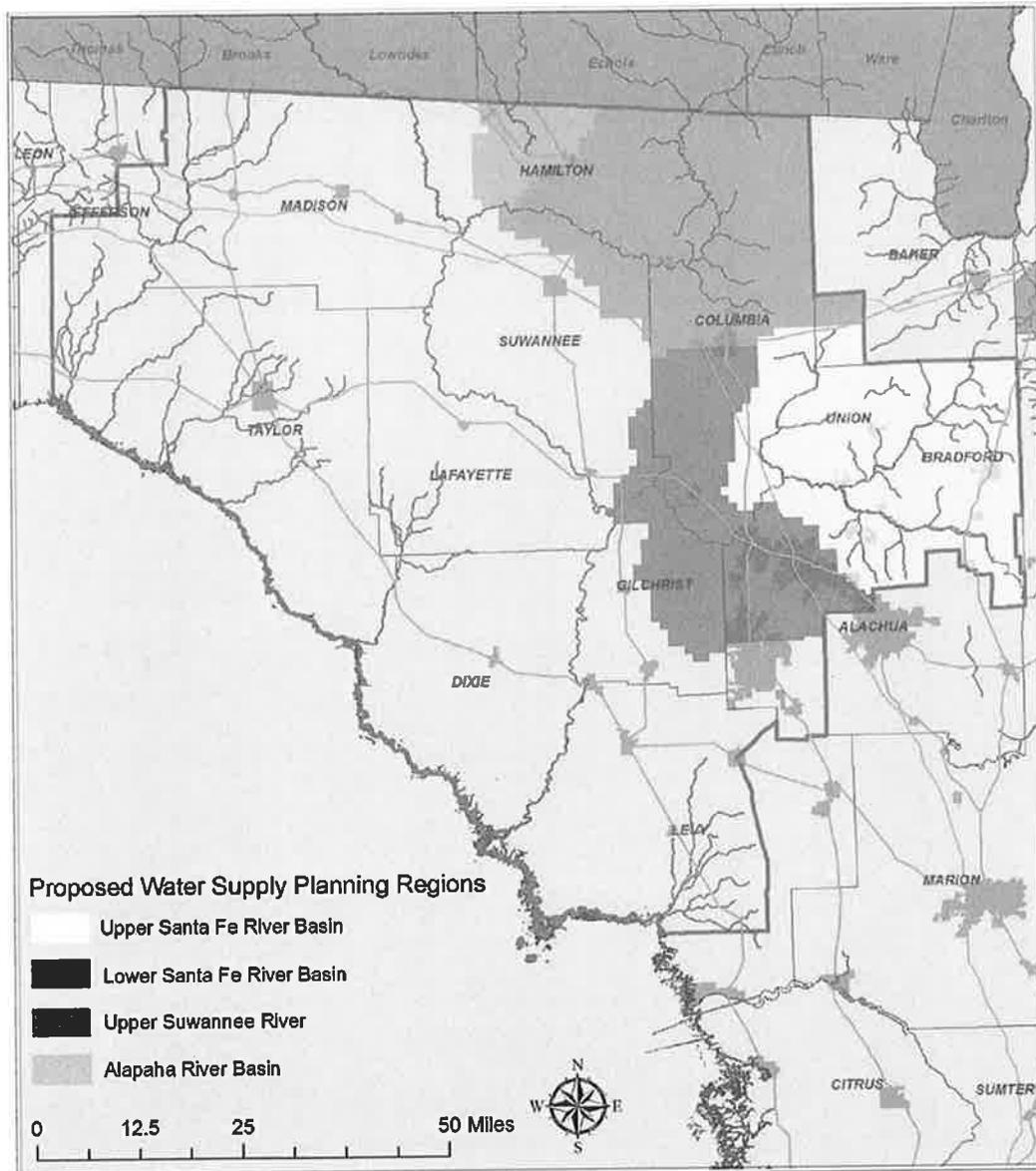
<sup>18</sup>Water Supply Assessment: Water for Nature, Water for People, 2010, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, ppg. 44 and 46.

<sup>19</sup>Water Supply Assessment: Water for Nature, Water for People, 2010, Suwannee River Water Management District, December 6, 2010, Live Oak, Florida, pg. 4.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**ILLUSTRATION 4.5**  
**PROPOSED WATER SUPPLY PLANNING REGIONS**



Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



## ii. Water Quality of the Floridan Aquifer

Generally, the water quality of that portion of the Floridan Aquifer which underlies north central Florida is excellent. North central Florida groundwater contamination is local in nature, consisting of point source discharges, underground storage tanks, landfills, storm water drainage wells, direct recharge from untreated storm water, and direct recharge from untreated intensive agricultural runoff.<sup>20</sup> The Floridan Aquifer is almost entirely contained within a bed of limestone. Rainfall, surface water, and surficial aquifer water is slightly acidic. As a result, the carbonate rock of the Floridan Aquifer is slowly dissolving. The dissolved rock appears as dissolved particles in the groundwater. Consequently, water from the Floridan Aquifer is relatively high in specific conductivity, alkalinity, magnesium, and calcium.<sup>21</sup>

The region's springs can also provide a useful measure of groundwater quality. Nitrate Nitrogen is present in Floridan Aquifer and can be measured from spring discharges. High concentrations of nitrates may create an imbalance in a natural surface water system, causing algal blooms or other adverse effects. Nitrate Nitrogen concentrations in excess of the state drinking water standard of 10 mg per liter of water can result in Methemoglobinemia (blue baby syndrome) in infants.

Table 4.5 identifies Nitrate Nitrogen concentration changes over time in the region's first-magnitude springs. As can be seen, six springs have experienced an increase in nitrate nitrogen, while 17 springs have experienced a decrease in nitrate nitrogen. Perhaps most noteworthy is the frequency of the sampling. Of the 26 springs identified in Table 4.5, two have not been sampled since 2005, seven have not been sampled since 2002 and an additional seven have not been sampled since 2001.

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<sup>20</sup>Suwannee River Water Management District, 1996.

<sup>21</sup>Draft Water Management Plan, Live Oak, Fl., August 8, 1994, pg. 35.



**TABLE 4.5**  
**NORTH CENTRAL FLORIDA FIRST MAGNITUDE SPRINGS:**  
**WATER QUALITY CHANGE OVER TIME**

Spring Name	County	Nitrate Nitrogen (Milligrams per Liter)	Date of Measure	Nitrate Nitrogen (Milligrams per Liter)	Date of Measure	Percent Change
<b>ALA 112971</b>	Alachua	0.80	5/26/98	.53	6/8/06	(33.75)
<b>Alapaha Rise</b>	Hamilton	0.24	9/25/97	.26	11/21/06	8.33
<b>Blue</b>	Lafayette	1.87	7/16/97	2.35	7/18/06	25.67
<b>Blue Hole</b>	Columbia	0.04	6/17/98	.74	7/31/05	1,750.00
<b>Blue Spring</b>	Madison	1.72	6/15/98	1.53	6/1/06	(11.05)
<b>COL61981</b>	Columbia	0.45	6/1/98	.25	6/8/06	(44.44)
<b>Columbia</b>	Columbia	0.76	5/26/98	.39	6/8/06	(48.68)
<b>Devil's Ear</b>	Gilchrist	1.47	11/4/97	2.0	7/14/05	36.05
<b>Falmouth Spring</b>	Suwannee	0.78	6/17/98	1.14	6/28/06	46.15
<b>GIL1012973</b>	Gilchrist	1.38	10/12/97	0.69	8/22/01	(50.00)
<b>Holton Spring</b>	Hamilton	0.40	9/25/97		no new information available	n/a
<b>Hornsby Spring</b>	Alachua	1.07	4/27/98	0.72	4/27/06	(32.71)
<b>Ichetucknee Group</b>	Columbia					
<b>ICH001C1</b>	Ichetucknee Springs Group	0.67	10/16/91	0.83	9/16/02	23.88
<b>ICH001C2</b>	Ichetucknee Springs Group	.85	6/10/92	0.70	6/25/02	(17.65)
<b>ICH001C3</b>	Ichetucknee Springs Group	.59	6/10/92	0.49	6/25/02	(16.95)

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**TABLE 4.5 (Continued)**

**NORTH CENTRAL FLORIDA FIRST MAGNITUDE SPRINGS:  
WATER QUALITY CHANGE OVER TIME**

Spring Name	County	Nitrate Nitrogen (Milligrams per Liter)	Date of Measure	Nitrate Nitrogen (Milligrams per Liter)	Date of Measure	Percent Change
<b>ICH001C4</b>	Ichetucknee Springs Group	0.57	6/10/92	0.45	6/25/02	(21.05)
<b>ICH001C5</b>	Ichetucknee Springs Group	0.46	6/10/92	0.32	6/25/02	(30.43)
<b>ICH001C6</b>	Ichetucknee Springs Group	1.45	6/17/98	0.88	6/25/02	(39.31)
<b>ICH001C7</b>	Ichetucknee Springs Group	0.50	6/16/98	0.40	6/25/02	(20.00)
<b>ICH001C8</b>	Ichetucknee Springs Group	0.71	6/16/98	0.57	6/25/07	(19.72)
<b>July</b>	Columbia	1.55	11/4/97	1.43	6/7/00	(7.74)
<b>Lime Run Sink</b>	Suwannee	0.70	5/14/98	0.48	7/19/00	(31.43)
<b>Nuttall Rise</b>	Taylor	0.08	7/6/99		no new information available	n/a
<b>Santa Fe Rise</b>	Columbia	0.78	5/26/98	0.25	5/22/00	(67.95)
<b>Steinhatchee Rise</b>	Taylor	0.03	7/6/99		no new information available	n/a
<b>Troy Spring</b>	Lafayette	2.68	7/7/99	2.36	7/16/06	(11.94)

n/a = not available.

Sources: [Springs of the Suwannee River Basin in Florida and Springs of the Aucilla, Coastal, and Waccasassa Basins in Florida](#), Suwannee River Water Management District, Live Oak, Florida. February, 2000; Suwannee River Water Management District unpublished data, May 2007; and Florida Department of Environmental Protection, May 2007.

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### iii. Impact of Stormwater on the Floridan Aquifer

Land use decisions and land management practices, particularly within high recharge areas and stream-to-sink watersheds, can have direct impacts upon both the quality and quantity of water contained within the Floridan Aquifer. Local government comprehensive plans and water management district surface water permitting regulations should ensure that adverse impacts resulting from development which does occur within high recharge areas and stream-to-sink watersheds are minimized.

Statewide stormwater management requirements began in 1982 with Chapter 17-25, Florida Administrative Code, rule requiring stormwater treatment. In 1983, the St. Johns River Water Management District adopted Chapter 40C-4, Florida Administrative Code, for regulation of stormwater quantity. In 1986 both St. Johns and Suwannee River Water Management Districts adopted rules for stormwater quality (40C-42 and 40B-4, Florida Administrative Code, respectively), which replaced Chapter 17-25, Florida Administrative Code, in their respective jurisdictions. Prior to the enactment of these rules, there were no uniform stormwater management guidelines. Development occurring in some north central Florida local governments prior to 1982 faced no storm water management requirements whatsoever. This created a situation whereby stormwater in many of the region's older development, contaminated with pollutants such as oil, pesticide, and fertilizer residues, flows untreated into the Floridan Aquifer through high recharge areas and stream-to-sink watersheds. Inadequately treated stormwater also pollutes several surface waters identified as Natural Resources of Regional Significance.

### b. Areas of High Recharge Potential to the Floridan Aquifer

The Floridan Aquifer is replenished by rainfall. Certain areas of the region, due to the characteristics of the underlying soils, geology, and depth to the Floridan Aquifer, recharge more groundwater to the Floridan Aquifer faster than other areas. Areas of potential high recharge found within the region, as identified by the St. Johns River and Suwannee River water management districts, are recognized by the regional plan as Natural Resources of Regional Significance.<sup>22</sup>

Generally, Areas of High Recharge Potential to the Floridan Aquifer run northwest-southeast band that is approximately 38 miles wide. High aquifer recharge areas occur in Alachua, Columbia, Dixie Gilchrist, Hamilton, Lafayette, and Madison counties. The regional plan identifies and maps 968,600.9 acres, 21.9 percent of the entire region, as areas of high recharge potential to the Floridan Aquifer a Natural Resource of Regional Significance.

Alachua County has undertaken a study to produce a more accurate map of high aquifer recharge areas. In its review of County Comprehensive Plan amendments in 2004, the Council indicated it was willing to accept the County high aquifer recharge map, once completed, in lieu of the high aquifer recharge map included in the regional plan. Therefore, the new County aquifer recharge map is recognized as a Natural Resource of Regional Significance and is used as a source map for the high aquifer recharge potential map

<sup>22</sup>The water management districts used different methods to determine areas of high recharge, resulting in apparent inconsistencies between high aquifer recharge areas near district boundaries. For the St. Johns River Water Management District, the regional plan considers areas identified by the district as recharging 12 inches or more of water annually as Areas of High Recharge Potential to the Floridan Aquifer. For the Suwannee River Water Management District, the regional plan considers areas identified by the district as "High" to be Areas of High Recharge Potential to the Floridan Aquifer.



included in the regional plan. Columbia County has also produced a new aquifer recharge map using the same methodology employed in the development of the new Alachua County map. Therefore, the new Columbia County aquifer recharge map is also recognized as a Natural Resource of Regional Significance and included in the regional plan in place of the Suwannee River Water Management District map.

#### i. Stream-to-Sink Watersheds

Stream-to-sink watersheds are drainage basins containing one or more sinkholes which, in some cases, have direct connection to the Floridan Aquifer. In a stream-to-sink watershed, surface water runoff usually finds its way to streams that, in turn, flow into a sinkhole. Identification and management of these areas is necessary to prevent chemicals, pollutants, and fertilizers from finding direct or near-direct access to the drinking water supply through surface water runoff. The regional plan recognizes six stream-to-sink watersheds as Natural Resources of Regional Significance. These are Norton Creek in Madison County, Sinking Branch in Hamilton County, Little River in Suwannee County, Indian Mound Swamp/South Falling Creek/Turkey Prairie in northwest Columbia County, the Cannon Creek/Columbia Rose Creek/Clay Hole Creek area in southern Columbia County, and Alachua Slough/Blues Creek/Burnett Lake/Mill Creek/Hammock Branch/North Alachua/Pareners Branch/Turkey Creek in northern Alachua and southern Columbia Counties.

#### ii. Ichetucknee Trace

Ichetucknee Trace is located immediately north of Ichetucknee Springs State Park. The trace represents an ancient river corridor of the Ichetucknee River which is now underground. The waters of this ancient underground river re-emerge in the springs contained in Ichetucknee Springs State Park. Topographic analysis and recent ink dye tracing studies indicate a well-defined and integrated drainage system beneath the Ichetucknee Trace and the headwater springs of Ichetucknee Springs State Park. The trace itself represents an area of high karst activity, approximately one-mile in width on both sides of the ancient stream bank from Ichetucknee Springs State Park northward to the corridor's intersection with the 75-foot elevation contour. The entire trace area is approximately 13 miles in length. The northern portions of the trace include Rose and Clay Hole creeks. The trace area immediately north of the park is locally referred to as "Swiss cheese" due to the many sinkholes and chimneys located in the area. The entire Ichetucknee Trace abounds with sinkholes, ancient springs, isolated wetlands, and other solution features. Much of the trace is heavily forested.

Investigations by the University of Florida Geology Department have confirmed the direct connectivity of Rose Creek to the Ichetucknee Springs, as well as the connectivity of at least one sinkhole in the trace lying between Rose Creek sink and the springs. Septic tanks associated with urban development as well as agricultural activities are a special concern regarding the impact on water quality of the underground flows and ultimately on the surface water quality of the headwater springs located in Ichetucknee River State Park.

#### iii. Sinks

Besides stream-to-sink watersheds and the sinks which drain them, four additional sinks and one sink group are identified as Natural Resources of Regional Significance. These include O'leno Sink in O'leno State Park, Devil's Millhopper in Devil's Millhopper State Geologic Site, Alachua Sink in Paynes Prairie State Preserve, Brooks Sink in Bradford County, and the Aucilla River Sinks in Taylor County. Three of these Natural Resources of Regional Significance are discussed in detail below.

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### Aucilla River Sinks

Aucilla River Sinks comprise a four-mile section of the Aucilla River sometimes referred to as the "natural bridge" or "sink area" where the river disappears and rises in many sinkholes. This unique geological feature combined with a variety of wildlife in a diverse forest setting combine to make the sinks area of the Aucilla River a Natural Resource of Regional Significance.

The entire sink area encompasses some 2,000 acres along the river's trace in Taylor and Jefferson Counties. The four-mile river segment contains at least 50 to 60 sinkholes.<sup>23</sup> Some are simply limestone chimneys only a few feet in diameter; many are several hundred feet across with an elongated shape. Many sinks have a distinct flowing current.

The origin of these sinkholes is likely due to a ceiling collapse of an underground limestone river channel. Throughout the area, limestone banks are evident along the borders of all the sinks, usually forming banks from three to ten feet above the water surface. During periods of high rainfall the entire area may flood with the river as well as the sinkholes overflowing their banks.

The area along the river trace is predominantly a hardwood hammock. The limestone formation near the surface effectively prohibits most pine tree growth along the immediate river trace area. Much of the surrounding forest is overgrown with a dense understory, but paths and trails are frequent and provide access to the sinks. The area is not well used as few people know of its existence. Approximately two-thirds of the area was recently purchased by the State of Florida through the Conservation and Recreational Lands program.

### Brooks Sink

Brooks Sink is located within a privately-owned pine forest approximately four miles east of the Town of Brooker in Bradford County. The natural character of the sink is similar to Devil's Millhopper. It is located in a small, well maintained area of natural vegetation within an eight square mile area of planted pine forest. The site is closed to the public. Although in the midst of an intensively managed pine forest, the immediate surroundings of the sink, approximately ten acres, have not been harvested.

The value of Brooks Sink lies primarily in its significance as a site for geologic study. The area is known for its excellent exposures of soil and rock strata, particularly of the Hawthorne Formation. The relatively small natural forest surrounding the sink contributes to the aesthetic appeal of the site.

The sink itself has almost sheer limestone banks lined with large oak and elm trees which occasionally fall into the sink. The walls are covered with a variety of mosses and ferns, and only on its south side do the banks have sufficient slope for trees and shrubs to grow partially into the basin. The sink is approximately 85 feet deep and 400 feet in diameter. A deep gully has been eroded into the southeast side of the sink draining some 600 acres of planted pines northeast of the sink. This channel has eroded deeply into the sides of the sink.

Almost every common pine species occurs here including slash, longleaf, and loblolly pine, as well as large oak, elm, and gum trees. The planted pine forest surrounding the sink area consists primarily of loblolly

<sup>23</sup>North Central Florida Regional Planning Council, Significant Natural Areas in Planning District Three, Gainesville, Fl., 1977, pg. 41.



pinus in various stages of maturity. The retention of natural vegetation around the sink greatly minimizes erosion. Common wildlife in the area include wild pig, deer, and rabbit. A variety of panfish have been caught in the sink but no other aquatic species have yet been identified.

#### Devil's Millhopper Geological State Park

The Devil's Millhopper is a large sinkhole located north of Gainesville in Alachua County. The bowl-shaped sink, one of the largest in the state, measures 500 feet across and approximately 120 feet deep. Currently owned and managed by the Florida Department of Environmental Protection, Division of Recreation and Parks, the Devil's Millhopper was purchased by the state in 1972.

The sinkhole displays a gradation of micro-ecosystems, each with its own biotic community. In addition to its unique ecological features, the exposed slopes of the sinkhole reveal a slice of Florida's fossil and geologic record. Although located in an area of rapid residential development, continued state ownership should buffer most adverse impacts caused by development.

## 4. Natural Systems

Natural Systems identified in the regional plan as Natural Resources of Regional Significance consist of the Regional Ecological Greenways Network, which is a subset of the Florida Ecological Greenways Network included in the legislatively-adopted Florida Greenways Plan administered by the Office of Greenways and Trails. The Florida Ecological Greenways Network consists of a statewide network of ecological hubs and linkages designed to maintain large-scale ecological functions including focal species habitat and ecosystem services throughout the state. Critical Linkages 1 Critical Linkages 2, Priority 1 and Priority 2 coverages identified in the Critical Lands and Waters Identification Project initiated by the Century Commission for Sustainable Florida are, collectively, the areas of the Florida Ecological Greenways Network with the highest state and regional significance and are therefore included in the Regional Plan as the Regional Ecological Greenways Network, a Natural Resource of Regional Significance.

The Florida Ecological Greenways Network aggregates various data which identify areas of ecological significance from the Florida Natural Areas Inventory, Florida Fish and Wildlife Conservation Commission, existing and proposed conservation lands, and other relevant data. The data were combined to identify large areas of ecological significance (ecological hubs), and a network of linkages and corridors connecting the hubs into a statewide system of hubs and corridors.

It is the intent of this plan to protect listed species and their associated habitats located within the Regional Ecological Greenways Network while, at the same time, allowing development and economic activity to occur within the Network to the extent that such development and economic activity does not significantly and adversely harm the function of the resource as an ecological greenway.<sup>24</sup>

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<sup>24</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.



## 5. Planning and Resource Management Areas

Planning and Resource Management Areas can more accurately be thought of as natural resource designations rather than the mapping of natural resources per se. Planning and Resource Management Areas recognized by the regional plan as Natural Resources of Regional Significance include privately- and publicly-owned conservation and resource-based recreation lands, and Surface Water Improvement Management waterbodies.

### a. Surface Water Improvement Management Waterbodies

The Surface Water Improvement Management Act was passed into law by the Florida Legislature, effective July 1, 1987. The purpose of the act is to restore and/or protect the quality of surface waters in the state and to provide an on-going planning and coordination mechanism to maintain surface water quality. The Legislature delegated the responsibility for evaluating, prioritizing, and developing management plans to the state's water management districts in cooperation with other state agencies and local governments.

The Suwannee River Water Management District has identified 18 north central Florida waterbodies as priority waters to be addressed through the program. Four north central Florida waterbodies are included in the St. Johns River Water Management District Surface Water Improvement Act priority list. The Suwannee River Water Management District has developed management plans for all 18 north central Florida waterbodies. The plans focus on identification of surface water quality problems, monitoring surface water quality trends, and promoting interagency coordination for addressing identified issues. All Surface Water Improvement Management Act waterbodies are recognized as Natural Resources of Regional Significance and are listed in Table 4.1.

### b. Private Conservation and Resource-Based Recreation Lands

Privately-owned conservation and resource-based recreation lands designated as Natural Resources of Regional Significance are lands owned by the Nature Conservancy and similar organizations. The Nature Conservancy often works in concert with government agencies to acquire public conservation lands. Typically, the Nature Conservancy will acquire the property from a private owner and sell to a government agency. This technique was successfully used in the early 1990s to enlarge the Osceola National Forest. The Nature Conservancy also played an intermediary role in the state's Big Bend Coastal Tract acquisitions. Currently, privately-owned conservation lands total to 2,640 acres in the region.

### c. Public Conservation and Resource-Based Recreation Lands

Publicly-owned lands used for conservation and resource-based recreation purposes include national forests, state parks and preserves, other state lands owned for conservation and resource recreation purposes, lands owned by water management districts, and a few county-owned properties. Mapped categories of publicly-owned conservation and recreation lands are Federal, State, Water Management District, and County.

A number of tracts of publicly-held lands are found in north central Florida. The regional plan identifies 550,363 acres of regionally significant public lands (and conservation easements), representing 12.6 percent of the region. So much north central Florida land is in public ownership that some north central



Florida county governments oppose additional public land acquisitions due to the resultant decline in the local tax base.

Every state park and preserve, and every national forest, wildlife refuge, and wilderness area has a management plan. The Council can, through its regional plan, provide input into the direction of future management plans prepared for such areas located within the region. Council input can help to coordinate the management plans for specific public lands with the policies of the regional plan. For example, recent Council emphasis on eco-tourism promotion may suggest a management plan place greater emphasis on recreational or environmental activities.

Publicly-owned lands recognized by the regional plan as Natural Resources of Regional Significance include Austin Cary Memorial Forest, Big Shoals State Forest, Big Gum Swamp National Wilderness Area, Big Bend Coastal Tracts, Devil's Millhopper State Geologic Site, Ichetucknee Springs State Park, Lower Suwannee River National Wildlife Refuge, Okefenokee National Wildlife Refuge, Osceola National Forest, O'leno State Park, Paynes Prairie State Preserve, Peacock Springs State Recreation Area, River Rise State Preserve, San Felasco Hammock State Preserve, St. Marks National Wildlife Refuge, Steven Foster State Folk Cultural Center, Suwannee River State Park, water management district lands including Lochloosa Forest, various tracts along the Suwannee River, as well as other holdings. Fifteen of these areas are highlighted below.

i. Austin Cary Memorial Forest

Comprising 2,076 acres, Austin Cary Memorial Forest is in northeastern Alachua County immediately north of Gum Root Swamp, a Natural Resource of Regional Significance. The forest is owned by the University of Florida and managed by the university's School of Forest Resources and Conservation.

ii. Big Bend Coastal Tracts

The Big Bend Coastal Tracts consist of approximately 81,158 acres on the coast in Dixie and Taylor counties, 4,389 acres of which comprise the Econfina River State Park. The tracts were purchased under the Conservation and Recreational Lands program in 1988 and 1990. The tracts were part of a larger acquisition intended to protect the low energy coastline of the Gulf of Mexico.

The area contains salt marsh, hydric hammock, mesic flatwoods, sandhills, upland hardwood forest, maritime hammock, and coastal swamp. Much of the drier sites have been converted to planted pine forest. The areas support excellent populations of wildlife. The tracts are adjacent to the Big Bend Seagrass Aquatic Preserve. Four wildlife management areas (Hickory Mound, Spring Creek, Tide Swamp, and Big Bend) are located within the tracts. The Big Bend Salt Marsh and Tide Swamp are discussed in greater detail on pages IV- 11 and IV-48, respectively.

iii. Big Gum Swamp National Wilderness Area

The Big Gum Swamp National Wilderness Area is located within the Osceola National Forest and is administered by the U.S. Forest Service. The area comprises 13,847 acres, of which 3,374 acres are in Columbia County. The remainder is located in Baker County and the Northeast Florida Regional Planning District. National wilderness areas differ from national forest lands in that no economic or mechanical activity may take place in wilderness areas. The land and wildlife must be left in its natural state.

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#### iv. Local Government Conservation Areas

Local government conservation areas designated as Natural Resources of Regional Significance consist of 16,229 acres. The parcels are located in Alachua, Columbia, and Suwannee counties as well as the Cities of Starke and Gainesville. The City of Starke property consists of 138 acres known as the Edwards Bottomland. The City of Gainesville owns and manages 21 separate properties consisting of 1,755 acres. The Columbia County property consists of the 968-acre Alligator Lake Park and Recreation Area as well as the 136-acre Falling Creek Park. The Alachua County property includes 27 separate holdings consisting of 13,155 acres either owned or managed by the County. The Suwannee County property consists of the 77-acre Suwannee River Greenway at Branford.

#### v. Ichetucknee Springs State Park

Ichetucknee Springs State Park consists of 2,525 acres along the Ichetucknee River. The park includes the head waters of the Ichetucknee River, which consists of a number of springs, including Ichetucknee Springs. The park was purchased by the state in 1970 and listed on the National Registry of Natural Landmarks in 1972. It is known for its clear water and is a very popular location for canoeing, rafting, and tubing.

The river bank ranges from high limestone outcrops to river swamp/marsh. Sandhills dominate the highest elevations in the park. The sandhill community comprises 30 percent of the park and has well-drained soil with an open canopy. Common plants include turkey oaks, sand post oak, longleaf pine, bracken fern, and wiregrass. Mesic hammock constitutes 65 percent of the park area. It is moderately drained and has a closed canopy consisting of mixed hardwoods including southern red oak, laurel oak, sweetgum, flowering dogwood, and sparkleberry. The park contains a small area of river swamp, which is poorly drained and frequently flooded with a dense canopy. The dominant plants of the river swamp are red maple, sweetgum, American elm, Florida ash, and bald cypress. Animals common to the park include beaver, turkey, limpkin, apple snail, Suwannee bass, gulf pipe fish, and river otter.

#### vi. Lower Suwannee National Wildlife Refuge

The Lower Suwannee National Wildlife Refuge comprises approximately 52,935 acres of coastal marsh, of which 28,634 acres are located in Dixie County. The remainder is in Levy County and the Withlacoochee Regional Planning District. Within Dixie County, the refuge starts eight miles south of Fanning Springs, continues southward along the Suwannee River to the unincorporated coastal community of Suwannee, and extends ten miles northward along the coast.

National wildlife refuges are created by Congress for the protection of migratory waterfowl and endangered species. They are owned or leased by the federal government and managed by the U.S. Fish and Wildlife Service. While economic activities may occur in a national wildlife refuge, the activity must not threaten the habitats of endangered species or migratory birds. It is common for selected timber harvesting or limited agricultural activities to occur in a wildlife refuge.

#### vii. Okefenokee National Wildlife Refuge

The Okefenokee National Wildlife Refuge consists of 396,000 acres, a small portion of which is adjacent to the northeast corner of Columbia County. The bulk of the refuge is in Georgia. The refuge is located approximately four miles north of the Osceola National Forest. The Nature Conservancy is slowly

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purchasing land between the Osceola National Forest and the Okefenokee National Wildlife Refuge in an effort to link the two federal holdings for purposes of wildlife preservation.

#### viii. O'leno State Park and River Rise Preserve State Park

O'leno State Park and River Rise Preserve State Park are adjacent state land holdings encompassing 6,200 acres along the Santa Fe River. O'leno State Park is on the Columbia County side of the river while River Rise Preserve State Park is located on the Alachua County side. The Santa Fe River enters the O'leno State Park at its northeast corner and proceeds in a southwesterly direction through the property. Similar to the Aucilla River, the Santa Fe River disappears within in an area known as the river sink. The river travels approximately three miles underground before reappearing in the highly scenic area known as the river rise. The area between river sink and river rise is known as the natural bridge.

The area has significant historical interest. The northern portion of the property is traversed by the Old Bellamy Road which was authorized by Congress in 1824 to link the east and west coasts of Florida. The Bellamy Road was the second federal road in the nation. An abundance of chert artifacts adds to the archaeological value of the area. Chert, also known as flint or flintrock, was used by American Indians in the manufacture of axe heads, spear heads, and arrow points.

Major plant communities within the park and preserve are sandhill, mesic hammock, bottomland hardwood swamp, and sandy scrub. Dominant species of the sandhill community include longleaf pine and loblolly pine. Other sandhill species include turkey oak and wiregrass. Dominant plant species in the mesic hammock community include the live oak, laurel oak, pignut hickory, and swamp chestnut oak with the sub-canopy made up of hollies, many shrubs, and wildflowers.

Areas of sandy scrub are found on the natural levees and the floodplain along the river. Due to a lack of nutrients and dry soil conditions, trees growing here seldom attain great height. Plant species include sand live oak, chapman oak, and extensive areas of saw palmetto. Woody swamp borders much of the river and is inundated at least part of the year. Plant species in the swamp area include bald cypress, river birch, red maple, American hornbeam, and black gum. Animals found in the park include fox squirrel, gopher tortoise, red tail hawk, indigo snake, pine snake, rufus-sided towhee, alligator, river otter, wood duck, white ibis, whitetail deer, opossum, raccoon, wild turkey, and pileated woodpecker.

#### ix. Osceola National Forest

Osceola National Forest consists of 198,484 acres, 109,247 acres of which are in northwest Columbia County. The remainder of the forest is outside the region in Baker County and in the Northeast Florida Regional Planning District. Osceola National Forest is the largest federal government land holding in the region. Most of the forest consists of forested wetlands. The higher, better-drained areas are in the southern half of the property. The forest is covered by pine flatwoods with longleaf pine predominating the western one-third and slash pine predominating the eastern two-thirds of the forest. The most common understory includes saw palmetto and gallberry. Runner oak and wiregrass are the most common ground cover. Cypress is the second most-common tree type in the Forest. Blackgums, red bay, red maple, and holly accompany the bald cypress and pond cypress. Creek swamps featuring sweetbay, blackgum, and red maple occupies about 12 percent of the forest. A variety of wildflowers can be found throughout.

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Osceola National Forest holds a variety of wildlife and fish. Game animals include white-tailed deer, black bear, wild turkey, quail, rabbit, squirrel, and dove. Non-game species include more than 50 species of fish, 40 species of amphibians, 60 species of reptiles, 180 species of birds, and 48 species of mammals.<sup>25</sup> The red-cockaded woodpecker, Florida sandhill crane, American alligator, indigo snake, and Suwannee bass are among the listed species found within the forest.<sup>26</sup>

The National Forest Management Act of 1976 designates the U.S. Forest Service as the management agency for national forest lands. Under the act, the U.S. Forest Service is mandated to produce a continuous supply of goods and services from national forest lands. Goods and services are limited to timber, wildlife, water, forage, minerals, outdoor recreation, and soil conservation. Essentially, any activity detrimental to these items is prohibited in national forest lands. The National Environmental Policy Act of 1976 requires the preparation of an Environmental Impact Statement for major projects proposed in national forests.

The forest is extensively used for timber production and contains economically valuable phosphate deposits. Exploratory drilling during the late 1960s indicated a high quality reserve in excess of 100 million tons. There may also be some potential for oil and gas reserves, but limited exploration has shown no deposits. In 1984, the federal government prohibited oil, gas, and mineral extraction from the Osceola National Forest.

#### x. Paynes Prairie Preserve State Park

Encompassing approximately 21,657 acres in southeastern Alachua County, Paynes Prairie was acquired as part of Florida's state parks and preserves system in 1973. State preserves differ from state parks as they are established primarily to protect natural wildlife and habitat. Access is limited when necessary to prevent adverse environmental damage. State parks are generally more accessible and emphasize outdoor recreation and camping activities. The prairie is intermittently flooded and receives surface water runoff from the City of Gainesville. The quality of surface water runoff to the prairie is of particular concern as the prairie has direct access to the Floridan Aquifer via Alachua Sink.

The major plant community of the prairie is marsh. The depth of water governs plant species and several vegetative zones can be found from the dry prairie edge to the deep water in the center of the prairie. Dog fennels, maiden cane, pickerel weed, cattails, and spatterdock occupy the dry zone. Woody plants such as coastal plain willow, wax myrtle, elderberry, and persimmon have invaded the prairie along its artificial dikes.

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<sup>25</sup>Final Environmental Impact Statement for National Forests in Florida Land Resource Management Plan, U.S.D.A. Forest Service, Southern Region, Tallahassee, FL, December 1985, pg. III-13.

<sup>26</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.



Paynes Prairie is famous as a wildlife and waterfowl habitat. The abundance and diversity of animal life in the prairie has been well known since it was first described by explorer-naturalist William Bartram in 1784. Deer, otter, muskrat, alligator, and raccoon exist in the prairie along with many birds, including herons, egrets, ibises, ducks, and bobwhites. Listed species inhabiting the prairie include wood stork, Florida sandhill crane, and American kestrel.<sup>27</sup>

Paynes Prairie, despite its size, does not include the prairie's entire ecosystem. The state Department of Environmental Protection is concerned about development on the fringe of the prairie and would like to expand its boundaries. An area of land on the northeast side of the preserve is proposed for purchase under the Conservation and Recreation Lands program to link the preserve with Prairie Creek and Newnans Lake.

#### xi. Peacock Springs Conservation Area

Peacock Springs State Recreation Area is located ten miles southwest of Live Oak adjacent to the Suwannee River in Suwannee County. The area was recently purchased by the state through the Conservation and Recreational Lands Program. The area is an exemplary natural ecosystem containing elements of statewide and regional significance. The area encompasses excellent examples of surface and subsurface karst limestone features, including sizeable sinks, many smaller sinks, and depressions. It has one of the most extensive underwater cave systems in the continental United States and contains a total of 28,000 feet of explored and surveyed underwater passages.<sup>28</sup> The underwater cave system is widely regarded as one of the best underwater cave diving areas in the United States. In addition, the property has important archeological value as an early Spanish mission site.

The sinks and associated aquatic cave system provide critical habitat for at least three listed species of cave crustaceans endemic to Florida.<sup>29</sup> The area also contains mature, second-growth and old-growth forest stands.

#### xii. St. Marks national wildlife refuge

The St. Marks National Wildlife Refuge comprises approximately 68,000 acres, of which 1,284 acres are in Taylor County on the Gulf of Mexico adjacent to the Aucilla River. The remaining acreage is located in Jefferson and Wakulla Counties in the Appalachian Regional Planning District.

#### xiii. San Felasco Hammock Preserve State Park

San Felasco Hammock is located in the center of Alachua County between the cities of Gainesville and Alachua. The hammock has the most fertile soil on the Florida peninsula and is the last large remaining

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<sup>27</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, *Florida Administrative Code*; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, *Florida Administrative Code*, or an animal or plant species designated as Endangered or Threatened in Title 50, *Code of Federal Regulations*, Part 17.

<sup>28</sup>J. Merrill Lynch, *Suwannee River Preserve Design Project*, The Nature Conservancy, Tallahassee, FL., 1984, pg. 119.

<sup>29</sup>Florida Fish and Wildlife Conservation Commission, loc. cit.



example of hardwood hammock in the region. San Felasco Hammock has many steep slopes, ravines, sinkholes, ponds, scattered swamps, and sand ridges. It contains virtually every species of plant and animal native to Alachua County. In addition, the hammock recharges to the Floridan Aquifer. Surface water runoff is transported into the hammock via Turkey Creek and Blue's Creek. San Felasco Hammock was purchased by the state in 1972.

The hammock comprises approximately 7,192 acres of wild forest land with some pasture land on its northern edge. Most of the forest has been selectively logged during the 20 years prior to its purchase by the state. The selective cutting does not appear to have caused any permanent damage.

#### xiv. Suwannee River State Park

Located 14 miles west of Live Oak and 15 miles east of the City of Madison, Suwannee River State Park features the confluence of the Suwannee and Withlacoochee rivers. The park comprises approximately 1,994 acres of open pine sandhills, rich hardwood hammocks, and dense river swamps. The banks of the Suwannee have striking exposed walls of limestone outcroppings where the river has cut through the underlying rock.

Typical plants found in the sandhill community include longleaf pine, turkey oak, blue jack oak, and wiregrass. Sandhills are relatively high rolling prairies populated with pine trees. They are places of expansive openness, with wide spacing between the trees and a grassy ground cover. Original explorers of the area found miles upon miles of open sandhills with virgin longleaf pines towering above them. Most have been logged and cleared or left to succeed into hardwoods through the exclusion of natural fire. Sandhills are fire dependent, and constitute a fire-climax community where they appear. Wildlife found in sandhills include fox squirrel, gopher tortoise, red-tail hawk, indigo snake, pine snake, fence lizard, quail, rufous-sided towhee, and red cockaded woodpecker.

Hardwood hammock is an important Florida forest type. It is considered the climax forest of the southeastern coastal plain. Due to heavy logging and clearing, very few sizeable areas of hardwood hammock remain in Florida. Wildlife species dependent on hardwood hammock are diminishing. Suwannee River State Park provides a rich habitat for a wide variety of wildlife dependent upon hardwood hammock including bobcat, deer, turkey, gray squirrel, river otter, pileated woodpecker, wood duck, alligator, white ibis, cottonmouth moccasin, turtles, and a variety of songbirds.

#### xv. Water Management District Conservation Areas

Water management districts have acquired approximately 153,756 acres of land in the region. The districts have also acquired conservation easements on an additional 93,064 acres of otherwise privately-held lands within the region. While the protection of surface water quality is one of the major reasons for water management district acquisitions, many other benefits are provided by these lands. The two primary sources of funds for water management district land acquisitions are the Save Our Rivers Act and the Preservation 2000 Act. The Save Our Rivers legislation created the Water Management Lands Trust Fund for acquiring "lands necessary for water management, water supply, and the conservation and protection of water resources..." The Preservation 2000 Act directs that acquisitions should be "planned so as to protect the integrity of ecological systems and provide multiple benefits, including preservation of fish and wildlife habitat, recreational space, and water recharge areas." Most of the land acquired by the Suwannee River Water Management District is located within the 100-year floodplain of the Suwannee River and its tributaries. The St. Johns River Water Management District owns a portion of Lochloosa Wildlife

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Conservation Area in southeast Alachua County. Water management districts continue to receive state funding for land acquisition through the Water Management Lands Trust Fund and Preservation 2000. The districts continue to add to their holdings.

## 6. Surface Water Systems and Surface Water Quality

The region contains a rich assortment of lakes, springs, and wetlands. The headwaters of several rivers are found in the region. The headwaters of other rivers that flow through the region, such as the Suwannee, Alapaha, and Withlacoochee, are located in Georgia. Overall, the quality of surface waters is good. The regional plan identifies ten lakes, 11 river corridors, 57 springs, and 13 wetlands as Natural Resources of Regional Significance.

### a. Surface Water Quality

According to the 1998 Suwannee River Basin Surface Water Quality Report, the overall water quality of the Suwannee River basin, and the water quality of surface waters listed as Natural Resources of Regional Significance, is good, with a few localized exceptions.<sup>30</sup> The report notes that in many respects, water quality has improved in the basin from conditions which existed in the 1960s and 1970s, when numerous point sources of pollution discharged wastes to the Suwannee River and its tributaries. The report notes that contamination from agricultural and urban runoff are priority water quality management issues. Nutrients, primarily nitrate nitrogen, are the primary concern.<sup>31</sup>

In 1995, 19 of the region's 33 incorporated municipalities had centralized sewer systems. While the unincorporated community of Suwannee has since added a centralized wastewater system, no incorporated north central Florida municipality has converted to a centralized wastewater treatment system since. The Suwannee River Water Management District commissioned a 1998 study entitled Quality Communities Needs Report to identify the needs of north central Florida communities for improvements to their wastewater treatment, systems, potable water systems, stormwater management systems. The study notes that Fanning Springs, Archer, Lee, Steinhatchee, and the Dekle Beach - Keaton Beach area of Taylor County are in need of either a centralized wastewater treatment system or feasibility studies to determine the cost-effectiveness of the installation of a centralized wastewater treatment system.

Table 4.6 below identifies 14 surface water Natural Resources of Regional Significance with a fish consumption advisory issued by the Florida Department of Health. All of the fish consumption advisories are due to excessive levels of mercury in the identified fish species. No fish consumption advisories are in effect in north central Florida due to dioxin, pesticide or saxitoxin contamination.<sup>32</sup> Although not included as a regional indicator in 2002, a No Consumption Advisory was in effect for all fish caught in the Fenholloway River due to dioxin contamination. As of 2006, the Fenholloway River fish consumption

<sup>30</sup>David Hornsby and Marvin Raulston, Suwannee River Basin 1998 Surface Water Quality Report: Florida and Georgia, Suwannee River Water Management District, Live Oak, Florida, 2000, page 8.

<sup>31</sup>Hornsby and Raulston, page 35.

<sup>32</sup>Saxitoxin is a neurotoxin found in algae. It is also found in Puffer fish caught in Indian River Lagoons and from waterbodies in Volusia, Brevard, Indian River, St. Lucie and Martin Counties. None of these waterbodies are located in north central Florida.



advisory had been limited to Bowfin fish for mercury contamination. Additionally, the 2006 advisory recommends limiting the consumption of Bowfin fish from the Fenholloway River to no more than 1 fish per month for women of childbearing age and children.

New criteria for fish advisories for the general population were adopted in 2006. The Florida Department of Health also started listing information for any water body that had been tested and no longer included "Unrestricted Consumption" as a recommendation. The highest rate of consumption included in the recommendations is "two meals per week." The two meals per week limitation is used since it meets the American Heart Association recommendation in the Healthy Heart Diet and there was growing evidence that people who consumed excessive amounts of seafood, some as high as 21 meals per week, could result in mercury poisoning in adults.

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**TABLE 4.6**

**2006 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES**

Location	Largemouth Bass	Women of Childbearing Age and Children - # of Meals per Month	Black Crappie	Women of Childbearing Age and Children - # of Meals per Month	Bluegill	Women of Childbearing Age and Children - # of Meals per Month	Brown Bullhead	Women of Childbearing Age and Children - # of Meals per Month
<b>Alapaha River</b>	yes	1					yes	1
<b>Aucilla River</b>	yes	1						
<b>Econfina River</b>								
<b>Fenholloway River</b>								
<b>Lake Butler</b>			yes	4	yes	4		
<b>Lake Lochloosa</b>	yes	1						
<b>Lake Sampson</b>	yes	1	yes	1	yes	4		
<b>Lake Santa Fe</b>	yes	1						
<b>Newnans Lake</b>	yes	1	yes	4	yes	4	yes	4
<b>Orange Lake</b>	yes	1	yes	4	yes	8		
<b>Santa Fe</b>	yes	1					yes	1
<b>Steinhatchee River</b>	yes	1						
<b>Suwannee River</b>	yes	1					yes	1
<b>Withlacoochee River</b>	yes	1					yes	1
<b>Total</b>	11		4		4		5	

See note at end of table.

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TABLE 4.6 (Continued)

2006 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES

Location	Bowfin	Women of Childbearing Age and Children - # of Meals per Month	Chain Pickerel	Women of Childbearing Age and Children - # of Meals per Month	Channel Catfish	Women of Childbearing Age and Children - # of Meals per Month	White Catfish	Women of Childbearing Age and Children - # of Meals per Month
<b>Alapaha River</b>	yes	1			yes	1	yes	4
<b>Aucilla River</b>	yes	1						
<b>Econfina River</b>								
<b>Fenholloway River</b>	yes	1						
<b>Lake Butler</b>								
<b>Lake Lochloosa</b>	yes	1						
<b>Lake Sampson</b>	yes	1	yes	1				
<b>Lake Santa Fe</b>	yes	1						
<b>Newnans Lake</b>	yes	1						
<b>Orange Lake</b>	yes	1						
<b>Santa Fe</b>	yes	1			yes	1	yes	4
<b>Steinhatchee River</b>	yes	1						
<b>Suwannee River</b>	yes	1			yes	1	yes	4
<b>Withlacoochee River</b>	yes	1			yes	1	yes	8
<b>Total</b>	12		1		4		4	

See note at end of table.

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**TABLE 4.6 (Continued)**

**2006 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES**

Location	Gar	Women of Childbearing Age and Children - # of Meals per Month	Redbreast Sunfish	Women of Childbearing Age and Children - # of Meals per Month	Redeersunfish	Women of Childbearing Age and Children - # of Meals per Month	Spotted Sunfish	Women of Childbearing Age and Children - # of Meals per Month	Warmouth	Women of Childbearing Age and Children - # of Meals per Month
<b>Alapaha River</b>	yes	1	yes	4	yes	4				
<b>Aucilla River</b>	yes	1	yes	1			yes	1		
<b>Econfina River</b>			yes	1			yes	1		
<b>Fenholloway River</b>										
<b>Lake Butler</b>					yes	4				
<b>Lake Lochloosa</b>	yes	1								
<b>Lake Sampson</b>	yes	1			yes	4				
<b>Lake Santa Fe</b>	yes	1								
<b>Newnans Lake</b>	yes	1								
<b>Orange Lake</b>	yes	1			yes	8			yes	4
<b>Santa Fe</b>	yes	1	yes	4	yes	4				
<b>Steinhatchee River</b>	yes	1	yes	1			yes	1		
<b>Suwannee River</b>	yes	1	yes	4	yes	4				
<b>Withlacoochee River</b>	yes	1	yes	4	yes	4				
<b>Total</b>	11		7		7		3		1	

Note: yes= Fish consumption advisory issued.

Source: Your Guide to Eating Fish Caught in Florida, Florida Department of Health, 2006.

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## b. Total Maximum Daily Loads

Section 303(d) of the federal Clean Water Act requires states to submit lists of surface waters that do not meet applicable water quality standards (impaired waters) after implementation of technology-based effluent limitations, and establish Total Maximum Daily Loads for these waters on a prioritized schedule. Total Maximum Daily Loads establish the maximum amount of a pollutant that a water body can assimilate without causing violations of water quality standards. Florida submitted a list of Total Maximum Daily Load waterbodies to the U.S. Environmental Protection Agency, Region 4, in 1998. The list was prepared by the Florida Department of Environmental Protection with input from the water management districts. The U.S. Environmental Protection Agency issued its final list of north central Florida Total Maximum Daily Load waterbodies in 2003.

Table 4.7, below, presents the U.S. Environmental Protection Agency-approved list of north central waterbodies which do not meet applicable water quality standards. The table also identifies the water quality parameters to be addressed through the development of Total Maximum Daily Loads.

As of June 2007, Total Maximum Daily Loads have been finalized for only one north central Florida watershed; the Fenholloway River (including Bevins/Boggy Creek). The Total Maximum Daily Load report includes a map of the waterbody and its watershed. It also identifies the sources of the pollutants. In the case of the Fenholloway River, the Total Maximum Daily Load report notes that discharge from the Buckeye Cellulose pulp mill may move its discharge point from its current location to 1.7 miles upstream from the Fenholloway River estuary. Such an approach is anticipated to meet the established Total Maximum Daily Loads for dissolved oxygen and un-ionized ammonia for the river. The Total Maximum Daily Load report notes, however, that moving the discharge point may increase chlorophyll concentrations to levels in the estuary that would cause a water quality standard violation. To address this issue, Buckeye Cellulose has undertaken additional monitoring and modeling activities. Buckeye Cellulose will also conduct additional nutrient modeling analysis to assess the possible effluent nutrient reductions that might be required to prevent harmful chlorophyll concentrations.

The Total Maximum Daily Load for the Bevins/Boggy Creek portion of the watershed suggests that rural farms with animals with access to streams as a possible source of fecal coliform.

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**TABLE 4.7**

**VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS  
(AS APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY)**

Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Projected Year of Total Managed Daily Load Development	Comments
<b>Fenholloway</b>						
<b>3473A</b>	Fenholloway at Mouth	Stream	Total Coliforms, Dissolved Oxygen, Biochemical Oxygen Demand	High	2002	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007
<b>3473B</b>	Fenholloway Below Pulp Mill	Stream	Dissolved Oxygen, Biochemical Oxygen Demand, Un-ionized Ammonia, Conductivity	High	2002	Total Managed Daily Loads Finalized by U.S. Environmental protection Agency, May 2007
<b>3603</b>	Bevins/Boggy Creek	Stream	Fecal Coliform	-	2002	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007. Although not listed in Water Quality Assessment Report: Suwannee, Fecal Coliform Total Managed Daily Loads were nevertheless established by U.S. Environmental Protection Agency for this waterbody.
<b>Lower Suwannee</b>						
<b>3422A</b>	Suwannee River, Lower	Stream	Mercury - Fish	Low	2011	Mercury concentrations for 1995, 1996, 1998, 1999, 2000, 2001, 2002 exceeded 0.5 milligram/kilogram.

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**TABLE 4.7 (Continued)**

**VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS  
(AS APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY)**

Water-body Identification number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Projected Year of Total Managed Daily Load Development	Comments
<b>3422D</b>	Suwannee Estuary	Estuary	Coliforms - Shellfish	Medium	2007	Listed due to downgrade in shellfish classification.
<b>3422B</b>	Suwannee River, Lower	Stream	Mercury - Fish	Low	2011	Mercury concentrations for 1995-2002 exceeded 0.5 milligram/kilogram.
<b>Other Coastal</b>						
<b>8032A</b>	Dekle Beach	Estuary	Coliforms - Beach Advisory	Medium	2007	Has advisories for more than 21 days in 2001.
<b>8032B</b>	Keaton Beach	Estuary	Coliforms - Beach Advisory	Medium	2007	Has advisories for more than 21 days in 2001.
<b>8032C</b>	Cedar Beach	Estuary	Coliforms - Beach Advisory	Medium	2007	Has advisories for more than 21 days in 2001.
<b>8035</b>	Suwannee Gulf 7	Estuary	Coliforms - Beach Advisory	Medium	2007	Has advisories for more than 21 days in 2001.
<b>Santa Fe</b>						
<b>3516</b>	Alligator Lake Outlet	Lake	Nutrients	Medium	2007	Linked to nutrients, and Biochemical Oxygen Demand. Nitrogen limited.
<b>3516</b>	Alligator Lake Outlet	Lake	Dissolved Oxygen	Medium	2007	Linked to nutrients. Nitrogen limited.

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**TABLE 4.7 (Continued)**

**VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS  
(AS APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY)**

Waterbody Identification number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Projected Year of Total Managed Daily Load Development	Comments
<b>3516A</b>	Alligator Lake	Lake	Nutrients	Medium	2007	Linked to nutrients and Biochemical Oxygen Demand. Nitrogen limited.
<b>3516A</b>	Alligator Lake	Lake	Dissolved Oxygen	Medium	2007	Linked to nutrients. Nitrogen limited.
<b>3605A</b>	Santa Fe River	Stream	Nutrients (Algal Mats and Historical Chlorophyll)	Medium	2007	Total Nitrogen is limiting nutrient.
<b>3605C</b>	Santa Fe River	Stream	Dissolved Oxygen	Medium	2007	Linked to nutrients.
<b>3520</b>	Cannon Creek	Stream	Fecal Coliforms	Medium	2007	
<b>3626</b>	Pareners Branch	Stream	Fecal Coliforms	Medium	2007	
<b>Upper Suwannee</b>						
<b>3341</b>	Suwannee River (Upper)	Stream	Dissolved Oxygen	High	2002	Linked to nutrients.
<b>3375</b>	Swift Creek	Stream	Dissolved Oxygen	High	2002	Linked to nutrients.
<b>3477</b>	Falling Creek	Stream	Dissolved Oxygen	High	2002	Linked to nutrients.

Sources: Water Quality Assessment Report: Suwannee, Florida Department of Environmental Protection, September 2003, and Total Managed Daily Loads in Florida, <http://www.epa.gov/region4/water/tmdl/florida/#econ>.

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### c. Fresh Water Wetlands

Wetlands play a vital role in controlling flood waters, tempering the impacts of hurricanes, and providing habitat to native Florida animal species. Vast amounts of Florida, including north central Florida, were originally wetlands. Over time, wetlands have been filled and drained for development, mosquito control, agricultural production, timber harvesting, and mining. Despite a lengthy history of drain and fill practices, the region still contains substantial wetland acreage.

Wetlands identified by the regional plan as Natural Resources of Regional Significance consist of Bee Haven Bay, California Swamp, Dixie County Coastal Fresh Water Wetlands, Fowlers Prairie, Gum Root Swamp, Hixtown Swamp, Lake Alto Swamp, Mallory Swamp, Osceola National Forest/Pinhook Swamp, Paynes Prairie, San Pedro Bay, Santa Fe Swamp, Spring Warrior Swamp, Taylor County Coastal Fresh Water Wetlands, Tide Swamp, and Wacassassa Flats.

#### i. Coastal Fresh Water Wetlands

The coastal fresh water wetlands are located adjacent to and landward of the Big Bend Salt Marsh and west of U.S. Highways 19 and 98. Coastal fresh water wetlands moderate the flow of surface water runoff to the Gulf by releasing water during dry periods and storing water during wet periods. The flow of fresh water to the gulf is vital to maintaining the brackish salt marsh environment. As coastal communities grow, it becomes increasingly important to minimize the alteration of coastal fresh water wetlands in order to maintain a healthy salt marsh and to minimize coastal flooding. Growth within coastal communities should not significantly alter the coastal wetland sediment deposition process.

Regionally significant coastal fresh water wetlands comprise 207,373 acres. The Dixie County Coastal Fresh Water Wetlands comprise 155,642 acres while the Taylor County Coastal Fresh Water Wetlands comprise 51,731 acres. Located within the fresh water coastal wetlands are three areas that, in their own right, qualify as Natural Resources of Regional Significance: California Swamp, Spring Warrior Swamp, and Tide Swamp. These areas are described below.

##### California Swamp

California Swamp is located in southwest Dixie County between Cross City and the Gulf of Mexico. It is adjacent to the Lower Suwannee National Wildlife Refuge and the Big Bend Salt Marsh. California Swamp is a coastal fresh water wetland. The variety of its habitat, wildlife, and its undeveloped nature make California Swamp a Natural Resource of Regional Significance in its own right. The major feature of California Swamp is an extensive cypress-hardwood swamp. However, a wide range of habitat types ranging from tidal marsh near the coast to upland hammocks and pine forest are found within California Swamp.

California Swamp occupies approximately 21,786 acres. It extends from Station Lake to the Big Bend Salt Marsh along Sanders Creek. Its width varies from five miles near California Lake to two miles farther south along Sanders Creek where the forest grades into salt marsh. California Swamp is generally flat, having a relief of approximately two to five feet and a gentle slope to the south. Drainage is poorly developed. In the area from Station Lake southward some flow is channelized through Fishbone and California Creeks into California Lake. From there water moves through Sanders Creek for the remaining five miles to the Gulf.



Although numerous logging roads were established, portions of the lower regions of the swamp are still inaccessible. Dirt roads are passable to California Lake and to a few private hunting camps located in the swamp.

Approximately 94.0 percent of the swamp watershed is forested land. The principal tree species include slash and loblolly pines, black gum, ash, oak, red maple, and cypress. Much of the land adjacent to the swamp has been extensively harvested and is planted pine forests. The swamp has a good population of deer, turkey, and squirrel. Other wildlife species include alligator, bear, raccoon, opossum, mink, and otter. The wetlands near the coast have many varieties of shore birds such as terns, plovers, and sandpipers. Wading birds living within the swamp include large populations of common and cattle egret, white ibis, and limpkin.

In 1973, California Swamp area was added to the Steinhatchee Wildlife Management Area. The now defunct Florida Bureau of Coastal Zone Planning generally outlined the entire Gulf Coastal marsh at the mouth of Sanders Creek and the hardwood swamp inland along the creek as an area deserving preservation status. The remaining areas of the California Lake watershed were also designated as deserving conservation status in the Bureau's management and development plans.

#### Spring Warrior Swamp

Spring Warrior Swamp is located in Taylor County approximately five miles south of the City of Perry and west of U.S. Highway 19. It comprises approximately 16,039 acres and includes floodplain forest with good stands of cypress and diverse hardwoods. The swamp is an important source of fresh water to the gulf coastal marsh. Drainage is provided from the swamp to the gulf via Spring Warrior Creek. The upland areas of the swamp include live oak, magnolia, cabbage palm, elm, maple, hickory, sweet gum, and others. This habitat is heavily used by spring and fall migratory passerine birds. Both upland and floodplain hardwoods in this area constitute a prime wildlife habitat and a source of raw materials for the timber industry.

#### Tide Swamp

Tide Swamp is located in southwest Taylor County on the Gulf side of State Road 361 just north of the Steinhatchee River. Tide Swamp comprises 15,236 acres. The swamp was purchased in 1986 by the State of Florida as part of the Big Bend Coastal Tracts acquisition. Tide Swamp is heavily vegetated and includes a variety of softwood and hardwood timber species along with an abundance of mixed grasses and reeds. Its diverse vegetation makes the area appealing to many wildlife species common to north central Florida including game and non-game migratory birds.

Portions of the swamp were previously cleared for forestry products in the 1930s. Proctor and Gamble, the former owners, managed the area for sustained yield timber production, hunting, and recreation in cooperation with the Florida Fish and Wildlife Conservation Commission. The state's management of Tide Swamp now focuses less on timber production and more on wildlife management through controlled burning, food plot maintenance, and some timber harvesting.

Wildlife found in Tide Swamp include whitetail deer, wild turkey, feral hogs, and squirrels. Additionally, numerous wading birds can be seen throughout the year all along the coastline. Migratory ducks and geese can be seen from September through April. Bald eagles and ospreys also frequent Tide Swamp.



Facilities at Tide Swamp are consistent with outdoor recreational uses. The state operates a public beach site at Hagin's Cove and maintains picnic tables and a boat ramp at Dallus Creek. In recognition of the growing popularity of bird watching, the state has constructed an observation tower near Hagin's Cove.

## ii. Inland Wetlands

Inland wetlands consist of wetlands located north and east of U.S. highways 19 and 98. They comprise large areas of north central Florida and perform many valuable functions. Inland wetlands provide habitat for native species and moderate the flow of surface and spring waters to prevent flooding. They are thought to provide the base flow for the region's rivers and springs. Almost every inland fresh water wetland identified as a Natural Resource of Regional Significance consists of a combination of wetlands and uplands. Within the wetland areas proper, virtually every wetland is either seasonal or semi-permanent in nature. Their degree of wetness is dependent upon the amount and timing of annual rainfall. The regional plan recognizes nine inland wetlands as Natural Resources of Regional Significance, eight of which are described below.

### Bee Haven Bay

Bee Haven Bay is located north of County Road 6 and Occidental Chemical's phosphate mining area and approximately four miles east of the City of Jasper in Hamilton County. As the name implies, Bee Haven Bay is a bayhead swamp consisting of bay trees, dahoon lolly, cypress, red maple, and other mixed hardwoods. The bay is prime habitat for black bear and other mammals. Drainage of the bay is by Rock Creek to the Suwannee River. The bay contains several species of bay pitcher plants listed as threatened species by the Florida Department of Agriculture and Consumer Services. Bee Haven Bay comprises 7,125 acres. Occidental has donated the mineral rights to Beehaven Bay to the Suwannee River Water Management District.

### Gum Root Swamp

Gum Root Swamp is a natural hardwood swamp covering 1,448 acres on the north side of Newnans Lake in eastern Alachua County. The swamp owes its environmental value to its function as a natural filter and purifier for runoff waters for a large watershed.

At its position at the base of the Hatchett Creek watershed, all the waters from the creek as well as overland flow from a wide area pass through the swamp before entering Newnans Lake. These waters are very high in nutrients due to the large amount of surrounding agricultural land and the number of homes in the vicinity. Biological processes occurring in the swamp convert nutrients in the water to cellulose and plant life, leaving the water in a more purified form as it flows into Newnan's Lake. Currently, the large nutrient production in the watershed exceeds the capacity of Gum Root Swamp to assimilate these nutrients and has contributed to the eutrophication of the lake.

A wide, often wet, and heavily vegetated fringe area has helped restrict access and development of the swamp. In this fringe area the dominant forest vegetation includes live oak, laurel oak, and red maple. The predominant understory species include gallberry, palmetto, wax myrtle, red bay, blackberry, and American holly.

Cypress and gum trees predominate the swamp while red maple and bay trees are also abundant. The numbers of sweet gum, wax myrtle, and gallberry increase in density toward the edge of the swamp. Many

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



ferns, mosses, and lichen are evident as undergrowth vegetation. Selective cutting of hardwood occurred approximately 50 years ago. Abandoned, overgrown tramways as well as debris left over from earlier cuttings have been found among the thick vegetation. The swamp appears to have regained its natural state and no evidence of recent harvesting is apparent. Mixed hardwoods of commercial value exist in the swamp.

Gum Root Swamp is considered to have one of the largest varieties of wildlife species of any area in Alachua County. There are at least two rare or endangered species living in this swamp including a small colony of wood storks and a small number of bald eagles. Other birds which frequent the area include egrets, herons, bitterns, and white ibis. Also identified in the area are anhinga, osprey, loon, cormorant, black and turkey vulture, and turkey. Deer and otter also inhabit the swamp and its marginal areas.

#### Hixtown Swamp

Hixtown Swamp is located between the cities of Madison and Greenville in central Madison County. It is roughly confined on the north by U.S. Highway 90 and on the south by Interstate 10. Hixtown Swamp comprises approximately 10,289 acres.

The swamp is a wide expanse of wetlands interspersed with islands, peninsulas, and cypress stands. It is surrounded by higher rolling country. The highlands surrounding the swamp often reach elevations approximately 50 feet higher than the swamp. It is the most extensive, undisturbed cypress swamp still found in northern Florida. Many of the islands of pond and bald cypress which were cut around 1900 have returned to sizeable trees of 12 to 18 inches in diameter. The luxuriant undergrowth includes many species commonly found in more northern areas and is almost totally different from the semitropical cypress swamps of south Florida.

A rich diversity of wildlife occurs in the swamp. The area contains one of north Florida's heaviest concentrations of wildlife. In addition to alligator, other large species include otter, raccoon, wildcat, deer, fox, and black bear. Wading birds are abundant, including white ibis, American egret, sandhill crane, great blue heron, Louisiana heron, little green heron, little blue heron, least bittern, common bittern, limpkin, many duck species, black and turkey vulture, osprey, bald eagle and the wood stork.<sup>33</sup>

The highlands surrounding the swamp are largely devoted to farming and cattle grazing. A small amount of pulp cutting and some cypress timbering occurs in the fringe areas. However, there appears to be no large-scale tree harvesting at present. Domestic cattle use pastures abutting the swamp when dry. The adjacent waters of the swamp often provide a source of drinking water to these animals.

Cypress and bottomland hardwoods predominate the isolated hammock islands and in low areas bordering the swamp. Plant species occurring in the fringe area include spruce, slash, loblolly and longleaf pines, bottomland gums, and many varieties of oak, magnolia, and willow. The dense understory consists of way myrtle, sea myrtle, elderberry, green briar, sumac, and wild plum.

The swamp is one of the most productive wetlands in north central Florida. The dominant aquatic vegetation in the swamp is maidencane. Associated species are abundant and consist of frogbit, floating hear, wampee, pickerel weed, cow tongue, golden club, dotted smartweed, watershield, water lily, and a variety of aquatic grasses.

<sup>33</sup>Significant Natural Areas, pg. 54.



Drainage in the marsh is generally in a southeasterly direction with one small stream, Sundown Creek, carrying a majority of the outflow for the area. Several other culverts running beneath I-10 transmit water to southern portions of the swamp.

#### Lochloosa Conservation Area

The Lochloosa Wildlife Conservation Area is located in southeastern Alachua County and comprises 10,352 acres, including 1,200 acres of Orange Lake. Approximately 62.0 percent of the land area is composed of commercial pine plantation. The remainder is in natural condition and the biological communities are in good health. Lochloosa Forest forms the habitat for several listed species.<sup>34</sup> Approximately 16 active bald eagle nests are in the area.<sup>35</sup> The River Styx rookery, located within the forest, contains one of the two most important wood stork colonies in northern Florida. Between 100 and 125 nesting pairs of wood stork, recognized as an endangered species, nest in the large cypress trees of the rookery.<sup>36</sup> It is one of the few stable and constantly productive rookeries in the state. The few colonies of wood storks in Florida and one colony in Georgia, are all that exist in North America. In addition, the rookery is used as a nesting site by many ospreys and herons.<sup>37</sup>

The River Styx flows through the conservation area into the northern tip of Orange Lake. The river environment is defined by a broad expanse of swamp forest and hammock for two and one-half miles from Camps Canal on the north to Orange Lake on the south. The river's sluggish trace southward is obscured within a 3,500 acre area of swamp, forest, and hardwood hammock. The dense, undisturbed vegetation system gives way to a shallow marsh area at its junction with Orange Lake. The inaccessibility of the area creates a large rookery for colonies of wading birds otherwise sensitive to human encroachment.

#### Mallory Swamp and San Pedro Bay

Totaling 515,774 acres, Mallory Swamp and San Pedro Bay comprise the largest inland wetland system in the region. They form a nearly continuous band of wetlands through Dixie, Lafayette, and Taylor counties north of U.S. Highway 19. These large wetlands form the headwaters of the streams that comprise the coastal rivers basin, including the Econfina, Fenholloway, and Steinhatchee rivers. Most of the area consists of large tracts owned by timber companies. Between the 1930s and the 1970s, canals were dug to drain the wetlands for pine production but, due to the wetness of the area, were only partially successful. As a result, the area is currently a mixture of pine plantation and wetlands.

Mallory Swamp and San Pedro Bay are of regional significance due to their role in maintaining the hydrologic balance of the coastal rivers and their estuaries. In a natural state, these wetlands serve as a wide, shallow

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<sup>34</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.

<sup>35</sup>Annual Report of the Conservation and Recreation Lands Section Committee, Division of State Lands, Tallahassee, Fl., 1985, pg. 211.

<sup>36</sup>Robert M. Brantley, Executive Director of the Florida Game and Fresh Water Fish Commission, correspondence of March 6, 1984 to Mr. John Bethea, Director, Division of Forestry, Department of Agriculture and Consumer Services, Tallahassee, Fl.

<sup>37</sup>Significant Natural Areas, pg. 82.



reservoir of both ground and surface waters. They provide the base flow for the coastal rivers through surface runoff and seepage from surficial aquifers. The past drainage efforts have altered the hydrologic balance by releasing too much storm water too quickly, resulting in disruptions to sensitive estuarine ecosystems. Because estuaries are uniquely adapted to, and dependent on, cyclical changes of fresh water inflow, changes to that balance can have significant adverse impacts to the estuary.

The Suwannee River Water Management District in the late 1980s examined the issue at the request of the Steinhatchee River Association, whose members were concerned about declining fisheries in the Steinhatchee River estuary. The District's study determined there was too much water draining too quickly into the river and estuary after storm events, but the hydrologic alterations upstream alone could not be the sole cause for the declining fishery.

The Steinhatchee River study confirmed that the past drainage attempts created significant hydrologic changes in the watershed. The study identified six major canal systems totaling 76 miles. Dug by timber companies, the canals were designed to speed drainage for improved pine tree growth and improved access for logging trucks. The canals caused surface water runoff within the basin to move much faster to the Gulf after heavy rains. Research studies in other Florida waters have shown the runoff interferes with fish using estuaries.

The area timber companies voluntarily agreed to change practices to allow the land to retain more water after rains. Those changes include installing flashboard culverts, allowing canals to become overgrown with vegetation and reducing road elevations to allow water to overflow from roadside canals into adjacent wetlands. The results to date have been noticeable downstream with less freshwater flooding after rains. The District has purchased 31,321 acres of Mallory Swamp in southern Lafayette County to help alleviate the concern.

#### Osceola National Forest/Pinhook Swamp

Lying 15 miles northeast of Lake City and extending through much of Columbia County to the Georgia border, the Osceola National Forest/ Pinhook Swamp area is essentially one continuous wetland system from the Okefenokee Swamp to Interstate Highway 10. The swamp extends eastward from U.S. Highway 441 into Baker County and the Northeast Florida Regional Planning District. Covering 184,350 acres within north central Florida, the swamp is the largest continuous wilderness area in the region.

The northern portion of the area is dominated by Pinhook Swamp, which is predominantly a cypress, gum, and loblolly bay swamp. It is a vast open area which is almost continually flooded, interspersed with dotted pine, cypress, and shrubs in open areas. The swamp is not as aesthetically pleasing as other Natural Resources of Regional Significance within the region but has a unique character due to the bleak wilderness quality of the expansive tree dotted prairie and thick fetter bush and titi-based vegetation around its fringe.

The swamp is very wet with many peat bogs and generally has a very rich humus soil. Pine forests are found in higher areas around the swamp and the southern half of Osceola National Forest. Slash pines are, in many cases, planted in fringe areas, but harvesting has apparently not been on a large scale due to the wetness of the ground. These fringe areas are typical pine flatwoods which give way near the swamp to cypress, slash and long-leaf pine, magnolia, and sweet bay.

The area is a valuable wildlife habitat. Rare, endangered, or protected species included in this habitat are the Black Bear, the Florida sandhill crane, and the bald eagle. It has one-third of Florida's entire bear population. The swamp has a good population of deer and turkey, squirrel, rabbit, otter, beaver, and many

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varieties of snakes and other reptiles, including alligators. Common birds reported in this area include the anhinga, many species of egrets, heron, and ibis, as well as many duck species, including wood duck. Canadian geese now frequent the area as winter residents.

Drainage of the swamp is very poor. Timber companies have dug a few canals to drain portions of the swamp by channeling runoff water into fringe areas and off of access roads. However, no large scale drainage works have been undertaken. Surface runoff generally flows westerly to the Suwannee River principally through Little Creek with some runoff flowing easterly to St. Mary's River in Baker County.

#### Santa Fe Swamp

Santa Fe Swamp is located north of Little Santa Fe Lake in northeastern Alachua County and southeastern Bradford County. The swamp in its natural capacity performs valuable services to the region as part of the headwaters of Santa Fe River, contributing to aquifer recharge and serving as an excellent and remote wildlife habitat. Santa Fe Swamp was donated by the Georgia-Pacific Corporation to the Suwannee River Water Management District in 1984.

Santa Fe Swamp encompasses 7,403 acres. The major feature of this area is its extensive hardwood swamp. A 300-acre sandhill community dominated by longleaf pine, turkey oak, and wire grass is found along the eastern side of the swamp. The remainder of the property consists primarily of inaccessible wetlands. The swamp community consists of a mosaic of vegetation types including pine flatwoods, cypress swamps, bayheads, wet prairies, and marshes, portions of which resemble Okefenokee Swamp. The dominant swamp vegetation includes cypress, gum, and bay trees.

Water quality is largely unknown but is probably good based upon limited available records and visual inspection of the Santa Fe River near the swamp. A considerable number of wading birds have been observed in the feeding ponds and prairies, and the area provides habitat for waterfowl and game species. In addition, nesting pairs of bald eagles have been observed in the swamp along with black bear and wood stork.

Animal species inhabiting the area around the Santa Fe River likely reside in the swamp. There are no roads or access to it of any kind. Appearing completely undisturbed and of high aesthetic value, the area is expected to be the habitat of a diverse and abundant wildlife population.

#### Wacassassa Flats

Occupying approximately 61,653 acres, Wacassassa Flats runs down the center of Gilchrist County. The flats are part of a larger wetland system which runs into Levy County and the Withlacoochee Regional Planning District. During the rainy season, waters in the aquifer build up sufficient pressure to spill out of the many sinkholes and ponds scattered throughout the flats to inundate the area.

The area is predominantly comprised of commercial pine plantation. Pine stands are interspersed among numerous cypress ponds, depression marshes, hydric hammock, and other wetland communities. Several lakes (the largest of which is 150 acres), small areas of upland hardwood forest, sandhill, and other minor natural communities contribute to the diversity of the flats.



## d. Lakes

Lakes identified as Natural Resources of Regional Significance include those of relatively large size, those with shorelines under the control of two or more local governments, and those which are environmentally sensitive. Several of the lakes are recognized by the state as Outstanding Florida Waters while others are included in the Suwannee River Water Management District's Surface Water Improvement Management (SWIM) program. Regionally significant lakes are Orange Lake, Santa Fe Lake, Little Santa Fe Lake, Newnans Lake, Lake Lochloosa, Watermelon Pond, Lake Sampson, Lake Butler, Lake Geneva, and Alligator Lake.<sup>38</sup> Two lakes are highlighted below.

### i. Alligator Lake

Alligator Lake is 968 acres of lake, wetlands, and flood plain located in central Columbia County. The lake proper consists of two interconnected waterbodies. The northern lake, locally known as "Big Lake" is located within the City of Lake City. The smaller waterbody, known as "Small Lake" is located in unincorporated Columbia County. Alligator Lake owes its regional significance to several plugged sinkholes which are located within the lake. The sinkholes have direct connection to the Floridan Aquifer. Approximately once every five to seven years, one or more of the sinkholes become unplugged, draining the contents of the lake into the Floridan Aquifer. Approximately one-half of the lake was diked and drained by private property owners during the 1950s and 1960s. A Florida State Supreme Court decision (Hill vs. McDuffie) ruled, among other things that the diked area was land, not lake, and that the dike could remain.

The lake is located in an area of low elevation and receives considerable surface water runoff from the city of Lake City. Most of Lake City was developed before enactment of surface water management regulations. As a result, surface waters entering the lake receive little treatment. Alligator Lake was recognized as one of the 50 poorest lakes in the state in terms of water quality by the Florida Department of Environmental Regulation in 1983. The ranking was primarily due to high nutrient levels, chronic algal blooms, and fish kills.<sup>39</sup> In 1988, the Suwannee River Water Management District classified Alligator Lake as a "priority water" in their Surface Water Improvement Management program. It is the only waterbody listed as a "restoration" waterbody on the District's Surface Water Improvement Management program priority list. In 1995, Columbia County applied for and received funding from Florida Communities Trust to purchase the diked portion of Alligator Lake and to restore the lake to its original condition.

### ii. Newnans Lake

Located just east of the city of Gainesville in Alachua County, Newnans Lake is a perched surface waterbody with an area of 6,007 acres and a mean depth of six feet.<sup>40</sup> The lake obtains regional significance for several reasons. The northern lake shoreline is the boundary of Gum Root Swamp, a Natural Resource of Regional Significance. Prairie Creek, the lake's only surface outflow, flows directly to Paynes Prairie State

<sup>38</sup>Surface area information was generally obtained from Edward A. Fernald and Donald J. Patton, Water Resources in Florida, Florida State University, Tallahassee, FL., 1984, pg. 285. The surface area of Alligator Lake, is estimated by the North Central Florida Regional Planning Council, September, 1994.

<sup>39</sup>Myers, V.B. and Edmiston, Florida Lake Classification and Prioritization, Final Report. Project #S004388. Florida Department of Environmental Regulation Technical Report, Tallahassee, FL., 1983.

<sup>40</sup>Ad Hoc Committee for Newnan's Lake Environmental Concerns, Report: 1983 Alachua County, Gainesville, FL., 1983, pg. 13.

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Preserve. A natural edge of cypress and gum trees in a relatively undisturbed state surrounds the entire lake. Due to a wet shoreline, very little residential development exists next to the lake.

## e. River Corridors

Regionally significant river corridors consist of the Alapaha, Aucilla, Econfina, Ichetucknee, Santa Fe, Steinhatchee, Suwannee and Withlacoochee rivers. In addition, three small streams located in southeastern Alachua County, the River Styx, Prairie Creek, and Cross Creek, are also recognized by the regional plan as Natural Resources of Regional Significance. River corridors consist of the stream channel and the 100-year floodplain. In the case of the Econfina, and Steinhatchee rivers, as well as the River Styx, Prairie Creek, and Cross Creek, the river corridor consists of the river/stream channel and a buffer area extending landward 1/4-mile from the commonly-recognized river/stream banks. The buffers will be replaced by the 100-year floodplain of these rivers as floodplain information becomes available. The 1/4-mile river buffers and the 100-year floodplain of the Suwannee River system comprise 165,123 acres.

### i. Alapaha River Corridor

The Alapaha River travels 125 miles from its headwaters in southwestern Georgia to the Suwannee River in Hamilton County. The Alapaha drainage basin contains 1,840 square miles. Only a small portion of the river, approximately 40 miles, flows through north central Florida. Similarly, only 140 square miles of its 1,840 square mile drainage basin is located in the region. The river flow averages 1,346 cubic feet per second.<sup>41</sup>

The Alapaha is similar to the upper Suwannee with high and steep banks winding through undeveloped forest lands. Unlike the Suwannee, the Alapaha is divided into two distinct segments by a group of sinks. The river flows continuously year-round in the northern segment. The northern segment flows into the sinks, channeling a significant portion of the river flow underground. The southern segment flows intermittently. The sinks absorb all of the northern segment waters during periods of low flow. Water flows the entire length of the Alapaha about 60 percent of the time. The river's waters travel through underground limestone channels for 19 miles to re-emerge at Alapaha Rise and possibly Holton Spring.

### ii. Aucilla River Corridor

The Aucilla River begins near the Georgia community of Boston and meanders 69 miles through Florida to the Gulf of Mexico. The river drains approximately 805 square miles and has an average discharge of 436 cubic feet per second.<sup>42</sup>

Forming the boundary between Jefferson, Madison, and Taylor counties, the Aucilla River flows through the Aucilla Wildlife Management Area in northern Taylor County to the St. Marks Wildlife Management Area on the gulf. The Aucilla River provides some of Florida's most unspoiled river vistas available to canoeists and hikers. The river has been designated an Outstanding Florida Water. The state recently purchased property adjacent to the river to protect a unique sink area known as the Aucilla River Sinks, a Natural Resource of Regional Significance in its own right. The river traverses upland forests of longleaf pine and

<sup>41</sup>Water Resources Division, United States Geological Survey, Water Resource Data for Florida, Vol. 4, Northwest Florida, Tallahassee, Fl., 1984.

<sup>42</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.



turkey oak, old growth mesic and hydric hardwood forests, cypress and gum swamps, beech-magnolia groves, live oak hammocks, and finally the salt marsh of the St. Marks National Wildlife Refuge.

Bald eagles, osprey, otters, and turkeys are seen, as are smaller animals such as fox squirrels and raccoons. Many species of birds either nest or migrate through the coastal marsh segment of the river. Indian mounds dating back more than 2,000 years are scattered along it. Much of the river floodplain is owned and managed by timber companies effectively restricting residential development. The two wildlife management areas provide habitat for many plant and wildlife species.

### iii. Econfina River Corridor

Located approximately midway between the Aucilla River and the City of Perry, the Econfina River has a length of approximately 32 miles and a drainage area of 198 square miles. The river has an average discharge of 138 cubic feet per second.<sup>43</sup> Its principal attraction is the relatively natural condition of its banks and estuary. Virtually no residential development has taken place along its entire length. Hardwood forest lines the banks of the river while numerous adjacent lands are in managed pine forest. The river is much wider at the Gulf and forms an important estuary.

Water quality of the river and adjoining salt marsh is very good. The adjoining forests contribute to the quality of the salt marsh by filtering water before it reaches the coast and by acting as a buffer between the salt marsh and the forest industry land to the north. The river corridor is primarily a mixture of hydric and mesic communities. The major ecosystems found on the river include salt marsh, mixed-pine-hardwood community, pine-oak-palm community, and river swamp.

### iv. Ichetucknee River Corridor

Ichetucknee Springs forms the headwaters of this five-mile long river which forms the border between southern Columbia and Suwannee counties. Its clear waters make the river a very popular location for canoeing, rafting, and tubing. The Ichetucknee River is designated by the State of Florida as an Outstanding Florida Water.

The river runs past high limestone banks, river swamp, and marsh shoreline where dominant plant types are ribbon grass, spatterdock, coastal willow, and buttonbush. The swamp area has several beaver lodges. Animals common to the park include turkey, limpkin, apple snail, Suwannee bass, gulf pipe fish, and river otter. Recently, manatees have been sighted in the river.

The river floodplain is mainly composed of sandhills and mesic hammock vegetation. A sandhill community is located in the highest elevations. Common plants include turkey oaks, sand post oak, longleaf pine, bracken fern, and wiregrass. The corridor contains a small area of river swamp which is poorly drained, frequently flooded, and has a dense canopy. Dominant trees include red maple, sweetgum, American elm, Florida ash, and bald cypress.

### v. Santa Fe River Corridor

The Santa Fe River is the largest tributary of the Suwannee, flowing 75 miles from its headwaters at Santa Fe Lake in northeast Alachua County to its confluence with the Suwannee River in northwest Gilchrist

<sup>43</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.



County. The river drains a watershed of 1,440 square miles. The Santa Fe has four major tributaries of its own: the Ichetucknee River, New River, Sampson River, and Olustee Creek. Both the Santa Fe River and Olustee Creek are designated as Outstanding Florida Waters. With average recorded flows of more than 1,500 cubic feet per second, the large volume of surface waters flowing through the river make the Santa Fe a Natural Resource of Regional Significance independent of the Suwannee.<sup>44</sup>

The forest areas which surround the river consist of swamp forest and hammock forest. The swamp forest has an abundant diversity of tree species including sweet gum, tupelo gum, pumpkin ash, Carolina ash, laurel oak, Florida elm, red maple, bald cypress, water hickory and water locust. The intermittently flooded areas of the river swamp show a preponderance for live oak trees. The overcup oak and river birch species reach the southern limit of their range along the Santa Fe River.

Most wildlife species found in north central Florida can also be found along the Santa Fe River. Bobcats and an occasional black bear may still be found. Wide-ranging species such as deer, grey squirrel, turkey, and otter are also present. Alligators are abundant, particularly in the eastern portion of the river. The bird population is extensive and includes the common egret and heron, pileated woodpecker, limpkin, kingfisher, red shouldered hawk, barn owl, several species of warbler, and the rare Mississippi kite.<sup>45</sup>

The Santa Fe River is in a nearly natural state and receives almost no domestic or industrial pollution. The most notable attribute of the upper Santa Fe River is the Santa Fe Swamp, which is owned by the Suwannee River Water Management District. The lower Santa Fe is noted for its many springs. The area between O'leno State Park and the Suwannee River confluence is the center of the range of the Suwannee Bass, a species of very restricted distribution, which is also an excellent game fish. The lower Santa Fe harbors an estimated 80 to 90 percent of the total population of this unique species. The area between the Ichetucknee River and Poe Springs is an important fossil site. Many springs are found along the river, including Poe Spring, Lily Spring, Ginnie Springs, Devil's Eye Spring, Dogwood Spring, July Spring, Blue Spring, Naked Spring, and Rum Island Spring.

#### vi. Steinhatchee River Corridor

The Steinhatchee River Corridor forms the border between Dixie and Taylor counties. The Steinhatchee River is approximately 30 miles long and has an average flow of 325 cubic feet per second.<sup>46</sup> The river is formed out of many small tributaries whose headwaters are found in San Pedro Bay, which is in northern Taylor and southern Lafayette counties. Approximately four miles downstream of Steinhatchee Springs, the river disappears underground for a distance of approximately ½ mile. From its resurgence it is possible to canoe the entire distance to the Gulf without portage. Downstream, the river forms a large estuary at the Gulf coast. The town of Steinhatchee, a small fishing village, is located at the river's mouth.

The outstanding feature of the Steinhatchee is its undeveloped nature. Virtually the entire length of the river from Steinhatchee Springs to the town of Steinhatchee is in a relatively natural state. Many hardwood trees line its banks. Another distinctive feature of the river are the extensive tidal flats at its mouth. The river has a relatively large coastal drainage basin of approximately 375,000 acres, most of which is wet forests and titi-based swamps.

<sup>44</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.

<sup>45</sup>Significant Natural Areas, Gainesville, Fl., 1977, pg. 60.

<sup>46</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.



## vii. Suwannee River Corridor

The Suwannee River Corridor consists of the 100-year floodplain of the Suwannee River. The Suwannee River Corridor serves an important role in the region by linking inland wetlands to Gulf coastal marshes. The river also plays an important role in the control of fresh water flooding. No flood control structures are found along the river within the State of Florida. Instead, the Suwannee relies upon its large floodplain to control flood waters. The Suwannee River is the setting of many natural features including an abundance of fresh water springs, sinks, and underwater caves. The river is widely used as a recreational resource for camping, boating, canoeing, skindiving, and fishing.

The Suwannee River is the second largest Florida river in terms of water flow and is one of the most important water resources in the region. The river is 235 miles in length, of which 207 miles traverse north central Florida. From its headwaters in the Okefenokee Swamp in southern Georgia, the river flows south across the Northern Highlands and into the Gulf Coastal Lowlands, eventually draining 9,950 square miles into its estuary at the Gulf of Mexico. The Suwannee forms the borders of seven north central Florida counties and drains all, or portions of, ten counties within the region.<sup>47</sup> The Suwannee River estuary is a complex system of diverse natural communities and is a major nursery for commercial fish and shellfish.

The Suwannee has a flow of approximately one billion gallons per day at its entrance to the State of Florida and empties seven billion gallons per day into the Gulf of Mexico.<sup>48</sup> Unlike many rivers, the Suwannee's water quality is generally better downstream than up. The headwaters of the Suwannee, the Okefenokee Swamp in Georgia, produce a dark-colored water flow high in tannic and humic acids from the decay of lush swamp vegetation. Downstream springs provide the Suwannee with a high quality water source. The Suwannee is fed by more than 50 springs. During periods of drought the springs are a major source of the Suwannee's water.

The Suwannee has relatively few tributaries compared with most rivers due to the basin's well-draining sands and underlying limestone channels. Instead of having many tributaries as sources of water, the great number of sinks and lakes in the region collect rain and local runoff before it can reach the Suwannee. Thus the soils and sinkholes contribute to water pressure deep inside the aquifer, helping to promote the flow of high quality spring water to the Suwannee.

The Suwannee River flows across sediments formed over a time span of 40 million years. Many of these sediments, deposited in large deltas, estuaries, and shallow ocean environments, are composed of limestone, dolostone, and other sandy materials. The dissolution of underlying limestone produces scenic rock outcroppings, sinkholes, and the many springs along the river. This diversification of geologic features greatly contributes to its scenic and recreational value.

The vegetation along the river adds to its scenic beauty. Its forested banks are unique in that they traverse every major terrestrial habitat in Florida. Fresh water marsh and swamp forests occur at its headwaters while salt marsh can be found at the river's mouth. The variety, size, and geographic location of its plant communities are noteworthy.

The river and its heavily forested floodplains provide excellent habitat for many fish and animal species, most notably the Suwannee black bass, Okefenokee pigmy sunfish, West Indian manatee and Atlantic

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<sup>47</sup>Except Taylor County.

<sup>48</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.



sturgeon. The sturgeon have historically been a mainstay of fishermen all along the Gulf coast. However, due to over-fishing, dam construction, and river pollution, their numbers have declined to the point where it is considered an endangered specie on the Mississippi River. The Suwannee River is the only river in the eastern Gulf of Mexico which supports a normally functioning population of Atlantic sturgeon. In the spring, adult sturgeons migrate upstream from their wintering grounds over the continental shelf to spawning areas in shallow portions of the upper Suwannee. Adults return to the Gulf of Mexico in the fall. Juveniles may remain in fresh or brackish water for three to five years before entering the open ocean.<sup>49</sup> West Indian manatees occur in the lower Suwannee River during the warmer months of the year. During the winter months, they concentrate at Manatee Springs, one of six natural warm water refuges within the state for this endangered species.<sup>50</sup>

Thirty-nine species of amphibians, 73 species and subspecies of reptiles, 232 species and subspecies of birds, and 42 species and subspecies of mammals are present within the Suwannee River Corridor.<sup>51</sup> The large number of species may be attributable to the river's diverse and undeveloped habitat. The river forms an important dividing line that abruptly terminates the range of a number of species. Some animal species such as the alligator snapping turtle, wood thrush and marsh hawk reach the southern and eastern limits of their range on the northeast bank of the Suwannee. Other species reach their westerly and northerly limits at the river, such as the Florida crow and the Florida black bass.<sup>52</sup> Forested areas along the river support white-tailed deer and wild turkey. Black bear can be found in small numbers.

Small game species occurring in the watershed include bobwhite quail, mourning dove, grey squirrel, woodcock and common snipe. The Suwannee River estuary has abundant habitat for waterfowl. Many duck species use the river including mallard, pintail, red-breasted merganser, black duck, and gadwall.

The Suwannee has not been significantly degraded due to human use. The river's water quality is high and its banks are relatively free of streamside development. Recreational use of the Suwannee River and its tributaries (Alapaha, Ichetucknee, Santa Fe, and Withlacoochee rivers) is increasing as the region's population grows and people from around the state become increasingly aware of its recreational resources. Potential for conflicts and resource degradation (e.g., bank and shoreline erosion, water pollution, manatee collisions, etc.) increases in direct proportion to increased use of the river system.

The Florida Fish and Wildlife Conservation Commission has the primary responsibility for establishing boating safety zones. Local governments have limited responsibility for establishing boating safety zones, which in turn are enforced by the Florida Fish and Wildlife Conservation Commission, the Florida Marine Patrol, and local law enforcement agencies. There are no consistent, enforceable boating traffic controls currently in effect on the Suwannee or its tributaries. An opportunity exists for state agencies and local governments to coordinate in the development of a comprehensive boating safety and resource protection strategy for the Suwannee River system.

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<sup>49</sup>Angelo D. Becasso, Nick Fotheringham, Alice E. Redfield, Ronald L. Frew, William M. Levitan, Joel E. Smith, and Jarrett O. Woodrow, Jr., Gulf Coast Ecological Inventory: User's Guide and Information Base, Dames and Moore, Bethesda, Md., 1982, pg. 132.

<sup>50</sup> Gulf Coast Ecological Inventory: User's Guide and Information Base, pg. 130.

<sup>51</sup> Gulf Coast Ecological Inventory: User's Guide and Information Base, pg. 132.

<sup>52</sup>S. David Webb, "A Short Report on the Ecology of the Suwannee River Drainage", Florida State Museum, Gainesville, Fl., 1970, pg. 4-7.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



### viii. Withlacoochee River Corridor

The Withlacoochee River begins its 108-mile journey to the Suwannee near Tifton, Georgia. Flowing southeasterly, it joins the Suwannee near Ellaville at Suwannee River State Park. Some 28 miles of the river lies within Florida, forming the border between Madison and Hamilton counties. The river flows through some of the state's most picturesque wetlands, with its varying river channel exhibiting such features as sandy beaches and impressive limestone outcroppings. Several springs feed the Withlacoochee and add to its scenic qualities, including Withlacoochee Blue Spring, Suwanacoochee Spring, and Morgan Springs. Approximately 2,120 square miles are contained within the Withlacoochee drainage basin in Georgia and Florida. The river itself has a recorded discharge at the Suwannee ranging from 93 to 2,060 cubic feet per second with an average flow of approximately 1,000 cubic feet per second.<sup>53</sup>

The river is accessible by small boats and canoes. Shoals and shallow areas severely limit powerboat access. Only one public boat launch is on the Withlacoochee, with canoes and other small boats primarily launched at road crossings. The Withlacoochee River Canoe Trail was the first river canoe trail established in Florida. The Florida Department of Environmental Protection maintains the trail in cooperation with the Coastal Plain Area Tourism Council of Valdosta, Georgia. The trail begins north of Valdosta and ends 56 miles downstream at its confluence with the Suwannee River.

The ecology of the Withlacoochee River is similar to the Suwannee. Forest types vary considerably. Longleaf and slash pine forest located in the sandhills give way to bottomland forest near the river. Oak and pine form the predominant tree types. The forests along the river's bank are harvested primarily for pulpwood. There are very few areas with residential development along the river, and these are located near the river's mouth at its junction with the Suwannee. The remainder of the river corridor is in a relatively natural condition.

Wildlife species occurring within the river corridor include a year-round population of wood duck. Beaver, once trapped out of the river for their fur, are active and contributing to tree damage. Deer, gray and red fox, and a variety of bird species including the kingfisher and many species of swallow are abundant. A fish survey of the river by the Florida Fish and Wildlife Conservation Commission identified 31 species including Suwannee bass, warmouth, blue gill, shellcracker, red breast sunfish, spotted sucker, several species of shiner, and shad in the river.

Agricultural runoff and industrial pollution affect the river's water quality. The latter results from the discharge of approximately 11.7 million gallons per day of paperboard mill wastewater into the Withlacoochee River near Clyattville, Georgia. Nutrient overloads and low levels of dissolved oxygen in the river are caused, at least in part, by these effluents. Runoff from adjacent agricultural lands is the likely source of high levels of coliform bacteria and phosphate found in the river.

Despite the pollution concerns regarding small segments of the river, it remains essentially an undeveloped natural river affording excellent recreation potential. The varied character of the river itself, besides the profuse natural vegetation and absence of development, creates a very impressive aesthetic appearance offering a pleasing, and perhaps primitive, river experience.

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<sup>53</sup>Water Resource Data for Florida, Vol. 4, Northwest Florida.



ix. Cross Creek, Prairie Creek and River Styx Corridors

Cross Creek, Prairie Creek, and the River Styx are small perennial streams in southeastern Alachua County. Cross Creek is the smallest of the three at approximately one mile in length. It is designated an Outstanding Florida Water and connects two regionally significant lakes, Orange Lake and Lake Lochloosa, both of which are also designated as Outstanding Florida Waters. At six miles in length, the River Styx is the longest of the three streams. The River Styx is also designated as an Outstanding Florida Water and connects Paynes Prairie State Preserve to Orange Lake. Prairie Creek is approximately two miles in length and connects Newnans Lake, a Natural Resource of Regional Significance, to Paynes Prairie State Preserve.

f. Springs

More than 100 springs exist in the region, most of which are found along the Suwannee and Santa Fe rivers. Most of the springs issue under artesian pressure from the Floridan Aquifer with an average water temperature of 70 degrees Fahrenheit.<sup>54</sup> Regionally significant springs are identified in Table 4.1. Most regionally significant springs flow into the Suwannee River system. These springs provide significant volume to the flow of the river and affect the river's water quality. During periods of low water tables, the springs occasionally act as sinkholes; whereby, the Suwannee discharges its flow to the Floridan Aquifer. The springs are a primary source of recreation, providing locations for camping, canoeing, swimming, and snorkeling. In addition, north central Florida springs are internationally famous among cave divers.

Groundwater that maintains the region's springs is susceptible to contamination from activities occurring within spring capture zones. Spring capture zones are similar to water wellhead capture zones. They represent a geographic area near the spring where, if groundwater is contaminated, it will be disgorged by the spring at the earth's surface. Similar to wellhead capture zones, spring capture zones can be delineated by treating springs as pumping wells and using the U.S. Environmental Protection Agency's Wellhead Protection Area computer model to determine the size and shape of the capture zones. Spring capture zones have not been delineated for north central Florida springs. Delineation is important in order to protect the water quality of north central Florida springs and the surface waters supplied by springs. Three of the region's springs are highlighted below.

i. Ginnie Spring

Located on the Santa Fe River in northeast Gilchrist County and northwest Alachua County, Ginnie Spring is associated with nine other nearby springs: Poe, Lily, Devil's Pond, Dogwood, July, Blue, Rum Island, Naked, and Poe. They are in a natural woodland setting easily accessible from each other. Much of the plant life near the springs is in a near natural state. Large species of cypress, oak, and maple trees surrounded by a dense undergrowth of natural vegetation, occur along the adjacent Santa Fe River and the spring group. A privately-owned campground surrounds Ginnie Spring.

<sup>54</sup>Jack C. Rosenau, et. al., Springs of Florida, Florida Bureau of Geology, Tallahassee, FL. 1977, pg. 4. Spring classes are based upon their rate of discharge. The Bureau identifies eight classes, or magnitudes, of springs. First magnitude springs discharge an average of 100 cubic feet or more of water per second. Second magnitude springs discharge between ten and 100 cubic feet per second. Third magnitude springs discharge between one to 10 cubic feet per second. By way of comparison, eighth magnitude springs discharge less than one pint per minute. The regional plan recognizes all first, and second magnitude springs and their runs, a total of 105 springs, as Natural Resources of Regional Significance.



Ginnie Spring is a large clear water spring with depths to 40 feet and is one of the most popular scuba-diving springs in the region. Devil's Eye Spring is in the middle of three boils in one of the most beautiful combinations of springs in the state. The spring contains a multi-caved tunnel leading to the Santa Fe River.

## ii. Holton Spring and Holton Creek

Holton Spring and its run to the Suwannee River, Holton Creek, are located on the north side of the Suwannee River approximately one mile east of the Alapaha River in Hamilton County. Holton Spring is one of the region's ten first magnitude springs. More importantly, it is one of the few remaining first magnitude springs in a relatively undisturbed, natural state.<sup>55</sup> Endangered species found in the area include the gopher tortoise and Suwannee cooter. The area also contains the cedar elm, an endangered tree. The area contains the largest known population of cedar elm in Florida with an estimated 100 to 1,000 individual trees.<sup>56</sup>

## iii. Withlacoochee Blue Spring

Withlacoochee Blue Spring is approximately five miles east of the City of Madison on the west bank of the Withlacoochee River in Madison County. The site is widely used by Madison and Hamilton county residents for recreational activities. The spring has also gained a national reputation for cave diving.

Withlacoochee Blue Spring is a first magnitude spring with an average flow of 78 million gallons per day. The spring pool is 90 feet wide and 30 feet deep. A clear run travels approximately 150 feet from the spring to the Withlacoochee River. Vegetation around the spring consists of high pine lands and sandhills on the west giving way to a dense hardwood forest along the river. The vegetation is diverse with many large trees contributing to the aesthetic appearance of the site.<sup>57</sup>

# B. Problems, Needs and Opportunities

The Council identifies the following Natural Resources of Regional Significance problems, needs, and opportunities:

1. A need exists to preserve Big Bend coastal and marine resources identified as Natural Resources of Regional Significance for future generations.
2. A need exists to maintain an adequate supply of high-quality groundwater for all of north central Florida for future generations.
3. A need exists to increase our knowledge of the relationship between ground and surface waters, the surface water needs of native species and natural systems, including minimum flows necessary to the survival of native species and natural systems.

<sup>55</sup>Suwannee River Preserve Design Project, pg. 55.

<sup>56</sup>Ibid, pg. 55.

<sup>57</sup>Significant Natural Areas, pg. 69.



4. A need exists to protect all sources of recharge to the Floridan Aquifer from activities which would impair these functions or cause a degradation in the quality of recharging waters.
5. A need exists to ensure the survival of flora and fauna native to the region.
6. A need exists to ensure the survival of all listed species currently found in the Regional Ecological Greenways Network.<sup>58</sup>
7. A need exists for the state to protect the identified attributes of the habitats of listed species within the Regional Ecological Greenways Network.<sup>59</sup>
8. A need exists to plan and manage Planning and Resource Management Areas identified as Natural Resources of Regional Significance.
9. A need exists to maintain the quantity and quality of the region's surface water systems identified as Natural Resources of Regional Significance.
10. A need exists to map the capture zones of all springs identified as Natural Resources of Regional Significance.
11. An opportunity exists for state agencies and local governments to coordinate in the development of a comprehensive boating safety and resource protection plan for the Suwannee River System.
12. A need exists to balance environmental concerns with existing needs for raw materials by industry. The survival of the timber industry is very important to the region as it provides the reason to own and protect much of what is identified in this plan as a Natural Resource of Regional Significance. The use of Best Management Practices is important to the sustainability of forests.
13. A need exists to encourage growth of biomass within the region in light of increasing demand for biomass electrical power generation.
14. As our region contains very sizeable quantities of biomass material for renewable energy production, there is an opportunity to increase the acreage of forested lands, improve the ecological quality of forested lands and provide for renewable energy supplies.
15. There is a need to encourage the sustainability of our forests.

## C. Regional Goals and Policies

### 1. All Natural Resources of Regional Significance

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<sup>58</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.

<sup>59</sup>Ibid.



**REGIONAL GOAL 4.1.** Use the natural resources of the region in a sustainable manner.

**Regional Indicators**

1. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of silvicultural best management practices is unknown.
2. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of low impact development practices is unknown.
3. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of energy conservation design principles is unknown.
4. As of 2009, the number of north central Florida local government comprehensive plans and Developments of Regional Impact which encourage the use of water conservation and reuse strategies is unknown.
5. As of 2009, with the exception of intracounty groundwater transfer by Gainesville Regional Utilities, no interbasin transfer of water occurs in the region.
6. As of January 2010, north central Florida has 39 megawatts of electrical generation capacity using biomass as the primary fuel source.

**Policy 4.1.1.** Ensure that local government comprehensive plans and Developments of Regional Impact include provisions which encourage the use of silvicultural best management practices for silviculture uses within Natural Resources of Regional Significance.

**Policy 4.1.2.** Ensure that local government comprehensive plans and Developments of Regional Impact include provisions which encourage the use of low impact development practices within Natural Resources of Regional Significance.

**Policy 4.1.3.** Ensure that local government comprehensive plans and Developments of Regional Impact include provisions which encourage the use of energy conservation design principles in order to minimize demand on regional electric power generation facilities.

**Policy 4.1.4.** Ensure that local government comprehensive plans and Developments of Regional Impact include provisions which encourage the inclusion of water conservation and reuse strategies in order to minimize demand for surface water and groundwater Natural Resources of Regional Significance.

**Policy 4.1.5.** Discourage the transfer of water across water management district boundaries until the receiving jurisdiction has implemented all practicable water supply alternatives and conservation measures, unless it is within a county which is located within two water management districts.

**Policy 4.1.6.** Discourage the transfer of groundwater and surface water across water management district boundaries, as provided for in Policy 4.1.5, where the current and projected water needs of the area from where the water is taken cannot be met, unless it is within a county which is located within two water management districts.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**Policy 4.1.7.** Encourage cooperative efforts to develop local and regional water supplies within water management districts, instead of the transport of water across water management district boundaries, and use water from sources nearest the area of use whenever practicable.

**Policy 4.1.8.** Encourage water management districts to take into account and to not violate the minimum flows and levels of waterbodies located within adjacent water management districts when preparing water supply plans and when issuing consumptive use permits.

**Policy 4.1.9.** Ensure that local government comprehensive plans and developments of regional impact do not include provisions relying upon Regional Plan Policies 4.1.5 and 4.1.6 contained herein as encouragement or justification to require the issuance of a local government permit for the consumptive use of water or the exercise of any other local government regulatory action preempting or having the effect of preempting the exclusive authority of water management districts over the consumptive use of water as authorized by Chapter 373, Florida Statutes.

## 2. Coastal and Marine Resources

### a. Big Bend Salt Marsh, Big Bend Seagrass Beds and Florida Middle Ground

**REGIONAL GOAL 4.2.** Preserve Big Bend coastal and marine resources identified as Natural Resources of Regional Significance for future generations of residents in recognition of their economic and ecological importance to the region.

#### Regional Indicators

1. As of January, 2000, the Big Bend Salt Marsh (Dixie and Taylor County) coastline comprised 48,190 acres.
2. In 2001, that portion of the Big Bend Seagrass Beds extending 6 nautical miles seaward of the Dixie County and Taylor County coastline was comprised of 102,530.5 acres of bays and estuaries, 63,992.3 acres of open water, 7,638.6 acres of tidal flats, 11,515.0 acres of patchy seagrass, 192,556.6 acres of continuous seagrass, and 108,423.7 acres which were unclassified.<sup>60</sup>
3. In 1996, the Florida Middle Ground comprised 132,000 acres.
4. As of January 2007, a Florida Department of Health No-Fish-Consumption Advisory is in effect for the Fenholloway River due to elevated mercury levels in the river's of fish in the river.
5. As of April 2007, the Fenholloway River is in violation of U.S. Environmental Protection Agency water quality standards for dissolved oxygen, biochemical oxygen demand, un-ionized ammonia, fecal coliform and dioxin.
6. As of January 2007, there were 16 National Pollutant Discharge Elimination System stormwater facility permits and 8 National Pollutant Discharge Elimination System wastewater permits in Taylor

<sup>60</sup>North Central Florida Regional Planning Council, March 2007. Derived from Seagrass Habitat and Monitoring in Florida's Big Bend, Florida Fish and Wildlife Research Institute and Suwannee River Water Management District, 2006.



County. In 2006, there were 4 National Pollutant Discharge Elimination System stormwater facility permits and 2 National Pollutant Discharge Elimination System wastewater permits in Dixie County.

7. As of January 2007, the communities of Fanning Springs and Old Town were not serviced by a centralized wastewater treatment system.
8. As of January 2007, no offshore oil or natural gas wells are located within 100 miles of the Dixie and Taylor counties coastline.
9. As of January, 2007, no offshore oil or natural gas wells are located within the Florida Middle Ground.

**Policy 4.2.1.** Use non-structural water management controls as the preferred water management approach for the coastal areas of the region.

**Policy 4.2.2.** Provide technical assistance to local governments in ensuring the preservation of the region's coastal and marine resources through their local planning processes.

**Policy 4.2.3.** Minimize the need for excavating and/or filling of the region's coastal wetlands and ensure impacts are mitigated where such activity occurs.

**Policy 4.2.4.** Minimize the impacts of development activities which occur within and/or adjacent to the coastal wetlands.

**Policy 4.2.5.** Remove either the Big Bend Seagrass Beds or an area 35 miles seaward of the coastline of Dixie and Taylor Counties, whichever is of the greater seaward extent, from areas available for oil, gas and mineral leasing in the eastern Gulf of Mexico.

**Policy 4.2.6.** Remove the Florida Middle Ground from areas available for oil, gas and mineral leasing in the eastern Gulf of Mexico.

**Policy 4.2.7.** Minimize the need for establishing new channels and maintenance dredging of existing channels within the seagrass beds and mitigate impacts where such activity occurs.

**Policy 4.2.8.** Coordinate land use and water resources planning for coastal and marine resources designated as Natural Resources of Regional Significance among the Council, local governments, and the water management districts through regional review responsibilities, participation in committees and study groups, and ongoing communication.

**Policy 4.2.9.** Assist in environmental education efforts to increase public awareness of the region's coastal and marine resources through the North Central Florida Tourism Task Force.

**Policy 4.2.10.** Use incentives to encourage future development located within the service area of the unincorporated Town of Suwannee's wastewater treatment plant to hook up to the plant.

**Policy 4.2.11.** Monitor the entire Big Bend Seagrass Beds for a distance of six nautical miles seaward of the coastline and the Florida Middle Ground on a regular basis using a consistent methodology which provides meaningful trend analysis of their health and areal extent.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**Policy 4.2.12.** Ensure that local government comprehensive plans, developments of regional impact, and requests for federal and state funds for development activities reviewed by the Council include adequate provisions for the protection of the Beg Bend Salt Marsh and the Big Bend Seagrass Beds.

### 3. Groundwater Resources

#### a. Floridan Aquifer, Areas of High Recharge Potential to the Floridan Aquifer, Ichetucknee Trace, Stream-to-Sink Watersheds and Sinks

**REGIONAL GOAL 4.3.** Maintain an adequate supply of high-quality groundwater to meet the needs of north central Florida residents, in recognition of its importance to the continued growth and development of the region.

#### Regional Indicators

1. As of January 2002, the quantity of potable water contained in the Floridan Aquifer underlying the north central Florida region, its average daily recharge and discharge, were unknown.
2. In 2000, an estimated 232.2 million gallons per day of water were withdrawn from north central Florida groundwater sources.
3. As of January, 2002, north central Florida contained 26 first-magnitude springs, 101 second-magnitude springs, and 70 third-magnitude springs.
4. As of May 2007, the known Nitrate Nitrogen readings for north central Florida first magnitude springs, and their date of measure, were as follows (see Table 4.5):

**Policy 4.3.1.** Water management districts should monitor at regular intervals the water quality and flows of springs identified as Natural Resources of Regional Significance.

**Policy 4.3.2.** Continue to increase the region's knowledge of the relationship between ground and surface waters, the surface water needs of native species and natural systems, including minimum flows necessary to the survival of native species and natural systems.

**Policy 4.3.3.** Provide technical assistance to local governments in developing strategies in their local planning and land development regulations processes which can be used in addressing known water quantity, quality or recharge problem areas within their jurisdictions.

**Policy 4.3.4.** Coordinate land use and water resources planning for groundwater resources designated as Natural Resources of Regional Significance among the Council, local governments, and the water management districts through regional review responsibilities, participation in committees and study groups, and ongoing communication.

**Policy 4.3.5.** Assist in environmental education efforts to increase public awareness of the region's ground water resources through The Original Florida Tourism Task Force.

**Policy 4.3.6.** Identify and map the capture zones of all public water supply wellfields.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**Policy 4.3.7.** Provide technical assistance to local governments in implementing wellfield protection programs based upon capture zones delineated by either the Florida Department of Environmental Protection or the local water management districts when such information becomes available.

**Policy 4.3.8.** Ensure that local government comprehensive plans, developments of regional impact, and requests for federal and state funds for development activities reviewed by the Council include adequate provisions for the protection of the Floridan aquifer, Areas of High Recharge Potential to the Floridan aquifer, the Ichetucknee Trace, as well as Stream-to-Sink Watersheds and Sinks which have been identified and mapped in the regional plan as Natural Resources of Regional Significance.

**Policy 4.3.9.** Encourage local and regional development of alternative water supplies within south Georgia, the Suwannee River Water Management District and the St. Johns River Water Management District, including desalination, conservation, reuse of nonpotable reclaimed water and stormwater, as well as aquifer storage and recovery.

**REGIONAL GOAL 4.4.** Protect all sources of recharge to the Floridan aquifer from all activities which would impair these functions or cause a degradation in the quality of the water being recharged in recognition of the importance of maintaining adequate supplies of high-quality groundwater for the region.

#### Regional Indicators

1. As of January, 2011, the St. Johns River, the Suwannee River Water Management District, Alachua County, and Columbia County had identified and mapped 968,600.90 acres of areas of high recharge potential to the Floridan Aquifer within north central Florida.
2. In Fiscal Year 2005-06, there were 167,629 visitors to Ichetucknee Springs State Park.<sup>61</sup>
3. As of January, 2007, the Suwannee River Water Management District had identified and mapped 153,588 acres of stream-to-sink watersheds located within both its jurisdictional boundaries and within north central Florida.
4. In 2007, eight sinks were delineated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.

**Policy 4.4.1.** Coordinate the mapping of high recharge areas in order to assure consistency in identification of such areas near district boundaries.

**Policy 4.4.2.** Update the regional map series delineating Areas of High Recharge Potential to the Floridan Aquifer with a map series depicting High Recharge Areas of the Floridan Aquifer when the latter information becomes available.

**Policy 4.4.3.** Assist state and local agencies in developing and implementing strategies for the protection of the Ichetucknee Trace so that activities occurring within the Trace do not adversely impact the water quality and flow of surface waters within Ichetucknee Springs State Park.

**Policy 4.4.4.** Provide technical assistance to local governments in the development and implementation of appropriate local government comprehensive plan policies and land development regulations necessary

<sup>61</sup>2006 Florida Statistical Abstract, Table 19.52.



to maintaining the quantity and quality of ground water recharge in Areas of High Recharge Potential to the Floridan Aquifer, Stream-to-Sink Watersheds, and Sinks.

**Policy 4.4.5.** Ensure that local government comprehensive plans, developments of regional impact, and requests for federal and state funds for development activities reviewed by the Council include adequate provisions for stormwater management and aquifer recharge protection in order to protect the quality and quantity of water contained in the Floridan Aquifer.

**Policy 4.4.6.** Work with the water management districts to develop and apply coordinated review procedures and criteria for reviewing groundwater issues related to developments of regional impact, federally-assisted projects, local plan amendments and revisions, local comprehensive plan evaluation and appraisal reports, and local comprehensive plan intergovernmental coordination elements.

**Policy 4.4.7.** Minimize the effect of mining activities on water quality and quantity of the Floridan Aquifer.

## 4. Natural Systems

### a. Regional Ecological Greenways Network

**REGIONAL GOAL 4.5.** Protect all listed species within the Regional Ecological Greenways Network.<sup>62</sup>

#### Regional Indicators

1. As of September 2009 the Regional Ecological Greenways Network comprised 1,316,360 acres in north Central Florida.

**Policy 4.5.1.** Allow development and economic activity within and near the Regional Ecological Greenway to the extent that such development and economic activity does not significantly and adversely affect the functions of the resource as an ecological greenway.

**Policy 4.5.2.** Work with local governments and the Florida Fish and Wildlife Conservation Commission to ensure the survival of all listed species and their habitats found in the Regional Ecological Greenways Network.<sup>63</sup>

**Policy 4.5.3.** Increase citizen awareness on the effects of human activities on listed species and their habitats in the Regional Ecological Greenways Network.<sup>64</sup>

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<sup>62</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.

<sup>63</sup>Ibid.

<sup>64</sup>Loc. cit.



**Policy 4.5.4.** Coordinate planning efforts to protect listed species and their habitats found within the Regional Ecological Greenways Network.<sup>65</sup>

**Policy 4.5.5** Endangered and threatened species and their habitats within the Regional Ecological Greenways Network shall be protected.<sup>66</sup>

**Policy 4.5.6.** When a land use designation change is proposed or an increase in allowable land use density or intensity is proposed, listed species and their habitat known to exist within the Regional Ecological Greenways Network shall be protected. Protection should include, but not necessarily be limited to, the following:

- a) conservation easements;
- b) on and offsite mitigation/conservation banks;
- c) tax breaks;
- d) transferable densities;
- e) management agreements; and,
- f) agriculture and silviculture best management practices.<sup>67</sup>

**Policy 4.5.7.** Working with private property owners, encourage voluntary protection of listed species and their habitat located on private property within the Regional Ecological Greenways Network through the use of best management practices and public education programs.<sup>68</sup>

**Policy 4.5.8** Provide technical assistance to local governments in the development of appropriate local government comprehensive plan policies and land development regulations necessary to maintain the identified attributes of listed species and their habitat within the Regional Ecological Greenways Network.<sup>69</sup>

**Policy 4.5.9.** Support agricultural and silvicultural practices that maintain the function and value of natural systems through the use of best management practices.

**Policy 4.5.10.** Ensure that requests for federal and state funds, federal and state permits, and direct federal and state actions for development activities reviewed by the Council include adequate provisions for the protection of listed species and their habitat within the Regional Ecological Greenways Network.<sup>70</sup>

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<sup>65</sup>Loc. cit.

<sup>66</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.

<sup>67</sup>Ibid.

<sup>68</sup>Loc. cit.

<sup>69</sup>Loc. cit.

<sup>70</sup>Listed species means an animal species designated as Endangered, Threatened, or Species of Special Concern in Chapter 68A-27.003-68A-27.005, Florida Administrative Code; a plant species designated as Endangered, Threatened, or Commercially Exploited as designated in Chapter 5B-40, Florida Administrative Code, or an animal or plant species designated as Endangered or Threatened in Title 50, Code of Federal Regulations, Part 17.



**Policy 4.5.11.** Ensure that local government comprehensive plans include policies which, for developments within the Regional Ecological Greenways Network require an evaluation to determine the presence of listed species and their habitat and, if such species are found, require the development of a management plan, including modifications to the proposed development as necessary, to ensure the protection of listed species and their habitat.<sup>71</sup>

**Policy 4.5.12.** Ensure that local government comprehensive plans include policies which protect native vegetation and provides for the use of native vegetation, thereby promoting the regeneration of natural habitats within the Regional Ecological Greenways Network.

**Policy 4.5.13.** Within the Regional Ecological Greenways Network, when listed species and their habitat are identified on a Development of Regional Impact project site, prepare a listed species management plan to prevent and/or mitigate adverse impacts to listed species and their habitat, and prohibit development activities until the survey is conducted and the plan is approved by the Council and the local government of jurisdiction.<sup>72</sup>

## 5. Planning and Resource Management Areas

### a. Private Conservation Lands, Public Conservation Lands and Surface Water Improvement Management Waterbodies

**REGIONAL GOAL 4.6.** Protect Natural Resources of Regional Significance identified in this plan as "Planning and Resource Management Areas."

#### Regional Indicators

1. As of January 2011, north central Florida contained 2,640 acres of private conservation lands.
2. As of January 2011, north central Florida contained approximately 139,165 acres of federally-owned conservation lands.
3. As of January 2011, north central Florida contained 125,992 acres of state-owned conservation and recreation lands.
4. As of January 2011, north central Florida contained approximately 246,820 acres of water management District-owned conservation lands (including less than fee simple ownership).
5. In January 2011, north central Florida had 22 waterbodies identified as SWIM waterbodies.

**Policy 4.6.1.** Provide technical assistance to local governments in the development of appropriate local government comprehensive plan policies and land development regulations necessary to maintaining areas and water bodies identified as Natural Resources of Regional Significance classified in this plan as "Planning and Resource Management Areas".

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<sup>71</sup>Ibid.

<sup>72</sup>Loc. cit.



**Policy 4.6.2.** Seek the input of local governments and the regional planning council in the preparation of management plans for public conservation lands, private conservation lands, and SWIM water bodies identified as Natural Resources of Regional Significance.

**Policy 4.6.3.** Continue to provide input to state and local agencies in reviewing existing or proposed designations of areas or water bodies as one of the categories identified as Natural Resources of Regional significance classified in this plan as "Planning and Resource Management Areas".

**Policy 4.6.4.** Ensure that local government comprehensive plans, developments of regional impact, and requests for federal and state funds for development activities reviewed by the Council include adequate provisions for the protection of Planning and Resource Management Areas identified and mapped in the regional plan as Natural Resources of Regional Significance.

**Policy 4.6.5.** Ensure that Developments of Regional Impact located proximate to lands classified as Planning and Resource Management Areas in the regional plan do not increase costs for the control and removal of invasive exotic plant species within such areas by including conditions in Development of Regional Impact local government development orders which prohibit the planting of Category I Invasive Exotic Plant Species as classified by the Florida Exotic Pest Plant Council.

## 6. Surface Water Systems

### a. Fresh Water Wetlands, Lakes, River Corridors and Springs

**REGIONAL GOAL 4.7.** Maintain the quantity and quality of the region's surface water systems in recognition of their importance to the continued growth and development of the region.

#### Regional Indicators

1. As of January, 2000, the water management districts had identified 1,109,868 acres of fresh water wetlands within the region.
2. As of January, 2002, 10 north central Florida lakes were identified as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
3. As of January, 2002, 11 river corridors were designated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
4. As of January, 2002, 202,152 acres of river corridor were designated as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
5. As of January, 2011, 111 North central Florida springs were listed as Natural Resources of Regional Significance in the North Central Florida Strategic Regional Policy Plan.
6. In January, 2006, 12 north central Florida Natural Resources of Regional Significance were under a consumption advisory for Bowfin.
7. In January, 2006, 11 north central Florida Natural Resources of Regional Significance were under a consumption advisory for Large-mouth bass and Gar.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



8. In January, 2006, seven north central Florida Natural Resources of Regional Significance were under a consumption advisory for Redbreast Sunfish and Redear Sunfish.
9. In January, 2006, five north central Florida Natural Resources of Regional Significance were under a consumption advisory for Brown Bullhead.
10. In January, 2006, four north central Florida Natural Resources of Regional Significance were under a consumption advisory for Black Crappie, Bluegill, Channel Catfish, and White Catfish.
11. In January, 2006, three north central Florida Natural Resources of Regional Significance were under a consumption advisory for Spotted Sunfish.
12. In January, 2006, one north central Florida Natural Resource of Regional Significance were under a consumption advisory for Chain Pickerel and Warmouth.
13. As of June 2007, minimum flows and levels have been established for the lower Suwannee River, Madison County Blue Spring, and Fanning Spring.

**Policy 4.7.1.** Provide technical assistance to local governments in the development and implementation of appropriate local government comprehensive plan policies and land development regulations necessary to maintaining the quantity and high quality of the region's surface water systems.

**Policy 4.7.2.** Continue the mapping of river floodplains.

**Policy 4.7.3.** Update the regional map series delineating river floodplains as this information becomes available.

**Policy 4.7.4.** Work with north central Florida local governments to standardize on a common source for wetland maps contained in local government comprehensive plans.

**Policy 4.7.5.** Use non-structural water management controls as the preferred water management approach for rivers, lakes, springs, and fresh water wetlands identified as Natural Resources of Regional Significance.

**Policy 4.7.6.** Support the coordination of land use and water resources planning for surface water resources designated as Natural Resources of Regional Significance among the Council, local governments, and the water management districts through regional review responsibilities, participation in committees and study groups, and ongoing communication.

**Policy 4.7.7.** Assist in environmental education efforts to increase public awareness of the region's surface water systems through the North Central Florida Tourism Task Force.

**Policy 4.7.8.** Establish and enforce consistent boating safety zones along the Suwannee and Santa Fe rivers.

**Policy 4.7.9.** Assist local governments in establishing consistent regulations for development projects within river corridors identified as Natural Resources of Regional Significance.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



**Policy 4.7.10.** Identify and map the capture zones of all springs identified as Natural Resources of Regional Significance. Once delineated, provide technical assistance to local governments in implementing spring protection programs based upon capture zones.

**Policy 4.7.11.** Provide technical assistance to local governments in obtaining grants to establish centralized sewer systems in identified septic tank problem areas.

**Policy 4.7.12.** Ensure that local government comprehensive plans, developments of regional impact, and requests for federal and state funds for development activities reviewed by the Council include adequate provisions for stormwater management, including retrofit programs for known surface water runoff problem areas, and aquifer recharge protection in order to protect the quality and quantity of water contained in the Floridan Aquifer and surface water systems identified as Natural Resources of Regional Significance.

**Policy 4.7.13.** Work with local governments, state and federal agencies, and the local water management districts in the review of local government comprehensive plans and developments of regional impact as they affect wetlands identified as Natural Resources of Regional Significance to ensure that any potential adverse impacts created by the proposed activities on wetlands are minimized to the greatest extent possible.

**Policy 4.7.14.** Minimize the effect of mining on the surface water quality and seasonal flows of surface waters identified as Natural Resources of Regional Significance.

**Policy 4.7.15.** Encourage water management districts to monitor at regular intervals the quality and quantity of surface waters identified as Natural Resources of Regional Significance.

**Policy 4.7.16.** Assist water quality working groups formed to meet the water quality standards of waterbodies included in the State of Florida 303(d) list.



# Appendix C

## Maps of Natural Resources of Regional Significance

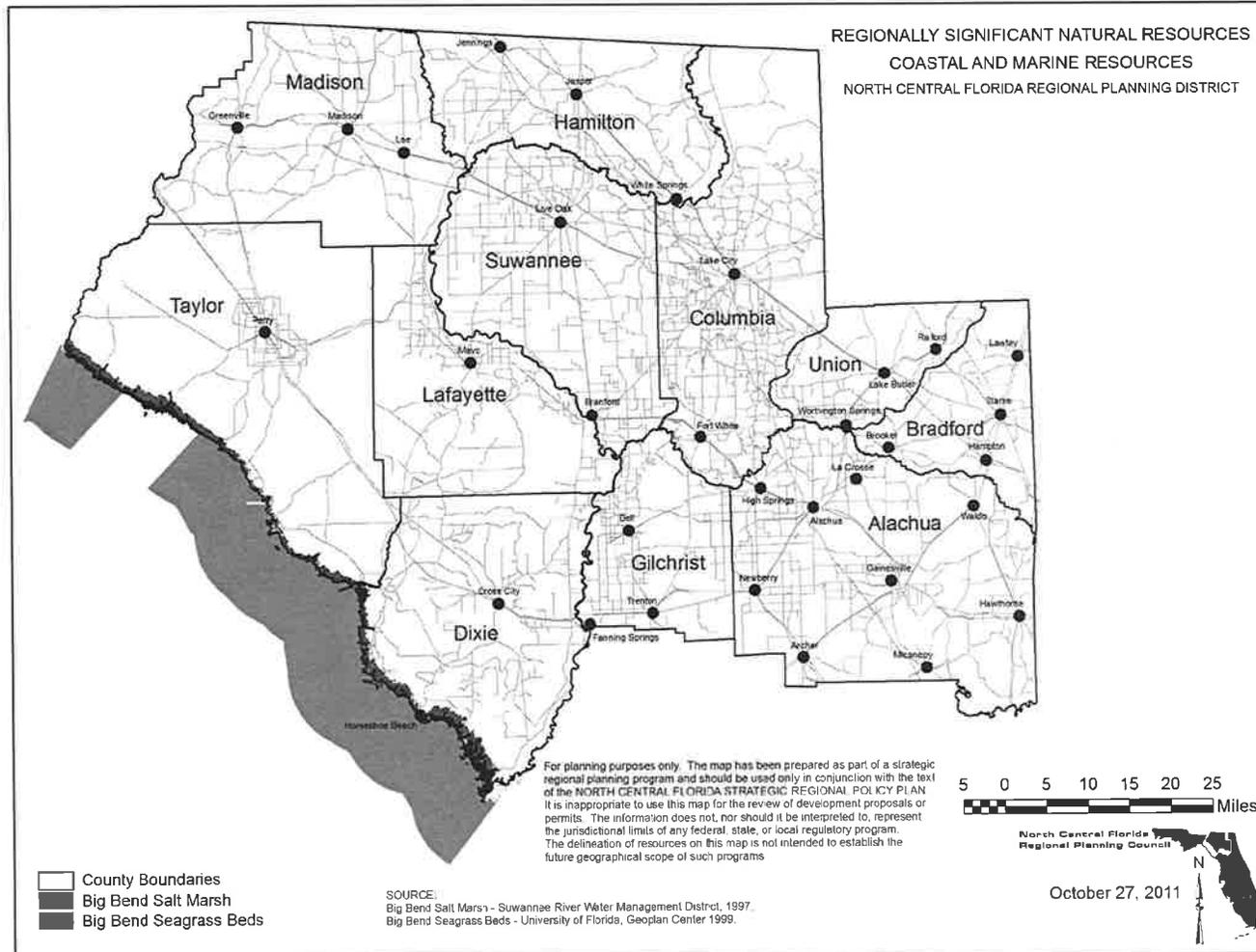
Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011



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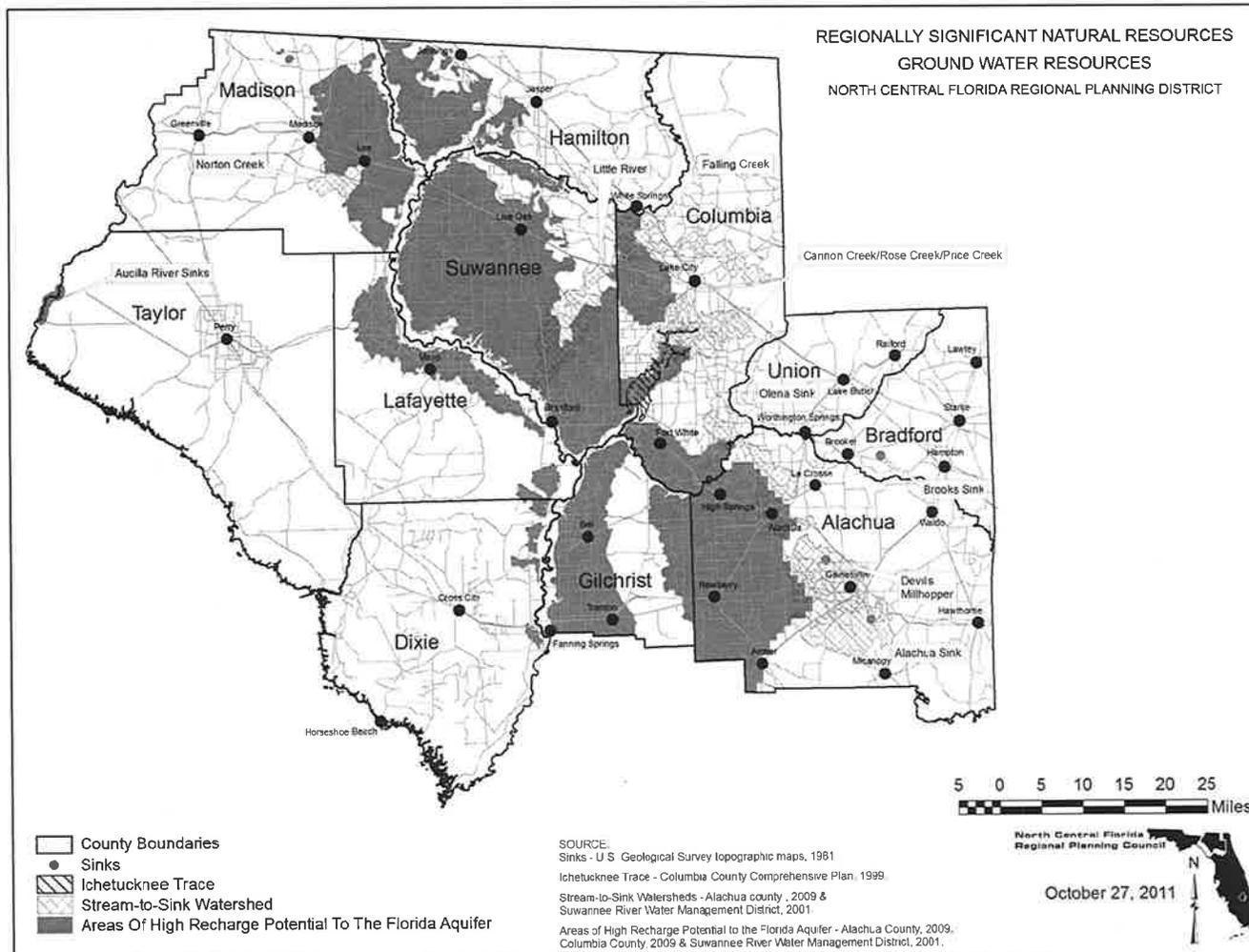
Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011

**Appendix C - Maps of Natural Resources of Regional Significance**



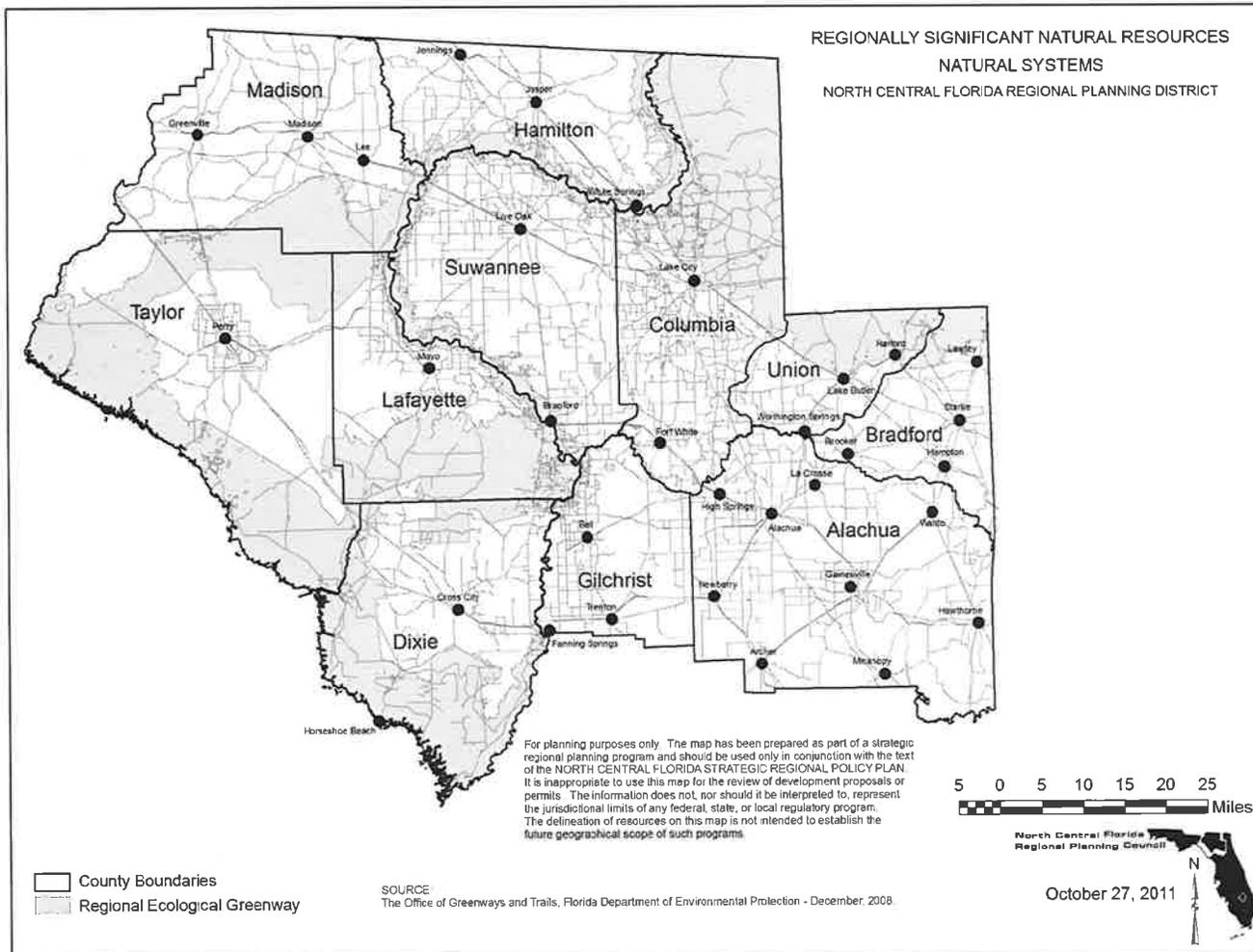
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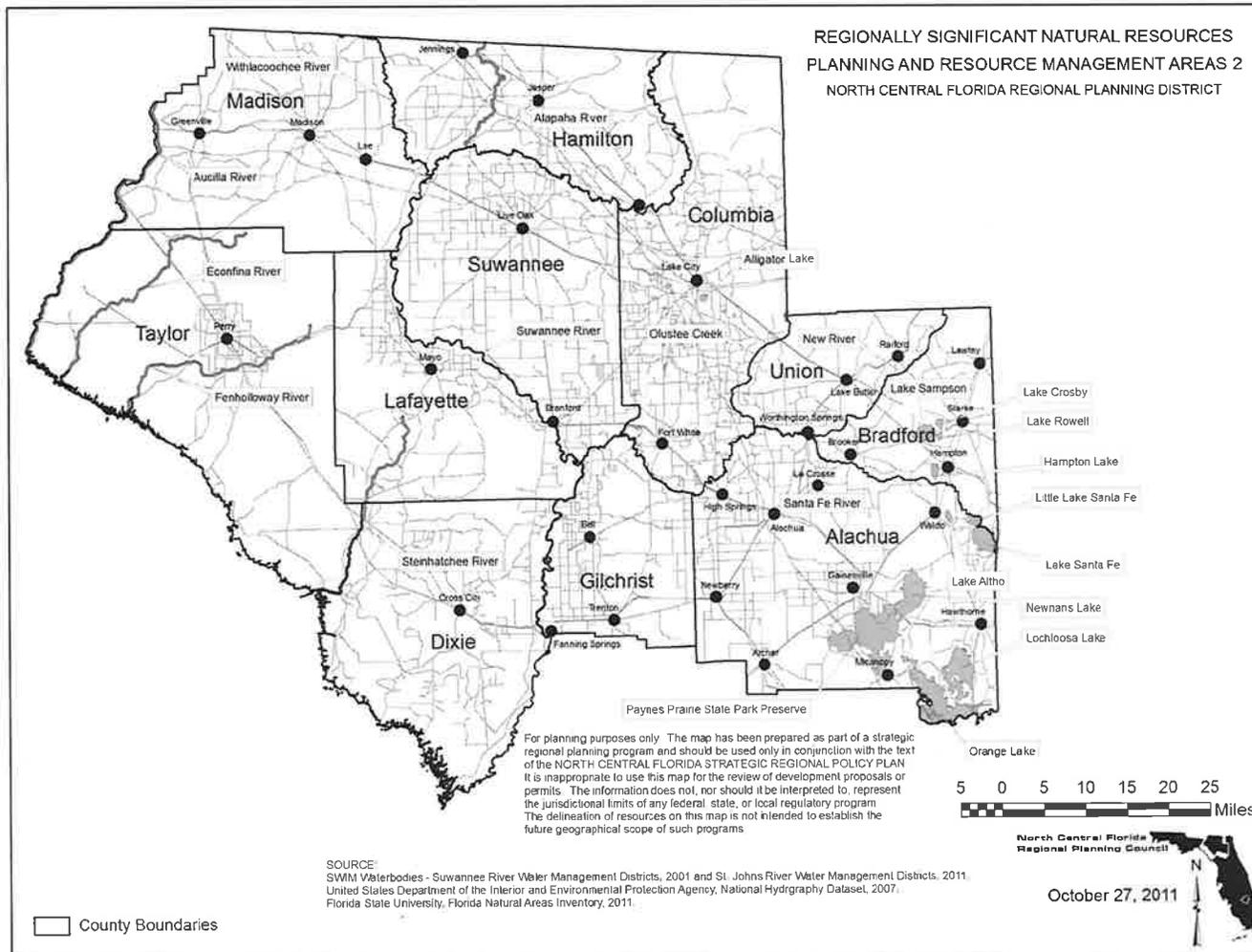
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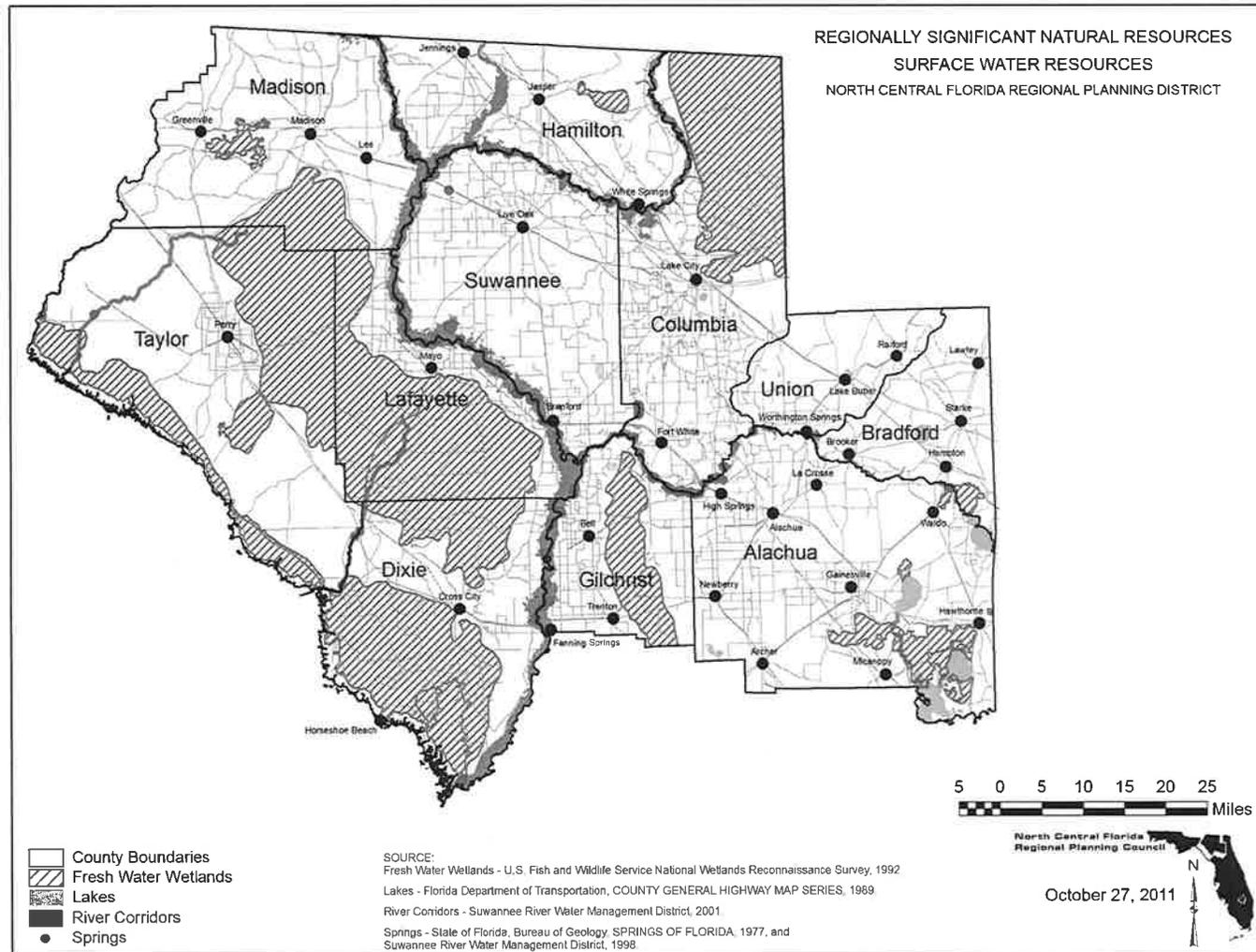
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Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003 and October 27, 2011