



b. House Price Cost Index

As shown in Table 2.21, housing prices in the region as well as the state remained a bargain relative to national average home prices. With the exception of Alachua County and Levy County, the relative cost of a home in the region was less than one-half that of the nation and significantly less than other areas of the state. From 2006 to 2015, the region as a whole declined slightly relative to the nation, while the overall relative prices of the state also declined by a larger amount.

Table 2.21

**Relative Housing Price
North Central Florida Region and State
National Index = 1.0
2006 to 2015**

Area	Year									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alachua	0.66	0.72	0.76	0.74	0.72	0.70	0.72	0.66	0.66	0.66
Bradford	0.58	0.57	0.55	0.50	0.46	0.44	0.44	0.44	0.45	0.45
Columbia	0.53	0.45	0.57	0.48	0.49	0.44	0.41	0.41	0.41	0.41
Dixie	0.50	0.49	0.48	0.44	0.40	0.38	0.38	0.38	0.38	0.38
Gilchrist	0.55	0.54	0.53	0.48	0.44	0.42	0.42	0.42	0.42	0.42
Hamilton	0.62	0.60	0.59	0.53	0.49	0.47	0.47	0.47	0.47	0.47
Lafayette	0.63	0.62	0.60	0.55	0.51	0.48	0.48	0.48	0.49	0.49
Levy	0.69	0.72	0.75	0.77	0.78	0.79	0.78	0.74	0.73	0.72
Madison	0.45	0.44	0.43	0.39	0.36	0.34	0.34	0.34	0.34	0.34
Suwannee	0.52	0.51	0.50	0.45	0.42	0.40	0.40	0.40	0.40	0.40
Taylor	0.49	0.48	0.47	0.42	0.39	0.37	0.37	0.37	0.37	0.37
Union	0.51	0.49	0.48	0.44	0.41	0.39	0.39	0.39	0.39	0.39
Region	0.61	0.64	0.67	0.63	0.62	0.59	0.60	0.56	0.56	0.57
Florida	0.80	0.78	0.76	0.73	0.67	0.66	0.64	0.64	0.65	0.65

Source: Regional Economic Modeling, Inc., PI+, Florida Counties, v. 1.3

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



c. Persons Living in Poverty

As shown in Table 2.22, the percentage of persons living in poverty in the region increased over the 2006 to 2015 period. However, the gap between the region and state decreased over the period, from 7.6 percent in 2006 to 6.2 percent in 2015. The largest increases in poverty rates in the region occurred in 2009 and 2012.

Table 2.22
Percent of Persons Living in Poverty
North Central Florida Region and State
2006 to 2015

Area	Year									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Alachua	21.8%	22.8%	20.0%	23.0%	25.3%	23.5%	26.6%	25.7%	21.6%	21.1%
Bradford	16.3%	16.9%	19.3%	22.5%	19.4%	23.1%	23.1%	21.8%	22.6%	21.3%
Columbia	18.2%	13.9%	18.0%	19.1%	19.5%	21.7%	23.4%	18.8%	21.7%	19.7%
Dixie	22.6%	21.6%	22.8%	23.7%	26.6%	25.2%	27.3%	27.1%	27.1%	29.3%
Gilchrist	17.6%	15.4%	16.8%	18.0%	21.0%	19.5%	22.0%	21.9%	19.8%	19.2%
Hamilton	24.3%	27.7%	29.3%	28.5%	30.8%	31.9%	28.9%	29.2%	31.7%	31.8%
Lafayette	22.3%	22.0%	25.6%	24.6%	26.0%	23.8%	26.4%	25.2%	25.6%	23.8%
Levy	17.8%	18.5%	17.8%	21.8%	27.0%	22.0%	22.7%	23.6%	21.2%	22.1%
Madison	20.9%	21.0%	23.6%	26.2%	23.4%	25.9%	25.6%	28.9%	27.7%	27.0%
Suwannee	18.1%	17.8%	19.9%	19.7%	20.9%	24.7%	28.1%	24.6%	23.7%	23.6%
Taylor	20.6%	18.5%	22.9%	23.8%	20.6%	22.7%	24.2%	23.9%	23.4%	21.2%
Union	19.4%	21.5%	23.6%	26.5%	24.3%	25.3%	26.2%	23.8%	24.3%	26.2%
Region	20.2%	20.2%	20.1%	22.3%	23.8%	23.4%	25.6%	24.4%	22.5%	22.0%
Florida	12.6%	12.1%	13.3%	15.0%	16.5%	17.0%	17.2%	17.1%	16.6%	15.8%

Source: U.S. Census Bureau, Small Area Income and Poverty Estimates
<<https://www.census.gov/did/www/saie/data/interactive/saie.html>>



B. Problems, Needs and Opportunities

1. Comprehensive Economic Development Strategy Priority Project Areas

The Comprehensive Economic Development Strategy Priority Project Areas serve as the roadmap for future economic development projects in the region and summarize the problems, needs and opportunities of the region. Additionally, future U.S. Economic Development Administration projects that fall within one of the priority project categories and are consistent with the goals and objectives of the Comprehensive Economic Development Strategy will be eligible for funding from the U.S. Economic Development Administration.

1. Talent Supply and Education - Support the development of educational programs to increase the labor force in the healthcare and life sciences industry.
2. Innovation and Economic Development - Support the development of the catalyst sites for the North Central Florida Rural Area of Opportunity and the development and expansion of regional business incubators and research parks.
3. Infrastructure and Growth Leadership - Support continuing improvements to multi-modal infrastructure, including highway interchanges along interstate corridors, railway corridors, airport facilities and broadband infrastructure.
4. Business Climate and Competitiveness - Support streamlining processes at the local level to encourage new businesses to open and help existing businesses thrive.
5. Civic and Governance Systems - Support programs to educate local government officials in the fundamentals of economic development.
6. Quality of Life and Quality Places - Support regional tourism promotional initiatives.



C. Goals and Objectives

The Economic Development Element establishes the goals and policies necessary to solve the economic problems and capitalize on the resources of the region. The goals and policies are organized using the Florida Chamber Foundation's Six Pillars of Florida's Future Economy.

1. Talent Supply and Education

REGIONAL GOAL 2.1. Connect and align education and workforce development programs to develop the region's current and future talent supply chain and meet employer needs.

Regional Indicator

For the 2014- 2015 school year, the high school graduation rate of the region was 74.3 percent.

Policy 2.1.1. Expand options for high school students to become industry certified while still in high school, as an alternative to college path.

Policy 2.1.2. Integrate education, training and workforce development to develop a strong supply chain.

Policy 2.1.3. Support efforts by Florida Gateway College, North Florida Community College, Santa Fe College, CareerSource Crown, CareerSource North Florida and CareerSource North Central Florida to expand education programs in healthcare related fields and create a marketing strategy to promote enrollment in health professions programs.

Policy 2.1.4. Support the creation of electronic medical records education and training programs utilizing a regional community-adaptive health information technology model.

REGIONAL GOAL 2.2 Expand access to education and training programs for talent in distressed markets (e.g., rural, urban core) throughout the region.

Policy 2.2.1. Support the creation of online and distance learning programs for students that lack other means of attaining necessary training.

Policy 2.2.2. Support the development of educational programs to increase the labor force in the healthcare and life sciences industry.



2. Innovation and Economic Development

REGIONAL GOAL 2.3. Grow, sustain and integrate efforts related to research and development, technology commercialization, and seed capital, to create, nurture and expand regional innovation businesses.

Regional Indicator

In 2015, there were 12,056 jobs in the region in the Professional, Scientific, and Technical Enterprises industry.

Policy 2.3.1. Support development of the Innovation Square research and development park in Gainesville, the integration of the University of Florida's research enterprise and commercialization programs into the fabric of the Innovation Square project through the Florida Innovation Hub at the University of Florida and Progress Park in Alachua.

Policy 2.3.2. Support the development of existing and new business incubators and accelerators throughout the region such as the Gainesville Technology Entrepreneurship Center, the Santa Fe Center for Innovation and Economic Development in Gainesville and the Sid Martin Biotechnology Incubator in Alachua.

Policy 2.3.3. Support the development of existing and new industrial parks throughout the region such as Cornerstone in Gainesville..

REGIONAL GOAL 2.4. Increase the number of regional businesses engaged in selling goods and services internationally and the diversification of the markets they serve.

Regional Indicator

In 2015, the region experienced a net trade export deficit of goods and services of \$294 million.

Policy 2.4.1. Provide educational opportunities to regional businesses interested in international trade on the advantages of exporting their goods and services.

REGIONAL GOAL 2.5. Brand and market the north central Florida region as the best location for business.

Regional Indicator

As of January 2016, the North Central Florida Regional Planning Council was a member of the North Florida Economic Development Partnership.

Policy 2.5.1. Support the North Florida Economic Development Partnership asset mapping and geographic information system projects in the region.



Policy 2.5.5. Support the development of the Enterprise Florida/Rural Economic Development Initiative Catalyst Sites located in Columbia County and Suwannee County by pursuing funding sources for the infrastructure necessary to develop the catalyst sites to shovel ready status.

REGIONAL GOAL 2.6. Promote the continued viability of military installations in close proximity to the region.

Regional Indicator

As of January 2016 the North Central Florida Regional Planning Council continues to review local government comprehensive plans, plan amendments, and other items for adverse impacts to military installations either within or in close proximity to the region.

Policy 2.6.1. Improve collaboration between local government and military leaders to utilize best management practices that ensure successful economic partnerships.

Policy 2.6.2. Support the development of the catalyst sites for the North Central Florida Rural Area of Opportunity.

Policy 2.6.3. Support the development and expansion of regional business incubators and research parks.

3. Infrastructure and Growth Leadership

REGIONAL GOAL 2.7. Modernize the transportation, telecommunications, energy, water and wastewater systems of the region to meet future demand and respond to changing business needs.

Regional Indicator

As of 2015, the nonresidential actual capital stock of the region was valued at \$19.6 billion.

Policy 2.7.1. Support the development of diverse, reliable and cost effective energy sources and systems to meet the region's economic and environmental goals.

Policy 2.7.2. Ensure the future supply and quality of water to meet the region's economic and quality of life goals by encouraging the use of the groundwater resources of the region in a sustainable manner and by strengthening local control of area surface and groundwater systems and supplies.

Policy 2.7.3. Develop and maintain a cutting-edge telecommunications infrastructure by supporting initiatives to bring high-speed internet service to the rural areas of the region.

Policy 2.7.4. Develop and maintain multimodal, interconnected trade, logistics and transportation systems to enhance freight mobility in support of a prosperous, competitive economy.



Policy 2.7.5. Support the continued development of the Gainesville Regional Airport as part of the State's Strategic Intermodal System and promote the designation of the Lake City Municipal Airport as part of the State's Strategic Intermodal System.

REGIONAL GOAL 2.8. Improve coordination of economic development, land use, infrastructure, water, energy, natural resources, workforce and community development decision-making and investments at the regional level.

Regional Indicator

As of January 2016, the North Central Florida Regional Planning Council continues to review local government comprehensive plans, applications for federal funds and direct federal actions for adverse impacts to Natural Resources of Regional Significance, regional facilities, and affected local governments.

Policy 2.8.1. Improve collaboration and alignment between regional and local agencies and business leaders through a regional vision.

Policy 2.8.2. Support continuing improvements to multi-modal infrastructure, including highway interchanges along interstate corridors, railway corridors, airport facilities and broadband infrastructure.

Policy 2.8.3. Identify economic development projects that may qualify for federal and state funding opportunities and provide grant writing and administrative services where needed.

Policy 2.8.4. Provide technical assistance in the form of economic impacts analysis, research and best practices to local economic development organizations and government agencies.

Policy 2.8.5. Facilitate coordination between regional economic development strategies and the state five-year economic development plan.

4. Business Climate and Competitiveness

REGIONAL GOAL 2.9. Streamline permitting, development and other regulatory processes at the local level to meet changing business needs and provide a predictable legal and regulatory environment in the region.

Regional Indicator

As of January 2016, the North Central Florida Strategic Regional Policy Plan contains goals and policies encouraging the streamlining of permitting and regulatory processes.

Policy 2.9.1. Reduce barriers to small business and entrepreneurial growth.

Policy 2.9.2. Develop a government revenue structure that encourages business growth and development.



Regional Goal 2.10. Ensure local government agencies provide collaborative, seamless, consistent and timely customer service to regional businesses.

Regional Indicator

As of January 2016, the North Central Florida Strategic Regional Policy Plan contains goals and policies encouraging the streamlining of permitting and regulatory processes.

Policy 2.10. 1. Work with water management districts in the region to simplify permitting process for new and expanding businesses.

REGIONAL GOAL 2.11. Expand opportunities for access to capital for businesses throughout their life cycle.

Regional Indicator

As of January 2016, the Council reviews applications for federal grants and loans.

Policy 2.11.1. Create a database of capital sources available to regional businesses.

REGIONAL GOAL 2.12. To enhance the resilience of the north central Florida economy in the face of natural disasters and changes to the national and state economies through increased awareness and preparation by businesses for environmental risks.

Regional Indicator

As of January 2016, all north central Florida local governments are signatories to the Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery.

Policy 2.12.1. Educate government and businesses on continuity and recovery plans in the event of natural or man-made disasters to address workforce retention and ensure access to loan and other assistance programs.

5. Civic and Governance Systems

REGIONAL GOAL 2.13. Support and sustain regional partnerships to accomplish the region's economic and quality of life goals.

Regional Indicators

1. As of January 2016, the North Central Florida Regional Planning Council is a member of the North Florida Economic Development Partnership as well as the Florida Economic Council.
2. As of January 2016, the North Central Florida Regional Planning Council serves as staff to the Metropolitan Transportation Planning Organization for the Gainesville Urbanized Area, the North Central Florida Comprehensive Economic Development Strategy Committee and The Original Florida Tourism Task Force.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



Policy 2.13.1. Utilize the North Florida Economic Development Partnership's Economic Development Academy as a vehicle to provide a functional understanding of economic development concepts to local elected officials.

Policy 2.13.2. Work with the Florida Association of Counties and the Florida League of Cities to add economic development information to their curriculums for newly elected officials.

Policy 2.13.3. Invest in strategic regional economic development priorities.

Policy 2.13.4. Support programs to educate local government officials in the fundamentals of economic development

Policy 2.13.5. Conduct regular meetings of the Comprehensive Economic Development Strategy Committee to monitor the status of regional projects and Comprehensive Economic Development Strategy implementation. District staff will actively participate in economic development activities in the region and provide technical assistance when needed.

Policy 2.13.6. Support the North Florida Economic Development Partnership and the development of the North Central Florida Rural Area of Opportunity Catalyst Sites in Columbia and Suwannee Counties by serving on the Partnership's Board of Directors and providing technical assistance when necessary.

6. Quality of Life and Quality Places

REGIONAL GOAL 2.14. Ensure future growth and development decisions maintain a balance between sustaining the region's environment and enhancing the region's economy and quality of life.

Regional Indicator

As of January 2016, the North Central Florida Regional Planning Council continues to review local government comprehensive plans, applications for federal funds and direct federal actions for adverse impacts to Natural Resources of Regional Significance, regional facilities, and affected local governments.

Policy 2.14.1. Create and sustain vibrant, healthy communities that attract workers, businesses, residents and visitors to the region.

Policy 2.14.2. Promote and incentivize local government in the development of vibrant city centers.



REGIONAL GOAL 2.15. Promote, develop, and leverage the region's natural and cultural assets in a sustainable manner.

Regional Indicator

As of January 2016, the North Central Florida Regional Planning Council provides staff services to The Original Florida Tourism Task Force.

Policy 2.15.1. Support the efforts of the Original Florida Tourism Task Force and other regional tourism marketing organizations to develop sustainable tourism-based economic development programs and increase the entrepreneurial capacity of the hospitality industry.

Policy 2.15.2. Improve the branding and awareness of the region as a tourism destination by leveraging regional resources with VISIT FLORIDA, the State's official tourism marketing organization.

Policy 2.15.3. Promote and support the state parks within the region and improve branding and awareness of the parks as a tourist destination.

Policy 2.15.4. Promote sustainable economic development through regional tourism promotion, while encouraging the preservation of resources that bring visitors to the area. The North Central Florida Economic Development District will provide professional staffing services to the Original Florida Tourism Task Force to implement their regional marketing strategies.



Chapter III

Emergency Preparedness

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



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Chapter III: Emergency Preparedness

A. Conditions and Trends

1. Introduction

It was a cool, windy Friday, typical of the month of March in north central Florida. The National Weather Service was predicting the possibility of severe storms, particularly in Dixie and Taylor counties. Still, the weather forecast was nothing out of the ordinary and life went on as usual in the coastal fishing communities dotting Dixie and Taylor counties. Residents went to bed early, as they usually do in anticipation of an early morning fishing excursion. The rain came down hard with plenty of wind. It was so windy that electricity and telephone service was knocked out. Yes, it was a big storm, but how bad could it be? After all, it wasn't hurricane season and no evacuation order had been issued.

Hud Lillion and Laurie O'Quinn from the unincorporated Taylor County coastal community of Dekle Beach remember the night well. "After watching the water for a while I went to bed," said Hud. "I woke up about 2:00 a.m. and looked out and saw water up on the tires of my truck but it didn't particularly alarm me, so I went back to bed. Laurie woke up about 2:30 a.m. and told me Louis Lanier's house was gone and so was my truck. I knew then that this was more than just a storm, so we moved to the back of the house. Every wave that came in was knocking the boards up in the floor. I told Laurie we had to get out. I made my way to the back door. I fell through the floor two or three times. I couldn't hardly get the door open because of the wind and the door started smashing Laurie's hand."

"We finally got out on the deck, then everything started collapsing so we jumped. We swam across the road to a home that was still standing and managed to get up on the deck. We managed to get inside and tried to find some life jackets, then that house started crumbling but we managed to get on the roof. A wave came and knocked off the roof. We grabbed hold of a board and floated up to Carlton Hamilton's home. It was still dark then, about 5:30 a.m. We stayed there for some minutes. Mrs. Sapp was there holding a baby.¹ We all huddled together to try and stay warm but we were freezing. Fred Morgan and Tom Geohagen came wading in waist deep water. The wind was still blowing about 65 mph. They took us to Craig and Ruth Harvey's house where some other people had gathered and there was a fire in the fireplace. We were just glad to be alive."¹⁴ At 5:42 a.m. a weather forecaster in Tampa went on a statewide emergency radio network to issue a flood warning.¹⁵

¹O'Quinn floated until she was able to grab another house, and that's when the woman swam by with a baby in her arms. "She said, 'help me, my baby is dead,' and we just stood there and hugged each other until Fred and Tom came and got us out." "Counting People Instead of Bodies," Gainesville Sun, March 15, 1993.

¹⁴TaCo Times, Perry, Florida, March 17, 1993

¹⁵"Why the Delay in Storm-Surge Warning?" Gainesville Sun, March 19, 1993.

John Robertson was huddled in his travel trailer, listening to the rain and reading a mystery novel, when the owners of the nearby Keaton Beach Marina knocked on his door and told him he should join them in the marina's second-floor living quarters. "I'm 6-foot-4 and by the time I got to the marina I was swimming," Robertson said. "There is total destruction here. Just about everything is lost." Marina co-owner Brad Beach said a tidal surge caused the water to rise about 6 feet in 20 minutes before dawn Saturday, and it ebbed just as quickly. During its short stay, the surge crumbled concrete foundations, flooded buildings, immersed vehicles and took homes, docks, and other structures with it as it retreated. "I never saw anything like it in my life," Beach said, "It took just 20 (minutes) to get 6 feet, and then there were 4- to 5-foot waves on top of it. Houses finally floated away."¹⁶

In just 20 minutes Saturday morning, March 13, 1993, north central Florida coastal residents went from just another spring storm to the Storm of the Century. The storm devastated the region's entire coastline. Fully 25 percent of the region's coastal homes were destroyed and another 25 percent were damaged. Dixie County was lucky. No one died. Taylor County was not. Ten people drowned. On March 13th, President Clinton declared Florida a disaster area.

Predicting the severity of the storm and the height of the tide surge was difficult for the National Weather Service. The storm could not have occurred except for a unique set of circumstances. The storm developed suddenly late Friday as incoming Arctic air collided with a warm air stationary front over the Gulf of Mexico. The difference in temperature between the two air masses was estimated at 50 degrees. The dramatic contrast in air temperatures allowed the storm to develop very rapidly. A dramatic drop in barometric pressure followed. The storm produced the lowest barometric pressure ever recorded in the City of Tallahassee. Drops in barometric pressure are normally associated with tropical storms, which this was not. The drop in barometric pressure led to high winds. The region experienced a high tide when the storm hit land. These factors combined to produce a storm surge that surpassed forecasters predictions.¹⁷

Dixie and Taylor County coastal residents were unlikely to hear an evacuation warning had the weather service issued one. Neither Dixie nor Taylor County officials had access to the National Warning System radio network. Both counties were outside the range of the National Oceanic and Atmospheric Administration weather radio station network and neither county had emergency sirens.

2. Planning for Coastal Storms

As a result of the Presidential disaster declaration for the Storm of the Century, the President activated an Interagency Hazard Mitigation Team to identify areas of significant hazards, visit sites, and evaluate the impact of the disaster. The team was comprised of representatives of federal, state, regional, and local agencies who possess the varied backgrounds and expertise necessary to promote a comprehensive approach to hazard mitigation. The team issued a report containing 25 recommendations which describe the actions, time-lines, and potential funding sources necessary to reduce future losses from similar events. Among the team's findings were recommendations for the installation of additional weather monitoring equipment in coastal areas to help weather forecasters better predict storm events as well as a better warning system for coastal residents.

¹⁶"Taylor County Beach Residents Return to Ruins," Gainesville Sun, March 16, 1993.

¹⁷"Weather Still Hard to Predict," Gainesville Sun, March 17, 1993.



North central Florida National Oceanic and Atmospheric Administration weather radio signals coverage has been significantly expanded since the Storm of the Century. Computer-generated National Oceanic and Atmospheric Administration weather radio coverage maps developed by the National Oceanic and Atmospheric Administration suggest that, with the exception of a small area parallel to Interstate 10 in Madison County, all of north central Florida is covered by at least one of the weather radio stations identified in Table 3.1, below.

TABLE 3.1

**NORTH CENTRAL FLORIDA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WEATHER RADIO COVERAGE**

Location	Station	Broadcast Frequency	Counties Covered or Partially Covered
Lake City	KEB-97	162.400mHz	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Lafayette, Suwannee, Union
Tallahassee	KIH-24	162.400mHz	Madison, Taylor
Palatka	WNG-522	162.425mHz	Alachua, Bradford
Salem (Taylor County)	WWF-88	162.425mHz	Dixie, Lafayette, Madison, Suwannee, Levy, Taylor
Morrison (Citrus County)	KWN38	162.55mHz	Alachua, Bradford, Columbia Dixie, Gilchrist, Hamilton, Lafayette, Levy, Taylor, Union
Gainesville	WXJ-60	162.475mHz	Alachua, Bradford, Columbia, Dixie, Gilchrist, Lafayette, Suwannee, Union
Valdosta, GA	WWH-31	162.500mHz	Hamilton, Madison, Suwannee
Ocala	WWF-85	162.525mHz	Alachua, Levy

Source: www.nws.noaa.gov/nwr/usframes.html, November 2010.

The National Oceanic and Atmospheric Administration weather radio website notes that the coverage maps were calculated using a computer model and station data using ideal weather conditions. The National Oceanic and Atmospheric Administration notes that coverage may be 5 to 10 percent less than indicated by the maps. Suwannee County Emergency Management personnel have noted that, since the Live Oak National Oceanic and Atmospheric Administration weather radio station was moved to Lake City in 2004, Suwannee County does not receive reliable coverage west of U.S. Highway 129, at least during periods of inclement weather. Upgrading the existing 300-watt National Oceanic and Atmospheric Administration

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weather radio station in Lake City to a 1,000-watt station may provide the necessary coverage for the remaining unserved areas of Suwannee County.

During the Storm of the Century, the statewide emergency warning system consisted of a dedicated telephone system linking federal and state weather forecasters with local governments. The system allows for two-way conversation similar to a telephone system party-line. Few local governments in north central Florida were connected to this system due to its high installation and maintenance costs. A sophisticated satellite-based communications system has replaced it, linking emergency management agencies throughout the state to provide voice, high-speed data, facsimile, and video communications capabilities. It is more reliable than the National Warning System since it is not dependent upon telephone lines and will perform under any weather conditions. The system has been installed in every county, solving a missing link in north central Florida emergency management capabilities.

At the time of the storm, no weather buoys or other government-owned weather monitoring instruments were located in the Gulf of Mexico off the Big Bend coastline. Weather buoys provide valuable information regarding temperature, wind speed, wind direction, and barometric pressure. Meteorologists can run computer models that predict storm surge height based upon these factors.

Storm surge increases in height as it nears land. As of 2015, one Coastal-Marine Automated Network coastal weather station is located in Keaton Beach, three weather buoys are located between 51 and 100 miles of Steinhatchee, two weather buoys are located between 101 and 150 miles of Steinhatchee, and four weather buoys are located in the Gulf of Mexico between 151 to 175 miles of Steinhatchee. However, no weather buoys are located in the Gulf of Mexico between 10 and 50 miles of Steinhatchee.

Dixie Levy and Taylor counties have six small coastal communities: the unincorporated coastal communities of Jena-Steinhatchee, Dekle Beach-Keaton Beach, Suwannee, and the incorporated municipalities of Cedar Key, Horseshoe Beach and Yankeetown. Warning sirens can be useful means of notifying community residents of storm warnings and evacuation orders when other forms of communication fail. During the Storm of the Century, none of these communities had warning sirens. As of 2015, six north central Florida coastal communities (Cedar Key, Horseshoe Beach, Dekle Beach, Keaton Beach, Steinhatchee, and Yankeetown) had emergency warning sirens. The unincorporated communities of Suwannee and Jena do not have sirens, However, Dixie County has installed a "Reverse 911" notification system which is capable of notifying Dixie County coastal residents who have telephone service of approaching coastal storms.

As was evident in the Storm of the Century, the greatest danger to coastal areas is the storm surge, a 20- to 100-mile wide wall of water generated by high winds, hurricane forward velocity, and sharp changes in barometric pressure present in coastal storms. Storm surges cause nine out of ten hurricane fatalities. Dixie, Levy and Taylor counties are among the most susceptible counties in the state and, perhaps, the nation, to inundation from storm surge. This is due to the geomorphology and the bathymetry of the Gulf of Mexico. Dixie, Levy and Taylor counties are located near the Florida panhandle where the coast curves west, creating a corner which can trap sea water. Along a straight coastline, the surge can dissipate more easily by flowing parallel to the coastline. However, in Dixie, Levy and Taylor counties, the seawater is trapped in Apalachee Bay where it piles up rather than flows out. The bathymetry, or sea bottom topography, of the gulf of Mexico is much shallower than most other U.S. coastal basins. A shallow basin can increase surge height by as much as 80 percent.¹⁸

¹⁸North Central Florida Regional Planning Council, 1990 North Central Florida Regional Hurricane Inland Shelter Study Technical Report Update, Gainesville, Fl., 1990, pg. 10.



The potential loss of life and property damage due to hurricanes in Dixie, Levy and Taylor Counties is minimized due to their small populations and large coastal land holdings in public ownership. The 2008 Dixie County estimated population was 15,965, the 2008 Levy County estimated population was 40,817 while 2008 Taylor County estimated population was 23,199. Population density is low in these counties. The 2008 Dixie County population density was 23 persons per square mile, ranked at 62 among Florida's 67 counties. The Levy County population density was 36 persons per square mile, ranked 55th. Taylor County had an estimated 2008 population density of 22 persons per square mile, ranked at 64th among Florida's counties.¹⁹ Additionally, approximately two-thirds of the Dixie, Levy and Taylor counties coastline is in public ownership.

a. Clearance Times and Shelter Capacities

In 2015, the North Central Florida Regional Planning Council updated portions of the Statewide Regional Evacuation Study for the region. The evacuation study reports average clearance times by "Level." A "level" is comparable to the Category 1-5 Saffir-Simpson Hurricane classification system, with Level A comparable to a Category 1 hurricane and a Level E hurricane comparable to a Category 5 hurricane.

The evacuation study also identified clearance times to three separate destinations: Clearance Time to Shelter; In-County Clearance Time, and Out of County Clearance Time. Clearance Time to Shelter refers to the time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" within the county based on a specific hazard, behavioral assumptions and evacuation scenario. Calculated from the point in time when the evacuation order is given to the point in time when the last vehicle reaches a point of safety within the county. In-County Clearance Time refers to the time required from the point an evacuation order is given until the last evacuee can either leave the evacuation zone or arrive at safe shelter within the county (excludes evacuees leaving the county, on their own). Out of County Clearance Time refers to the time necessary to safely evacuate vulnerable residents and visitors to a "point of safety" outside the county. It is calculated from the time an evacuation order is given to the time when the last vehicle assigned an external destination exits the county.

The general response model, post-hurricane behavioral surveys of residents of the north central Florida region and past experience were used to determine public shelter demand. The number of evacuees who choose public shelter as their evacuation destination was based on demographic characteristics of the population including income and age, risk area and housing (mobile home vs. site built homes). The planning assumptions regarding anticipated shelter use were based upon the behavioral surveys and past experiences and were applied to the projected hurricane evacuation population estimates.

Several different assumptions were used regarding the evacuation population. The base scenarios used for planning and growth management purposes assume that 100 percent of the population-at-risk evacuates plus a smaller percentage of non-vulnerable population referred to as shadow evacuation.

¹⁹Bureau of Economic and Business Research, 2009 Florida Statistical Handbook, University Press of Florida, Gainesville, FL., 20010, Table 1.14.



TABLE 3.2

2015 CLEARANCE TIMES FOR BASE SCENARIO

County	Clearance Times by Level (in Hours)				
	Level A	Level B	Level C	Level D	Level E
Clearance Time to Shelter					
Dixie	13.0	13.0	13.0	13.5	13.0
Levy	13.0	13.0	13.0	13.0	13.0
Taylor	13.0	13.0	13.0	13.0	13.0
In-County Clearance Time					
Dixie	13.0	13.0	13.0	13.0	13.0
Levy	14.0	17.0	23.5	24.5	27.0
Taylor	13.0	13.0	13.0	13.0	14.5
Out of County Clearance Time					
Dixie	13.0	13.0	13.0	13.0	13.0
Levy	22.0	26.0	32.5	34.5	36.0
Taylor	14.0	14.0	14.0	14.0	14.5

Source: 2015 Statewide Regional Evacuation Study for the North Central Florida Region, Volume 1: Technical Data Report, North Central Florida Regional Planning Council, September 2015

Table 3.3 below identifies risk shelter capacities for north central Florida counties.

TABLE 3.3

**NORTH CENTRAL FLORIDA PUBLIC SHELTER CAPACITY
USING AMERICAN RED CROSS PUBLIC SHELTER GUIDELINES**

County	Shelter Capacity	Category A Surplus or (Deficit)	Category B Surplus or (Deficit)	Category C Surplus or (Deficit)	Category D Surplus or (Deficit)	Category E Surplus or (Deficit)
Alachua	5,687	1,045	(486)	(3,546)	(5,078)	(6,608)
Bradford	1,695	668	583	498	326	241
Columbia	4,362	135	(39)	(387)	(561)	(737)
Dixie	826	(626)	(643)	(730)	(1,002)	(1,148)
Gilchrist	3,129	2,084	2,043	2,006	1,967	1,930
Hamilton	1,696	758	714	669	627	582
Lafayette	647	166	166	131	61	25
Levy	4,328	1,096	1,050	863	563	125
Madison	4,236	3,157	3,096	3,035	2,972	2,910
Suwannee	3,534	171	45	(7)	(212)	(338)
Taylor	3,626	2,372	2,368	2,211	2,015	1,850
Union	1,284	805	751	698	588	533
Region	35,050	11,831	9,648	5,441	2,266	(635)

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



Source: 2015 Update of North Central Florida Statewide Regional Evacuation Study, September 2015.

3. Riverine and Freshwater Flooding

The Suwannee River System has a broad, expansive floodplain which is regularly inundated in response to spring rains.²⁰ The Suwannee River Water Management District, in conjunction with the Federal Emergency Management Agency, has mapped the 100-year floodplain of the Suwannee River System in order to assist local governments with management of the floodplain. Many local governments within the region have adopted floodplain ordinances for the Suwannee River System to regulate the construction and location of structures within the 100-year floodplain.

Every north central Florida county adjacent to the Suwannee River System has, and requires through their comprehensive plans, low dwelling unit densities within the floodplain. The comprehensive plans of north central Florida local governments limit rural floodplain dwelling unit densities to one unit per five acres and one unit per ten acres. Six small urban areas (Branford, Dowling Park, Fanning Springs, Old Town, Suwannee, and White Springs) are located within the Suwannee River 100-year floodplain. Within these urban areas, the maximum allowable residential density within the floodplain is four units per acre.

Along the major tributaries of the Suwannee (Alapaha, Santa Fe, and Withlacoochee Rivers), dwelling unit densities within the 100-year floodplain are also limited to one unit per five acres and one unit per ten acres. No north central Florida municipalities or urban areas are located within the 100-year floodplains of these rivers. The 100-year floodplains of the region's regionally significant coastal rivers (Aucilla, Econfinia, and Steinhatchee) are similarly protected with maximum allowable dwelling unit densities ranging from one unit per five acres to one unit per ten acres. Only one urban area, the unincorporated town of Steinhatchee, is within the 100-year floodplain of a coastal river (the Steinhatchee River).

In addition to the Suwannee River System, the Federal Emergency Management Agency has prepared maps which identify flood hazard areas for all unincorporated areas of the region as well the region's incorporated municipalities. As of November 2010, 39 of the region's 41 local governments with mapped flood hazard areas within their jurisdiction participated in the National Flood Insurance Program. Participation in the program makes federal flood insurance, the only flood insurance in the nation, available for properties located within the 100-year floodplain. All north central Florida local governments with floodable areas within their jurisdiction, regardless of whether they participate in the National Flood Insurance Program, have comprehensive plans which identify floodable areas and contain policies which address flood management.

In 2014, the City of Live Oak was impacted by freshwater flooding that was reported to be the worst since Hurricane Dora in 1964.

²⁰The Suwannee River System consists of the Suwannee River and its major tributaries the Alapaha, Santa Fe, and the Withlacoochee rivers.



4. Tornadoes

Between 1950 and 2014, 218 tornadoes have touched down in north central Florida resulting in 11 fatalities and 155 injuries.²¹ Tornadoes occur most frequently in the region during the months of May through August, with June as the peak month. However, tornadoes can occur year-round. Currently, there is no accurate way to predict where or when a tornado will “touch down.” Due to their violent nature and the increasing number of mobile homes locating in the region, the probability of property damage and deaths due to tornadoes is increasing.

While mobile homes are of special concern, all north central Florida buildings are vulnerable to tornado damage. Few conventionally-built homes in the region have basements or underground tornado shelters due to a high water table which makes their construction impractical. None of the region’s local governments require construction of tornado shelters or safe rooms for large shopping malls, schools, hospitals, or mobile home parks. The construction of safe rooms may be financially infeasible given the level of risk.

Improvements have been made to the region’s tornado warning system. The National Weather Service installed Doppler weather radar at its Jacksonville and Tallahassee weather stations in 1995 as part of a nationwide modernization program. These locations provide Doppler weather radar information for all eleven north central Florida counties. Doppler radar is a significant improvement over the older weather radar system. Under the old system, meteorologists had to identify tornadoes based on certain visual patterns displayed on the radar screen. Doppler radar detects wind directions and wind velocities at a high degree of resolution within a storm. In addition to displaying radar data on a screen, Doppler radar data is fed to a computer which helps meteorologists understand the storm’s dynamics. Meteorologists at the Jacksonville weather station believe Doppler radar allows the National Weather Service to issue tornado warnings ten to 15 minutes earlier than they could using the prior system. Accuracy is also increased. In June, 1995’s, Hurricane Allison, the Jacksonville weather station identified 16 of the 17 tornadoes which occurred within their area of jurisdiction. According to Al Sandrick, a meteorologist stationed at the Jacksonville National Weather Service station, “We would never have imagined achieving that type of accuracy with the old radar system.”

²¹Tornado History Project, March 16, 2016, <http://www.tornadohistoryproject.com>.



5. Regionally Significant Emergency Preparedness Facilities

The facilities listed in Table 3.4 are recognized as regionally significant facilities.²²

TABLE 3.4

REGIONALLY SIGNIFICANT EMERGENCY PREPAREDNESS FACILITIES

Alachua County Emergency Operations Center
Dixie County Emergency Operations Center
Taylor County Emergency Operations Center
Levy County emergency Operations Center
Public Emergency Shelters
NOAA Radio Stations
Weather Buoys and Similar Off-shore Weather Monitoring Equipment
Doppler Weather Radar Installations Covering the Region
Warning Sirens in Coastal Communities
Gainesville Fire Rescue Hazardous Materials Emergency Response Team

Source: North Central Florida Regional Planning Council, 2010.

6. Hazardous Materials Releases

Under contract with the Florida Division of Emergency Management, the North Central Florida Regional Planning Council serves as staff to the North Central Florida Local Emergency Planning Committee. The North Central Florida Local Emergency Planning Committee was established in 1988 in response to the federal Emergency Planning and Community Right-to-Know Act which requires the preparation of local emergency response plans for hazardous materials releases which, for the State of Florida, have been developed utilizing the ten regional planning council districts.²³ The North Central Florida Local Emergency Planning Committee is composed of representatives of 18 different occupational categories. Membership is also distributed geographically to assure that each of the region's eleven counties has at least one resident serving as a member. Committee members are appointed by the State Emergency Response Committee.

²²Hurricane evacuation routes recognized as regionally significant transportation facilities are listed in Table 5.8. 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.

²³Although referred to as a local plan, it is, in fact, a regional plan which addresses all eleven north central Florida counties.

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The local emergency response plan for north central Florida was adopted by the Committee on June 9, 1989, is updated annually. The North Central Florida Local Emergency Planning Committee emergency response plan identifies locations of possible hazardous materials releases based upon known locations of hazardous materials. The plan also delineates vulnerable zones.²⁴

In addition to the emergency response plan, the North Central Florida Local Emergency Planning Committee is also involved in establishing training programs, conducting emergency response exercises, providing public information campaigns, and other activities aimed at minimizing risks from hazardous materials releases.

Given the rural nature of north central Florida and the large populations located south of the region, it is likely that the biggest hazardous materials emergencies involving unknown chemicals could result from releases from trucks and trains passing through the region. In 2003, the Local Emergency Planning Committee conducted a hazardous materials commodity flow study. The study was used to identify the most common chemicals transported through the region. The information helps guide the selection of hazardous materials training classes as well as planning efforts by the Local Emergency Planning Committee. The commodity flow study looked at transportation on Interstate Highways 10 and 75, as well as U.S. Highways 19 and 301. The most common hazardous materials identified in the study included flammable liquids, toxic and corrosive noncombustible substances, water-miscible, flammable liquids and other toxic or corrosive substances.

When a hazardous materials release occurs, a local fire department or other local government personnel arrive at the scene and determine if local resources can deal with the release. If the incident requires greater than local resources, the local government contacts one of the region's regional response teams.

No regional hazardous materials response team is located within a 60 minute response time of Perry or Greenville. North Central Florida Regional Hazardous Materials Response Team members are located in the City of Alachua, Lake City, Gainesville, Starke and Fanning Springs, and Dixie County. Response times to all eleven counties by at least one of the regional hazardous materials response teams is 60 to 90 minutes. The District 2 Regional Domestic Security Task Force has hazmat response capabilities located in Tallahassee that also provide coverage to Madison and Perry. However, the response times to Perry, Cross City, and Greenville are still in excess of 60 minutes.

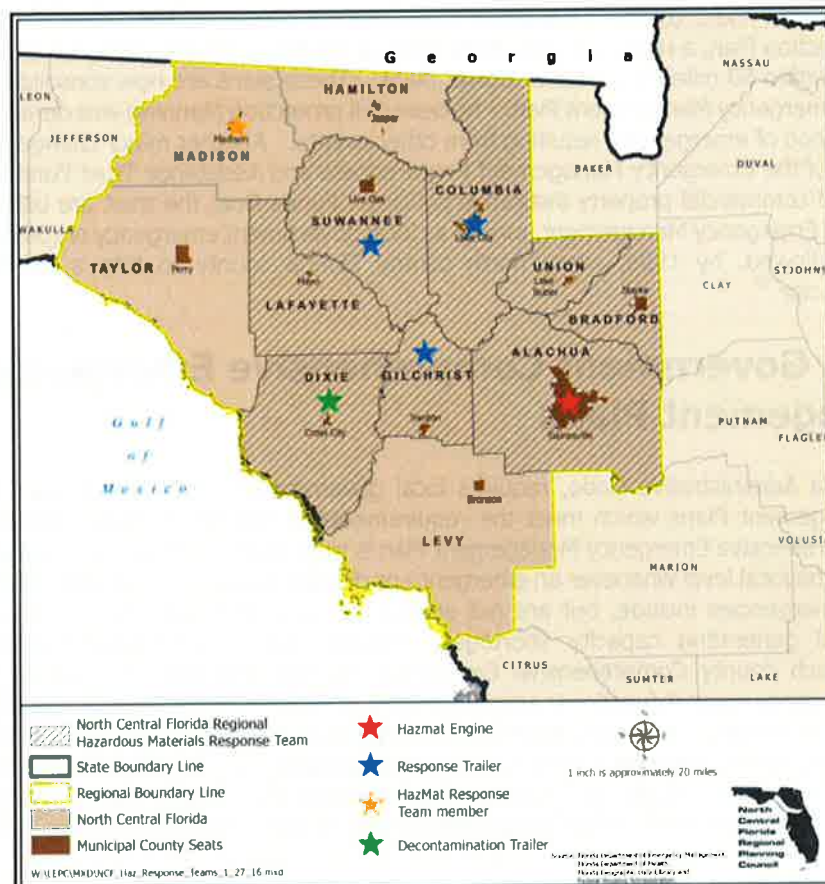
There are areas of north central Florida where the closest hazardous materials response team is in either Valdosta, Georgia or Dothan, Alabama. The Local Emergency Planning Committee has been working to establish a tri-state hazardous materials mutual aid agreement. As of 2015, an agreement has not been adopted by all of the parties. Nevertheless, cross-state hazardous materials response is occurring in the absence of an agreement.

The North Central Florida Regional Hazardous Materials Response Team has expanded the areas which can receive a more timely response. Illustration 3.1 shows the locations of Team members.

²⁴Vulnerable zones are areas where the estimated chemical concentration from an accidental release is at a level where people's health could be adversely impacted during a worst-case release.

Illustration 3.1

**North Central Florida Regional Hazardous Materials Response Team
Locations of Members**



7. State Emergency Management Efforts

In the aftermath of 1992's Hurricane Andrew, the state revitalized its efforts in emergency preparedness planning, especially for hurricanes. After Andrew, the Governor's Disaster Planning and Response Review Committee was established to identify problems with statewide disaster preparedness and recommend improvements. In a report commonly known as the Lewis Report after Committee Chairman Philip D. Lewis, the Committee made 99 recommendations as to how the state could improve its ability to handle emergencies.²⁵ The Committee identified five key recommendations: improve communications at and

²⁵Governor's Disaster Planning and Response Review Committee, Draft Final Report, Executive Office of the Governor, Tallahassee, FL, December 2, 1992.

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among all levels of government; strengthen plans for evacuation, shelter, and post-disaster response and recovery; enhance intergovernmental coordination; improve training; and provide sufficient funding for the development of emergency management plans and activities.

The major recommendations of the Lewis report were incorporated into amendments to the State Emergency Management Act (Chapter 252, Florida Statutes). Formerly, the act required the preparation of three, and sometimes four, county emergency management plans: a Peacetime Emergency Plan, a Nuclear Civil Protection Plan, a Hazardous Materials Emergency Plan, and a Radiological Emergency Plan for counties located within 50 miles of a nuclear power plant. These plans are now consolidated into a single Comprehensive Emergency Management Plan. Nuclear civil protection planning was de-emphasized due to the greater likelihood of emergencies resulting from other events. Another major change to the legislation was the creation of the Emergency Management Preparedness and Assistance Trust Fund from surcharges on residential and commercial property insurance policies. Funds from the trust are used to support the Florida Division of Emergency Management, as well as local government emergency preparedness agencies. The trust fund allowed, by 1994, every north central Florida county to hire a full-time emergency management director.²⁶

8. Local Government Comprehensive Emergency Management Plans

Rule 9G-6, Florida Administrative Code, requires local governments to prepare revised Comprehensive Emergency Management Plans which meet the requirements of rule 9G-7, Florida Administrative Code. The county Comprehensive Emergency Management Plan is to provide a detailed description of the process to be followed at the local level whenever an emergency or disaster occurs as a result of natural or manmade causes. Such emergencies include, but are not limited to: tornadoes, hurricanes, wind storms, floods, freezes, electrical generating capacity shortages, drought, hazardous materials releases, and civil disturbances. Each county Comprehensive Emergency Management Plan is required to address the following 17 emergency support functions: animal services, communications, energy, fire fighting, food and water, hazardous materials, health and medical services, information and planning, law enforcement and security, mass care, military support, public works and engineering, public information, resource support, transportation, search and rescue, and volunteers and donations. County Comprehensive Emergency Management Plans are submitted to the Florida Division of Emergency Management for compliance review.

9. Mutual Aid Agreements

Most north central Florida local governments have not entered into formal mutual aid agreements with their neighbors. If a north central Florida local government requires assistance, it merely calls and their neighboring local government responds. Few such requests have been made, and where they occurred, in the spirit of cooperation, local governments did not charge the requesting local government to cover the costs of the request. However, in an age of increasingly tight local government budgets, the need for more specialized regional response teams, and concerns regarding liability issues, formal mutual aid agreements are becoming increasingly important to assure assistance is available.

²⁶With the exception of Madison County, every north central Florida county has a full-time emergency management director.



Mutual aid agreements provide greater assurances that assistance will be provided, when available, by other local governments. An agreement can decrease the time required by local governments to exchange resources during an emergency without the delay of declaring a formal "state of emergency." This is especially important due to the short timeframes associated with hazardous materials releases.

The State Emergency Management Act authorizes the Division of Emergency Management to develop and enter into mutual aid agreements. The Division has prepared a statewide mutual aid agreement and is requesting all local governments to adopt the agreement.

The statewide agreement allows for reimbursement to assisting local governments for most incurred costs from the Emergency Management Preparedness and Assistance Trust Fund as well as from the requesting local government. The agreement also establishes a supervision and control structure for assisting local government personnel and resources at the scene of the emergency, formalizes procedures for making emergency assistance requests, and resolves other mutual aid issues. As of January-2016, all of the region's local governments had adopted the agreement.

B. Problems, Needs and Opportunities

The Council identifies the following emergency preparedness problems, needs, and opportunities:

1. A need exists for an additional National Oceanic and Atmospheric Administration weather station radio to better serve Suwannee County.
2. A need exists for additional weather monitoring buoys or other meteorological instruments in the Gulf of Mexico between 10 and 50 miles of Steinhatchee.
3. A need exists for the installation of emergency warning sirens in north central Florida coastal communities.
4. An opportunity exists to make flood hazard insurance available within all north central Florida local government jurisdictions.
5. A need exists to reduce the response times of regional hazardous material response teams to hazardous materials emergencies to 60 minutes in Perry and Greenville.
6. Both a need and an opportunity exist for all north central Florida local governments to receive assistance from other local governments during emergencies by becoming signatories to the Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery.

C. Regional Goals and Policies

REGIONAL GOAL 3.1. Improve emergency preparedness for coastal storms in the region.

Regional Indicators

1. As of 2015, one Coastal-Marine Automated Network coastal weather station is located in Keaton Beach, no weather buoys are located in the Gulf of Mexico between 10 and 50 miles of Steinhatchee, three weather buoys are located between 51 and 100 miles of Steinhatchee, two weather buoys are located between 101 and 150 miles of Steinhatchee, and four weather buoys are located in the Gulf of Mexico between 151 to 175 miles of Steinhatchee.
2. As of 2015, National Oceanic and Atmospheric Administration weather radio transmissions covered approximately 97 percent of the region.
3. As of 2015, eight National Oceanic and Atmospheric Administration weather radio stations serve north central Florida.
4. As of 2015, three north central Florida coastal communities (Dekle Beach, Keaton Beach and Steinhatchee) had emergency warning sirens.
5. As of 2015, Dixie County had a Level E In-county clearance time of 13.0 hours.
6. As of 2015, Taylor County had a Level E In-county clearance time of 14.5 hours.
7. As of 2015 Levy County had a Level E In-county clearance time of 13.0 hours.
8. As of 2015, the American Red Cross 4496-Compliant Risk Public Shelter Capacity for the region was 44,958.

Policy 3.1.1. Install weather monitoring buoys or other meteorological instruments at 100, 50, and 10 mile locations in the Gulf of Mexico spaced approximately 50 miles apart along the west Florida coastline from Pinellas to Franklin counties.

Policy 3.1.2. Establish National Oceanic and Atmospheric Administration weather radio station radio coverage for all of north central Florida.

Policy 3.1.3. Establish emergency warning sirens for north central Florida coastal communities.

Policy 3.1.4. Maintain up-to-date hurricane evacuation and inland hurricane shelter plans for north central Florida.

Policy 3.1.5. With the exception of enhancements necessary for the health, safety, and welfare of its residents, avoid the expenditure of state funds that subsidize development in Coastal High Hazard Areas.

Policy 3.1.6. Complete public shelter surveys to determine their compliance status with American Red Cross Publication 4496 guidelines in order to determine the public shelter Risk Capacity for the region.

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Policy 3.1.7. Determine the public shelter Risk Capacity net surplus/deficit for all north central Florida counties.

Policy 3.1.8. Encourage local governments to include in their comprehensive plans to require an analysis of public shelter capacity and evacuation times of new development locating within the Coastal High Hazard Area and within coastal storm evacuation areas to ensure that such development is adequately notified of an approaching storm, evacuated in a timely fashion and does not adversely impact public shelter capacity.

REGIONAL GOAL 3.2. Participation by all north central Florida local governments in the National Flood Insurance Program.

Regional Indicators

1. As of 2015, 56 of the 58 local governments in the region with mapped flood hazard areas within their jurisdictions participated in the National Flood Insurance Program.
2. As of 2015, National Flood Insurance Rate Maps are available for all north central Florida local governments.
3. As of 2015, two north central Florida local governments do not contain mapped flood hazard areas within their jurisdictions.

Policy 3.2.1. Maintain local government eligibility for the Federal Emergency Management Agency Flood Insurance program.

Policy 3.2.2. Assist non-participating north central Florida local governments whose jurisdictions contain floodable area to become eligible and apply for the National Flood Insurance Program.

Policy 3.2.3. Request the Federal Emergency Management Agency to prepare National Flood Insurance Rate Maps for north central Florida municipalities for which such maps have not been prepared.

REGIONAL GOAL 3.3. Reduce response times of regional hazardous materials response teams to 60 minutes for hazardous materials emergencies in Perry and Greenville.

Regional Indicators

1. As of 2015, a hazardous materials commodity flow study was completed to determine the types and amounts of hazardous materials moving via highways in the region.
2. As of 2015, North Central Florida Regional Hazardous Materials Response Team had four active hazardous materials response units located in the Cities of Cross City, Gainesville, Lake City, and Live Oak.

Policy 3.3.1. Establish a regional hazardous materials response team in or near the City of Perry.

Policy 3.3.2. Provide state funding for regional hazardous materials emergency response teams.



Policy 3.3.3. Promote coordination among Valdosta, Georgia, Dothan, Alabama, Tallahassee, Florida and north central Florida local governments to provide hazardous materials emergency response services with response times of 60 minutes or less to Madison County.

REGIONAL GOAL 3.4. Improve the ability of emergency response teams to respond to hazardous materials emergencies.

Regional Indicators

1. As of 2015, two hazardous materials commodity flow studies were completed to determine the types and amounts of hazardous materials moving via highways in the region.
2. As of 2015, no commodity flow studies have been undertaken to determine the types and amounts of hazardous materials moving via railroads in the region.

Policy 3.4.1. Conduct a commodity flow study to determine the types and amounts of hazardous materials moving via railroads located in the region.

Policy 3.4.2. Continue to provide technical assistance to local governments in the preparation of their hazardous materials response plans.

Policy 3.4.3. Continue to serve as staff to the North Central Florida Local Emergency Planning Committee.

Policy 3.4.4. Provide local emergency dispatch operators with a summary of hazards analysis information so as to inform responders as to what types of hazardous materials at the scene of the emergency.

Policy 3.4.5. Provide training to local emergency personnel for dealing with hazardous materials emergencies.

Policy 3.4.6. Keep the general public informed of potential hazardous materials dangers facing their communities by promoting annual hazardous materials spill prevention week programs.

REGIONAL GOAL 3.5. All north central Florida local governments are signatories to the Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery.

Regional Indicator

As of January 2015, 58 north central Florida local governments have adopted the Statewide Mutual Aid Agreement for Catastrophic Disaster Response and Recovery.

Policy 3.5.1. Actively promote north central Florida local governments to adopt the statewide mutual aid agreement for catastrophic disaster response and recovery.



Chapter IV

Natural Resources of Regional Significance

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



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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 8,055 square miles, all of which is classified by the Council as a Natural Resource of Regional Significance.¹

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.² 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.³

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

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

²North 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.

³Listed 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.⁴

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 Wes Skiles Peacock Springs State Park, 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.

⁴The 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. 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
Coastal and Marine Resources	Big Bend Salt Marsh	Big Bend Salt Marsh	72,641.34
Coastal and Marine Resources	Big Bend Seagrass Beds	Big Bend Seagrass Beds	902,381.62
Coastal and Marine Resources	Florida Middle Ground	Florida Middle Ground	132,000.00
Groundwater Resources	Areas of High Recharge Potential to the Floridan Aquifer	Areas of High Recharge Potential to the Floridan Aquifer	1,180,502.52
Groundwater Resources	Floridan Aquifer	Floridan Aquifer	5,154,958.96
Groundwater Resources	Ichetucknee Trace	Ichetucknee Trace	10,767.00
Groundwater Resources	Sinks	Alachua Sink	1.00
Groundwater Resources	Sinks	Aucilla River Sinks	2,000.00
Groundwater Resources	Sinks	Brooks Sink	1.00
Groundwater Resources	Sinks	Clay Sink	1.00
Groundwater Resources	Sinks	Devil's Millhopper	1.00
Groundwater Resources	Sinks	O'lono Sink	1.00
Groundwater Resources	Sinks	Rose Sink	1.00
Groundwater Resources	Sinks	Saylor Sink	1.00
Groundwater Resources	Stream-to-Sink Watershed	Sinking Branch	1,596.00
Groundwater Resources	Stream-to-Sink Watershed	Cannon Creek/Columbia Rose Creek/ Clay Hole Creek	34,303.00
Groundwater Resources	Stream-to-Sink Watershed	Indian Mound Swamp/ South Falling Creek/ Turkey Prairie	30,759.00
Groundwater Resources	Stream-to-Sink Watershed	Little River	35,639.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
Groundwater Resources	Stream-to-Sink Watershed	Norton Creek	9,337.00
Groundwater Resources	Stream-to-Sink Watershed	Alachua Slough/Blues Creek/Burnett Lake/Mill Creek Sink/Hammock Branch/North Alachua/Pareners Branch/Turkey Creek	41,954.00
Groundwater Resources	Stream-to-Sink Watershed	Unnamed basin on Marion-Levy border	56,193.24
Groundwater Resources	Stream-to-Sink Watershed	Priest Prairie Drain	43,132.61
Natural Systems	State Ecological Greenways Network	Regional Ecological Greenways Network	1,861,136
Planning & Resource Management Areas	Private Lands	n/a	5,861.31
Planning & Resource Management Areas	Public Lands	Aucilla River Sinks	1,097.00
Planning & Resource Management Areas	Public Lands	Austin Cary Memorial Forest	2,076.30
Planning & Resource Management Areas	Public Lands	Big Bend Wildlife Management Area	90,662.59
Planning & Resource Management Areas	Public Lands	Big Gum Swamp National Wilderness Area	3,374.00
Planning & Resource Management Areas	Public Lands	Big Shoals State Forest	1,636.04
Planning & Resource Management Areas	Public Lands	Lafayette Blue Springs State-Park	713.74
Planning & Resource Management Areas	Public Lands	Cedar Key National Wildlife Refuge	624.49
Planning & Resource Management Areas	Public Lands	Cedar Key Scrub State Reserve	4,531.04
Planning & Resource Management Areas	Public Lands	Other Local Government Conservation Areas	22,830.32
Planning & Resource Management Areas	Public Lands	Devil's Millhopper Geologic State Park	6724
Planning & Resource Management Areas	Public Lands	Econfina River State Park	4,375.73
Planning & Resource Management Areas	Public Lands	Goethe State Park	52,957.81
Planning & Resource Management Areas	Public Lands	Gum Root Park	371.80
Planning & Resource Management Areas	Public Lands	Ichetucknee Springs State Park	2,531.97

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
Planning & Resource Management Areas	Public Lands	Lake Alto Preserve	672.00
Planning & Resource Management Areas	Public Lands	Lochloosa Wildlife Conservation Area	10,659.68
Planning & Resource Management Areas	Public Lands	Lower Suwannee River National Wildlife Refuge	53,333.83
Planning & Resource Management Areas	Public Lands	Newnans Lake State Forest	1,004
Planning & Resource Management Areas	Public Lands	Okefenokee National Wildlife Refuge	0.00
Planning & Resource Management Areas	Public Lands	O'leno State Park	2,372.41
Planning & Resource Management Areas	Public Lands	Osceola National Forest	114,199.13
Planning & Resource Management Areas	Public Lands	Paynes Prairie Preserve State Park	21,561.72
Planning & Resource Management Areas	Public Lands	Peacock Springs Conservation Area	1,115.19
Planning & Resource Management Areas	Public Lands	River Rise State Preserve	3,827.20
Planning & Resource Management Areas	Public Lands	St. Marks National Wildlife Refuge	1,293.06
Planning & Resource Management Areas	Public Lands	San Felasco Hammock State Preserve	7,358.48
Planning & Resource Management Areas	Public Lands	Santa Fe Swamp Conservation Area	7,368.47
Planning & Resource Management Areas	Public Lands	Stephen Foster State Folk Cultural Center	903.90
Planning & Resource Management Areas	Public Lands	Suwannee River State Park	1,929.71
Planning & Resource Management Areas	Public Lands	Upper Alapaha Conservation Area	2,036.82
Planning & Resource Management Areas	Public Lands	Waccasassa Bay Preserve State Park	4,531.04
Planning & Resource Management Areas	Public Lands	Water Management District Easements	136,643.35

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)
NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
Planning & Resource Management Areas	Public Lands	Other Water Management District Lands	149,474.39
Planning & Resource Management Areas	Public Lands	Other State Lands	50,483.20
Planning & Resource Management Areas	Public Lands	Other Federal Lands	682.44
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Newnans Lake	6,019.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Waccasassa River	200.00
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Withlacoochee River - Citrus/Levy	347.30
Planning & Resource Management Areas	Surface Water Improvement Management Waterbodies	Withlacoochee River - Hamilton/Madison	14,004.24
Surface Water Systems	Fresh Water Wetlands	Bee Haven Bay	7,125.00
Surface Water Systems	Fresh Water Wetlands	California Swamp	21,786.00
Surface Water Systems	Fresh Water Wetlands	Dixie County Coastal Fresh Water Wetlands	155,642.00
Surface Water Systems	Fresh Water Wetlands	Gum Root Swamp	1,448.00
Surface Water Systems	Fresh Water Wetlands	Hixtown Swamp	10,289.00
Surface Water Systems	Fresh Water Wetlands	Lake Alto Swamp	1,405.00
Surface Water Systems	Fresh Water Wetlands	Lochloosa Forest	28,451.00
Surface Water Systems	Fresh Water Wetlands	Mallory Swamp	210,399.00
Surface Water Systems	Fresh Water Wetlands	Osceola National Forest/Pinhook Swamp	184,350.00
Surface Water Systems	Fresh Water Wetlands	Paynes Prairie	21,657.00
Surface Water Systems	Fresh Water Wetlands	San Pedro Bay	305,375.00
Surface Water Systems	Fresh Water Wetlands	Santa Fe Swamp	7,403.00
Surface Water Systems	Fresh Water Wetlands	Spring Warrior Swamp	16,039.00
Surface Water Systems	Fresh Water Wetlands	Taylor County Coastal Fresh Water Wetlands	51,731.00
Surface Water Systems	Fresh Water Wetlands	Tide Swamp	15,236.00
Surface Water Systems	Fresh Water Wetlands	Waccasassa Flats	61,653.00
Surface Water Systems	Fresh Water Wetlands	Waccasassa/Gulf Hammock/Goethe	263,772.27
Surface Water Systems	Lakes	Alligator Lake	968.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
Surface Water Systems	Lakes	Chunky Pond	647.13
Surface Water Systems	Lakes	Lake Butler	436.00
Surface Water Systems	Lakes	Lake Crosby	534.00
Surface Water Systems	Lakes	Lake Geneva	57.76
Surface Water Systems	Lakes	Lake Rowell	357.00
Surface Water Systems	Lakes	Lake Sampson	2,013.00
Surface Water Systems	Lakes	Lake Santa Fe	4,211.00
Surface Water Systems	Lakes	Little Santa Fe Lake	1,096.00
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	Fenholloway River	28,258.85
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	139,931.12
Surface Water Systems	River Corridors	Waccasassa River	15,037.96
Surface Water Systems	River Corridors	Withlacoochee River - Citrus/Levy	14,389.24
Surface Water Systems	River Corridors	Withlacoochee River - Hamilton/Madison	14,004.24
Surface Water Systems	Springs	ALA112971	1.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
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
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	Fanning Springs	1.00
Surface Water Systems	Springs	GIL84971	1.00

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
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
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

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
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	Lev719991 (Levy)	1.00
Surface Water Systems	Springs	Lilly Spring	1.00
Surface Water Systems	Springs	Lime	1.00
Surface Water Systems	Springs	Lime Run Sink	1.00
Surface Water Systems	Springs	Little Fanning Spring	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	Manatee Spring	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	Nuttall 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

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



TABLE 4.1 (Continued)

NATURAL RESOURCES OF REGIONAL SIGNIFICANCE

Map Layer	Classification	Name	Acreage
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
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	Wekiva Springs (Levy)	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, 2016.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



2. Coastal and Marine Resources

The region's coastline bordering the Gulf of Mexico extends approximately 120 miles from the Aucilla River, separating Taylor and Jefferson Counties, south to the Withlacoochee River which forms the boundary between Citrus and Levy counties. The environmental quality of the Gulf coast in Dixie, Levy, 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, Levy, 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.⁵ 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, Levy, 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.⁶

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.

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

⁶Listed 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.⁷ 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.⁸ 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.⁹ 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.

⁷Section 258.395, Florida Statutes.

⁸U.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.

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

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.¹⁰ Environmentally 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.¹¹ 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*, *Dichochoencia stellaris*, and *Dichochoencia 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.

¹⁰The Sensitivity of Coastal Environments and Wildlife to Spilled Oil in the North-Central Florida Region, Research Planning Institute, Inc., Columbia, South Carolina, 1984.

¹¹Proposed 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.



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.

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.¹²

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 overlays 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 2012, 70.1 percent of all north central Florida water withdrawn for human use came from groundwater sources, compared with 29.3 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 99.2 percent of the water withdrawals of the remaining 11-county area.

¹²Water Management Plan, Suwannee River Water Management District, Live Oak, Florida, August 8, 1994, Review Draft, pp. 34-35.



TABLE 4.2
WATER WITHDRAWALS BY SOURCE, 2012
(MILLION GALLONS PER DAY)

Area	Total Withdrawal Amount	Withdrawal Source			
		Groundwater		Surface Water	
	Amount	Amount	Percent of Total	Amount	Percent of Total
Alachua	54.23	53.68	99.0%	0.55	1.0%
Bradford	5.37	5.33	99.3%	0.04	0.7%
Columbia	13.89	13.74	98.9%	0.15	1.1%
Dixie	4.59	4.57	99.6%	0.02	0.4%
Gilchrist	9.29	9.22	99.2%	0.07	0.8%
Hamilton	37.49	37.41	99.8%	0.08	0.2%
Lafayette	6.67	6.62	99.3%	0.05	0.7%
Levy	32.56	31.94	98.1%	0.62	1.9%
Madison	14.06	13.93	99.1%	0.13	0.9%
Suwannee	138.34	30	21.7%	108.34	78.3%
Taylor	42.90	42.87	99.9%	0.03	0.1%
Union	3.13	3.12	99.7%	0.01	0.3%
Region	362.52	252.43	69.6%	110.09	30.4%
Florida	14,988.29	4,172.99	27.8%	10,815.30	72.2%

Source: United States Geological Survey, Open-File Report 2015-1156

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.¹³

Table 4.3 presents the latest data reported in the United States Geological Survey, Water Withdrawals, Use, and Trends in Florida, 2010 regarding groundwater withdrawals by type.

¹³Suwannee River Water Management District, 1996.



TABLE 4.3
WATER USE: WATER WITHDRAWALS BY CATEGORY, 2010
(MILLIONS OF GALLONS PER DAY)

Area	Total	Public	Domestic Self-Supply	Commercial, Industrial and Mining Self-Supply	Agriculture	Recreation and Landscape	Thermo-Electric
Alachua	54.23	26.31	3.52	0.43	20.04	1.43	2.5
Bradford	5.37	1.62	1.67	1.3	0.7	0.08	0
Columbia	13.89	3.7	3.63	0.19	5.99	0.38	0
Dixie	4.59	0.67	0.98	0	2.94	0	0
Gilchrist	9.29	0.23	1.29	0.34	7.43	0	0
Hamilton	37.49	0.85	0.74	25.82	10.08	0	0
Lafayette	6.67	0.17	0.65	0.27	5.58	0	0
Levy	32.56	1.48	1.94	0.15	28.57	0.42	0
Madison	14.06	1.39	1	0.56	10.88	0.23	0
Suwannee	138.34	1.14	2.71	1.78	24.42	0.08	108.21
Taylor	42.9	2.03	0.9	39.51	0.38	0.08	0
Union	3.13	0.38	1.16	0.48	1.11	0	0
Region	362.52	39.97	20.19	70.83	118.12	2.7	110.71
Florida	14988.29	2267.82	213.84	378.35	2551.1	391.93	9185.25

Source: United States Geological Survey, Water Withdrawals, Use, and Trends in Florida, 2010
 NOTE: Total includes Public Supply, Commercial-Industrial-Mining, Agricultural self-supplied, Recreational irrigation, Power generation, and Domestic self-supplied. Sum of water withdrawals by user category do not equal the Total, because Domestic self-supplied user category data was not included in the table.



Table 4.4 reports water withdrawal information from Table 4.3 in percentage terms. As can be seen, 82.6 percent of north central Florida water withdrawals are used for industrial, agriculture, and thermoelectric uses. Only 16.6 percent of north central Florida water withdrawals are used for public and domestic uses. Agricultural use accounts for approximately 32.6 percent of the region's total 2010 water use, which is higher than the statewide percentage of 17.0. 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, 2010
PERCENT OF TOTAL

Area	Total	Public	Domestic Self-Supply	Commercial, Industrial and Mining Self-Supply	Agriculture	Recreation and Landscape	Thermo-Electric
Alachua	100.0%	48.5%	6.5%	0.8%	37.0%	2.6%	4.6%
Bradford	100.0%	30.2%	31.1%	24.2%	13.0%	1.5%	0.0%
Columbia	100.0%	26.6%	26.1%	1.4%	43.1%	2.7%	0.0%
Dixie	100.0%	14.6%	21.4%	0.0%	64.1%	0.0%	0.0%
Gilchrist	100.0%	2.5%	13.9%	3.7%	80.0%	0.0%	0.0%
Hamilton	100.0%	2.3%	2.0%	68.9%	26.9%	0.0%	0.0%
Lafayette	100.0%	2.5%	9.7%	4.0%	83.7%	0.0%	0.0%
Levy	100.0%	4.5%	6.0%	0.5%	87.7%	1.3%	0.0%
Madison	100.0%	9.9%	7.1%	4.0%	77.4%	1.6%	0.0%
Suwannee	100.0%	0.8%	2.0%	1.3%	17.7%	0.1%	78.2%
Taylor	100.0%	4.7%	2.1%	92.1%	0.9%	0.2%	0.0%
Union	100.0%	12.1%	37.1%	15.3%	35.5%	0.0%	0.0%
Region	100.0%	11.0%	5.6%	19.5%	32.6%	0.7%	30.5%
Florida	100.0%	15.1%	1.4%	2.5%	17.0%	2.6%	61.3%

Source: United States Geological Survey, Water Withdrawals, Use, and Trends in Florida, 2010

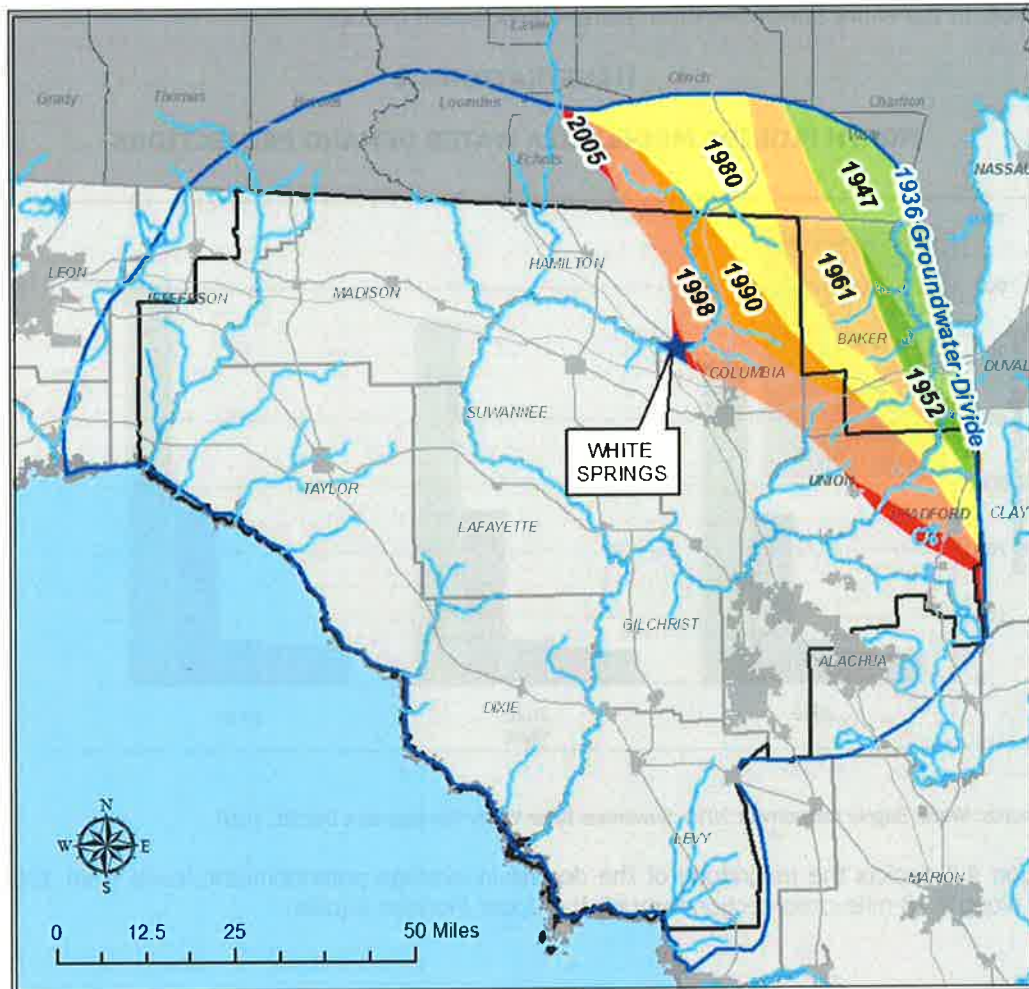
The 2010 Suwannee River Water Management District Water Supply Assessment notes that the water resources of the eastern and northeastern portions of the District are in decline and that this trend is especially evident in the potentiometric surface of the Upper Floridan Aquifer.¹⁴ The Water Supply Assessment 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.

¹⁴Water 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, October 27, 2011 and August 23, 2018

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."¹⁵ 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 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

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

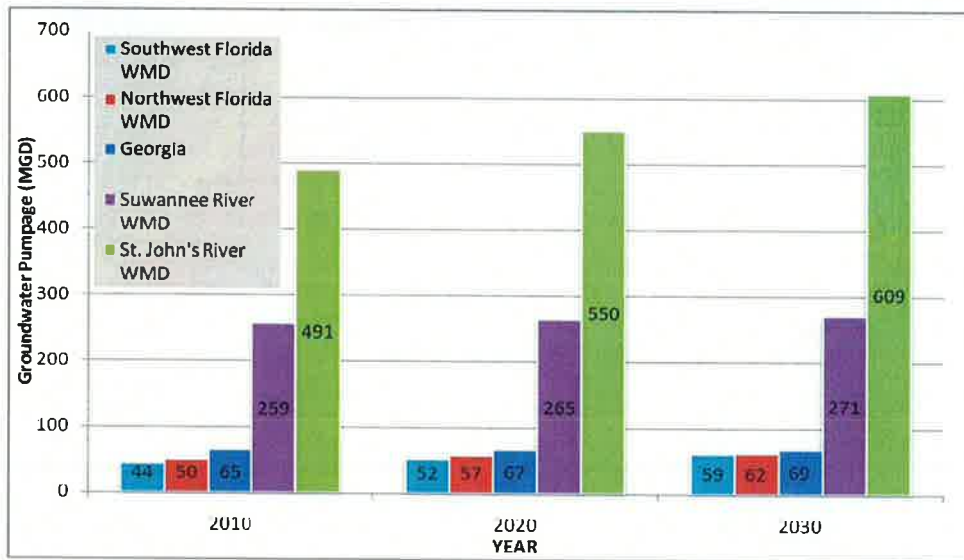
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Management District to identify groundwater impacts. The Assessment notes that, within the geographic area subject to computer modeling, the magnitude of groundwater withdrawals occurring in the St. Johns River Water Management District's northern-most nine counties "... is significantly larger than the withdrawals in the entire Suwannee River Water Management District."¹⁶

ILLUSTRATION 4.2

NORTH FLORIDA MODEL AREA WATER DEMAND PROJECTIONS



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

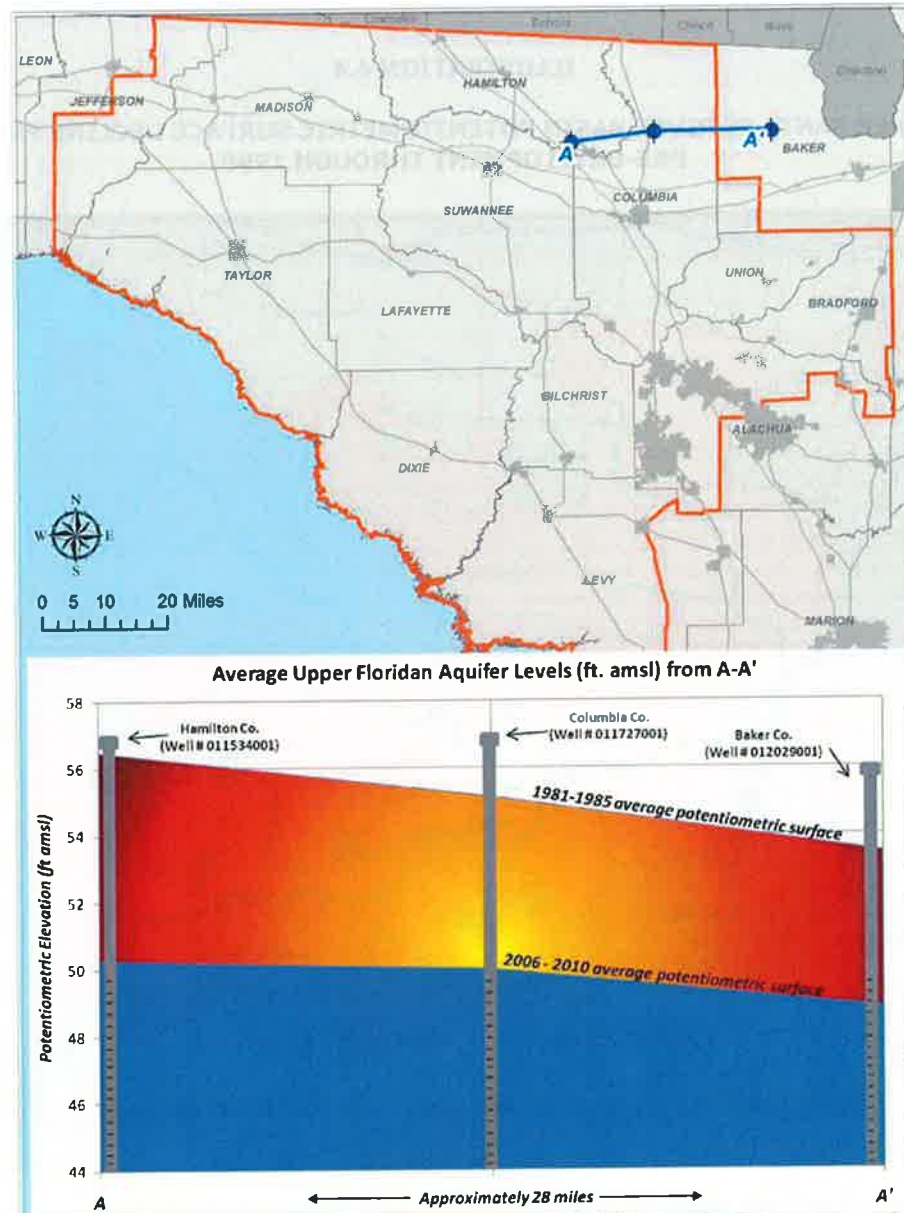
Illustration 4.3 depicts the magnitude of the decline in average potentiometric levels from 1981 to the present along a 28-mile cross-section through the Upper Floridan Aquifer.

¹⁶Water 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, October 27, 2011 and August 23, 2018

ILLUSTRATION 4.3

POTENTIOMETRIC SURFACE DECLINE ACROSS SECTION A-A

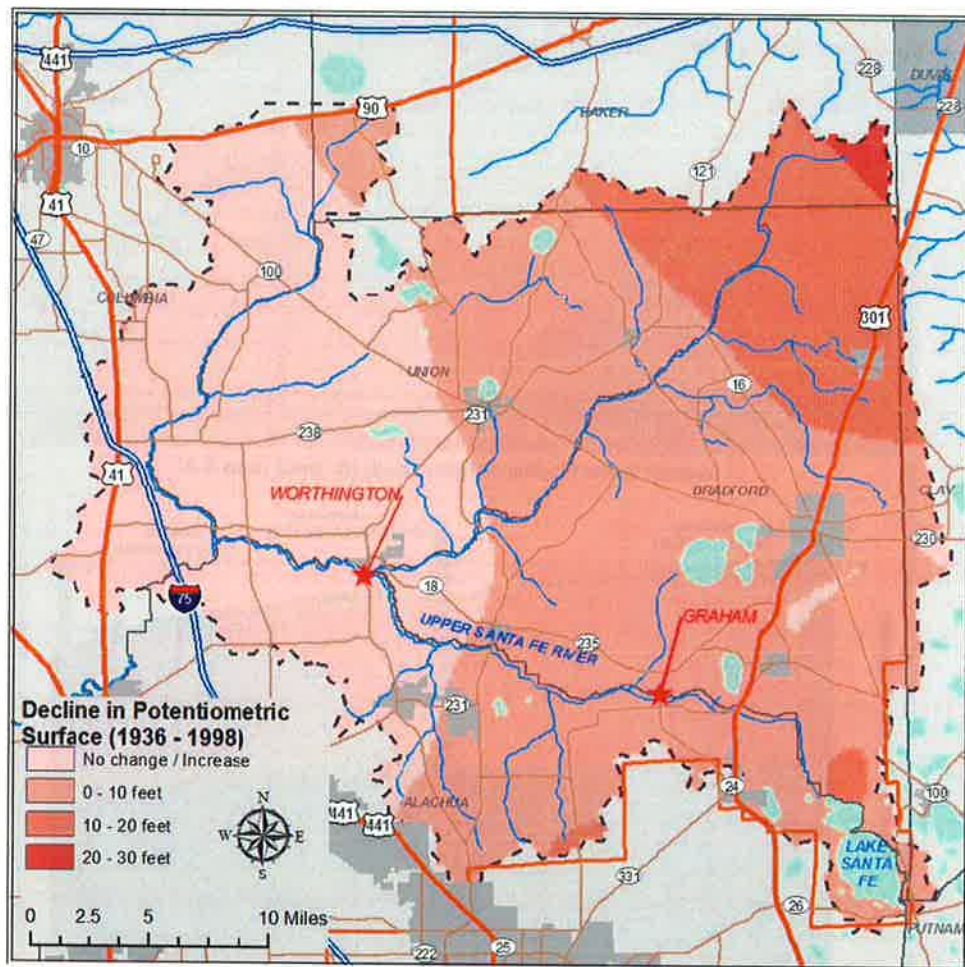


Source: Water Supply Assessment 2010, Suwannee River Water Management District, 2010.

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 1981.¹⁷ 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.

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

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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 2030.¹⁸

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.¹⁹

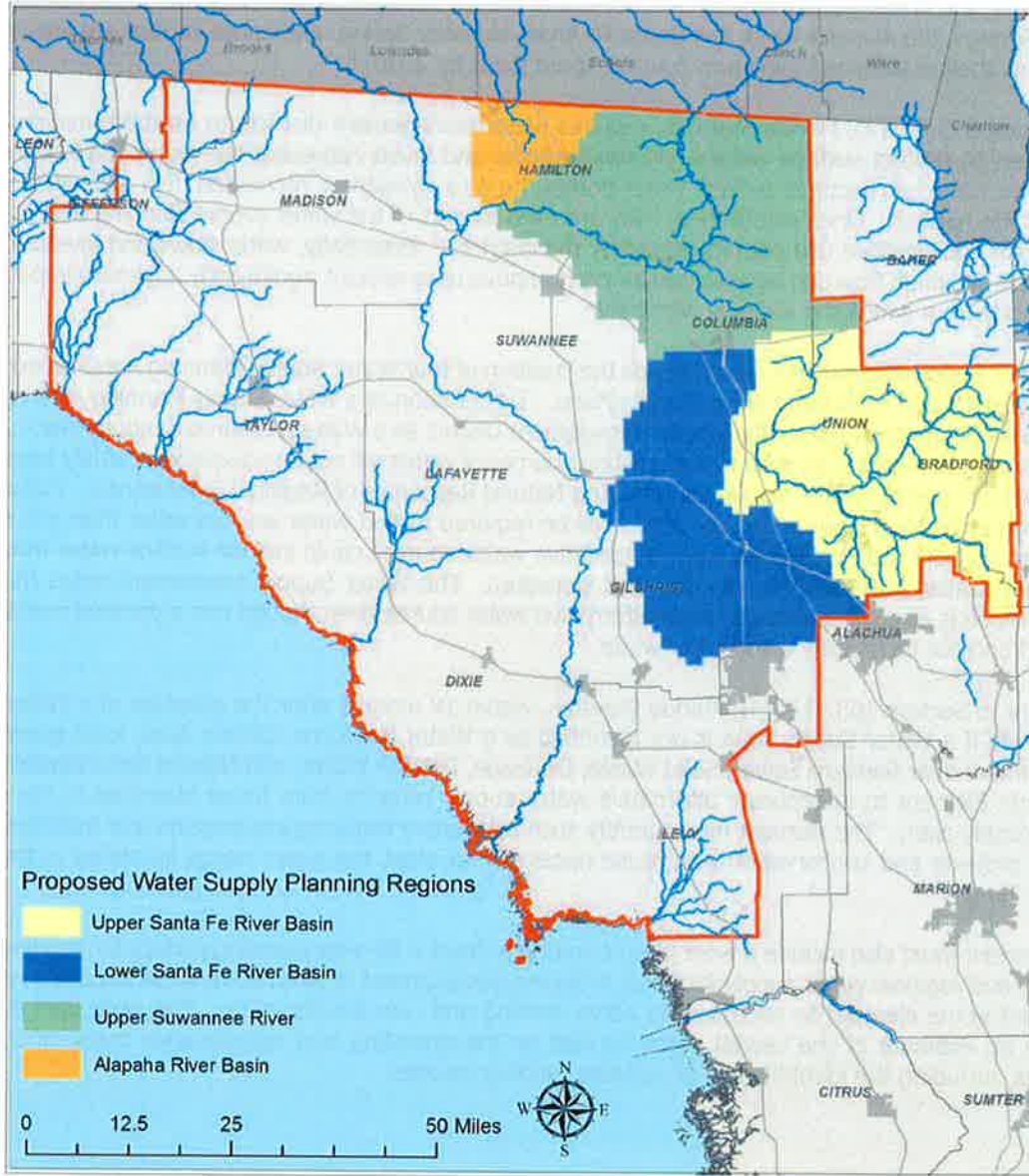
Pursuant to Section 163.3177(4), Florida Statutes, within 18 months after the adoption of a Water Supply Plan, even if a Water Supply Area is not identified as a Water Resource Caution Area, local governments must amend their Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater 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.

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

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

ILLUSTRATION 4.5
WATER SUPPLY PLANNING REGIONS



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

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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.²⁰ 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.²¹

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 regions first-magnitude springs. As can be seen, eight springs have experienced an increase in nitrate nitrogen, while six springs have experienced a decrease in nitrate nitrogen.

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
Alapaha Rise	Hamilton	0.29	8/18/05	0.64	10/7/15	54.69
Blue Hole	Columbia	0.62	9/16/2002	0.76	3/14/16	18.11
Columbia	Columbia	0.5	11/1/05	0.32	1/19/16	(54.94)
Devil's Ear	Gilchrist	2.0	7/14/05	1.65	2006	(21.21)
Falmouth Spring	Suwannee	0.56	8/18/2005	1.48	10/8/2015	62.13
Holton Spring	Hamilton	0.025	10/13/10	0.004	10/7/2015	(525.00)

²⁰Suwannee River Water Management District, 1996.

²¹Draft Water Management Plan, Live Oak, Florida, August 8, 1994, pg. 35.



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
July	Columbia	1.22	8/22/01	1.63	4/20/16	25.16
Lafayette Blue Spring	Lafayette	1.98	3/15/06	2.25	3/15/16	11.84
Madison Blue Spring	Madison	1.7	11/28/05	1.79	12/8/15	5.05
Manatee Spring	Levy	1.88	2/21/06	2.25	2/3/16	16.47
Nuttall Rise	Taylor	0.08	7/6/99	.079	2/2/2016	(1.78)
Santa Fe Rise	Columbia	0.25	5/22/00	0.30	1/21/16	16.69
Santa Fe Spring (Columbia)	Columbia	Current data unavailable				
Siphon Creek Rise	Gilchrist	0.69	8/22/01	Current data unavailable		
Steinhatchee Rise	Taylor	0.03	7/6/99	0.03	9/18/14	0.00
Stevenson Spring	Suwannee	0.74	9/24/97	Current data unavailable		
Treehouse Spring	Alachua	0.52	11/1/05	0.35	1/19/16	(48.83)
Troy Spring	Lafayette	2.83	11/2/05	2.54	11/2/15	(11.52)

a = not available.

Sources: Southwest Florida, St. John's River, and Suwannee River Water Management District, 2016; and Florida Department of Environmental Protection, 2015.

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,

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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 Southwest Florida, St. Johns River, and Suwannee River Water Management Districts, are recognized by the regional plan as Natural Resources of Regional Significance.²²

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, Levy and Madison counties. The regional plan identifies and maps 1,180,502.52 acres, 22.9 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 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 eight stream-to-sink watersheds as Natural Resources of Regional Significance. These are Norton Creek in Madison County,

²²The 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.



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, Alachua Slough/Blues Creek/Burnett Lake/Mill Creek/Hammock Branch/North Alachua/Pareners Branch/Turkey Creek in northern Alachua and southern Columbia Counties, Priest Prairie Drain on the northern Levy-Marion County border, and an unnamed basin on the central Levy-Marion County border.

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.

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.²³ 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 pines 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.

²³North Central Florida Regional Planning Council, Significant Natural Areas in Planning District Three, Gainesville, Florida, 1977, pg. 41.



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 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 Regional Ecological Greenway consists of the two highest priority classes identified in the 2016 update of the Florida Ecological Greenways Network.

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.²⁴

²⁴Listed 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.

a. 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 5,861.31 acres in the region.

b. 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 777,077.91 acres of regionally significant public lands (and conservation easements), representing 15.1 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.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



i. Austin Cary Memorial Forest

Comprising 2,076.30 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 Wildlife Management Area

The Big Bend Coastal Tracts consist of approximately 90,662.59 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.

iv. Local Government Conservation Areas

Local government conservation areas designated as Natural Resources of Regional Significance consist of 23,102.18 acres. The parcels are located in Alachua, Columbia, Gilchrist, Levy 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 2,280.12 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 36 separate holdings consisting of 14,776.55 acres either owned or managed by the County. Gilchrist County manages the 275.87-acre Hart Springs Park. Levy County manages the 3,253.79-acre Devil's Hammock. The Town of Yankeetown manages the 426.56-acre Yankeetown Conservation Area. 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 2,531.97 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 53,333.83 acres of coastal marsh, of which 28,634 acres are located in Dixie County. The remainder is in Levy County. 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 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.

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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 200,155 acres, 114,199.13 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.

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.²⁵ The red-cockaded woodpecker, Florida sandhill crane, American alligator, indigo snake, and Suwannee bass are among the listed species found within the forest.²⁶

²⁵Final 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.

²⁶Listed 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.



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 21,561.72 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.

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.²⁷

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.

²⁷Listed 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.



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.²⁸ 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.²⁹ 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 1,293.06 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 Apalachee 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 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 7,358.48 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 1,929.71 acres of open pine sandhills, rich hardwood hammocks, and dense river swamps. The banks of

²⁸J. Merrill Lynch, Suwannee River Preserve Design Project, The Nature Conservancy, Tallahassee, Florida, 1984, pg. 119.

²⁹Florida Fish and Wildlife Conservation Commission, loc. cit.

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 171,368.29 acres of land in the region. The districts have also acquired conservation easements on an additional 136,643.35 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 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 13 lakes, 14 river corridors, 138 springs, and 17 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.³⁰ 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.³¹

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 21 regional waterbodies 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.³²

New criteria for fish advisories for the general population were adopted in 2016. 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.

³⁰David 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.

³¹Hornsby and Raulston, page 35.

³²Saxitoxin 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.

TABLE 4.6
2016 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES, 2016

Waterbody	Species	Women of Childbearing age, young children NUMBER OF MEALS*	All other individuals NUMBER OF MEALS*
Alapaha River	Spotted bullhead catfish, White catfish	One per week	Two per week
	Spotted sunfish, Redbreast sunfish, Redear sunfish	One per month	Two per week
	Bluegill, Brown bullhead catfish, Channel catfish, Largemouth bass	One per month	One per week
Aucilla River	Redbreast sunfish	One per month	Two per week
	Largemouth bass, Spotted sunfish	One per month	One per month
Econfina River	Redbreast sunfish, Spotted sunfish	One per month	One per week
	Largemouth bass	One per month	One per month
Fenholloway River	Spotted sunfish	Two per week	Two per week
Ichetucknee River	Spotted sunfish	One per week	Two per week
Lake Butler	Redear sunfish	Two per week	Two per week
	Black crappie, Bluegill	One per week	Two per week
	Black crappie, Bluegill, Redear sunfish	Two per week	Two per week
Lake Lochloosa	Largemouth bass less than 15 inches	One per week	Two per week
	Warmouth	One per month	Two per week
	Largemouth bass 24 inches or more	One per month	One per week
	Bluegill	One per month	One per week
Lake Octahatchee	Largemouth bass	DO NOT EAT	DO NOT EAT
Lake Sampson	Redear sunfish	Two per week	Two per week
	Bluegill, Warmouth	One per week	Two per week
	Chain pickerel, Largemouth bass	One per month	One per week
	Black crappie	One per month	One per month
Lake Santa Fe	Redear sunfish, Bluegill	Two per week	Two per week
	Largemouth bass	One per month	One per month



TABLE 4.6 (Continued)

2016 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES, 2016

Waterbody	Species	Women Childbearing young NUMBER OF MEALS*	of age, children NUMBER OF MEALS*	All other individuals NUMBER OF MEALS*
Newnans Lake	Black crappie, Bluegill, Brown bullhead catfish	One per week		Two per week
	Largemouth bass	One per month		One per month
Orange Lake	Bluegill, Brown bullhead catfish, Redear sunfish, Black crappie	Two per week		Two per week
	Largemouth bass less than 15 inches	One per week		Two per week
	Warmouth	One per month		Two per week
Otter Creek	Largemouth bass 24 inches or more	One per month		One per week
	Redbreast sunfish	One per week		Two per week
	White catfish	One per month		One per week
	Spotted sunfish	One per month		Two per week
	Bluegill, Channel catfish, Redear sunfish, Redbreast sunfish	One per week		Two per week
Santa Fe River (Lower-downstream of rise)	Spotted sunfish, Spotted bullhead catfish	One per month		Two per week
	Brown bullhead catfish	One per month		One per week
	Largemouth bass	One per month		One per week
	Bluegill	One per week		Two per week
Santa Fe River (Upper-upstream of sink)	Spotted sunfish	One per month		Two per week
	Black crappie, Channel catfish, Redbreast sunfish, Redear sunfish, Warmouth	One per month		One per week
	Largemouth bass	One per month		One per month



TABLE 4.6 (Continued)

2016 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES, 2016

Waterbody	Species	Women Childbearing young NUMBER OF MEALS*	of age, children NUMBER OF MEALS*	All other individuals NUMBER OF MEALS*
St. Johns River North of SR 415 including Lakes George and Monroe (Lower River)	Bluegill, Redear sunfish, Spotted sunfish, Brown bullhead catfish, Striped bass, Channel catfish, White catfish	Two per week		Two per week
	Black crappie, Warmouth Redbreast sunfish	One per week		Two per week
	Spotted sunfish, Largemouth bass	One per month		Two per week
	Spotted sunfish, Redbreast sunfish, Redear sunfish	One per month		One per week
Steinhatchee River	Largemouth bass	DO NOT EAT		One per month
Suwannee River System (Including Alapaha, Suwannee, and Withlacoochee Rivers) (see separate advisory for Santa Fe River)	Spotted bullhead catfish, White catfish	One per week		Two per week
	Redbreast sunfish, Redear sunfish, Spotted sunfish	One per month		Two per week
	Bluegill, Brown bullhead catfish, Channel catfish, Largemouth bass	One per month		One per week
	Black crappie	One per month		One per month
Waccasassa River and tributaries (including Otter Creek and Wekiva	Redbreast sunfish	One per week		Two per week
	Spotted sunfish	One per month		Two per week
	White catfish	One per month		One per week
	Largemouth bass	One per month		One per month
Wekiva River (Waccasassa River tributary)	Redbreast sunfish	One per week		Two per week
	White catfish	One per month		One per week
	Spotted sunfish	One per month		Two per week



TABLE 4.6 (Continued)

2016 FLORIDA DEPARTMENT OF HEALTH FISH CONSUMPTION ADVISORIES

Waterbody	Species	Women Childbearing young NUMBER OF MEALS*	of age, children NUMBER OF MEALS*	All other individuals NUMBER OF MEALS*
Withlacoochee River North (Suwannee tributary)	Spotted bullhead catfish, White catfish	One per week		Two per week
	Redbreast sunfish, Redear sunfish, Spotted sunfish	One per month		Two per week
	Bluegill, Brown bullhead catfish, Channel catfish, Largemouth bass	One per month		One per week
Withlacoochee River South	Bluegill, Redear sunfish	Two per week		Two per week
	Spotted sunfish, Redbreast sunfish	One per month		Two per week
	Largemouth bass	One per month		One per week

Source: Your Guide to Eating Fish Caught in Florida, Florida Department of Health, 2016.



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 2014.

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.



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	Comments
3473A	Fenholloway at Mouth	Stream Estuary	Dissolved Oxygen	High	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007
3473B	Fenholloway Below Pulp Mill	Stream	Dissolved Oxygen, Un-ionized Ammonia, Conductivity	High	Total Managed Daily Loads Finalized by U.S. Environmental protection Agency, May 2007
3473C	Fenholloway Above Pulp Mill	Stream	Dissolved Oxygen	High	The impairment may be linked to nutrients. This will remain on the planning list until the causative pollutant can be identified.
3518	Spring Creek	Stream	Fecal Coliform	Low	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007.
3603	Bevins/Boggy Creek	Stream	Fecal Coliform	Low	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.
3422D	Suwannee Estuary; Gulf of Mexico	Estuary; Coastal	Bacteria (in Shellfish); Fecal Coliform (3)	Low; High	Listed due to downgrade in shellfish classification. The waterbody includes at least one sampling location that has a median fecal coliform most probable number value that exceeds 14 counts per 100 milliliter for the verified period. This parameter is being added to the 303(d) list.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



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	Comments
3473A	Fenholloway at Mouth	Estuary	Dissolved Oxygen	High	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007
3473B	Fenholloway Below Pulp Mill	Stream	Dissolved Oxygen, Un-ionized Ammonia, Conductivity	High	Total Managed Daily Loads Finalized by U.S. Environmental protection Agency, May 2007
3473C	Fenholloway Above Pulp Mill	Stream	Dissolved Oxygen	High	The impairment may be linked to nutrients. This will remain on the planning list until the causative pollutant can be identified.
3518	Spring Creek	Stream	Fecal Coliform	Low	Total Managed Daily Loads Finalized by U.S. Environmental Protection Agency, May 2007.
3603	Bevins/Boggy Creek	Stream	Fecal Coliform	<u>Low</u>	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.
3422D	Suwannee Estuary; Gulf of Mexico	Estuary; Coastal	Bacteria (in Shellfish); Fecal Coliform (3)	Low; High	Listed due to downgrade in shellfish classification. The waterbody includes at least one sampling location that has a median fecal coliform most probable number value that exceeds 14 counts per 100 milliliter for the verified period. This parameter is being added to the 303(d) list.



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	Comments
3733	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
3556	Weaver Warrior Creek	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3705	Butler (Lilly) Creek	Estuary	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3706	Amason Creek	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
3724	Direct Runoff to Gulf	Estuary	Fecal Coliform (3); Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired for this waterbody. The waterbody includes at least one sampling location that has a median fecal coliform most probable number value that exceeds 14 counts per 100 milliliters for the verified period.
3725	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
8032A	Dekle Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 301 days in 2007.

Adopted May 23, 1996, Amended August 28, 1997, February 27, 2003, October 27, 2011 and August 23, 2018



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	Comments
8032C	Cedar Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 301 days in 2007.
8032E	Hagens Cove Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 266 days in 2007.
8035A	Suwannee Gulf 7 Shired Island Park	Beach	Bacteria - Beach Advisory	High	Has advisories for 356 days in 2007.
8035B	Gulf of Mexico (Dixie County-Shellfish Portion)	Coastal	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
3504A	Olustee Creek	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	This is a blackwater stream.
3519S	Mission Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.
3519T	Devil's Eye Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.
3519X	Blue Hole Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.



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	Comments
3520	Cannon Creek	Stream	Fecal Coliforms	Medium	
3531	Rose Creek	Stream	Dissolved Oxygen (biochemical oxygen demand)	Medium	Biochemical oxygen demand was identified as the causative pollutant because it exceeded the biochemical oxygen demand threshold for identification of a causative pollutant (2.0 milligrams/Liter).
3531A	Rose Creek Sink	Stream	Dissolved Oxygen; Nutrients (Chlorophyll-a)	Medium	The dissolved oxygen impairment was linked to nutrients (Chlorophyll); Annual average for 2006 exceeded the threshold of 20 micrograms/Liter for streams.
3593A	Lake Crosby	Lake	Nutrients (trophic state index)	Medium	This parameter is impaired for this waterbody because the annual average trophic state index values exceeded the impaired waters rule threshold for clear lakes of 40 trophic state index units in 2011.
3598C	Alligator Creek	Stream	Fecal Coliform	Low	
3605A	Santa Fe River	Stream	Nutrients (Algal Mats and Historical Chlorophyll); Dissolved Oxygen	Medium; High	Total Nitrogen is limiting nutrient.
3605F	Altho Drainage	Stream	Dissolved Oxygen	High	Total nitrogen median exceeded the threshold for streams in the verified period but was based on only 5 samples (10 are required). Linked to algal mats.
3626	Pariners Branch	Stream	Fecal Coliforms	Medium	

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TABLE 4.7 (Continued)
VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS
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Waterbody Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3644	Mill Creek Sink	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	Dissolved oxygen met verification threshold of impaired waters rule, and total phosphorus was identified as a causative pollutant.
3654	Monteocha Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for a sample size less than 20.
3671A	Turkey Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size and is being added to the 303(d) list.
3678A	Hague Branch	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size and is being added to the 303(d) list.
3682	Blue Creek	Stream	Fecal Coliform	Low	
3325	Alligator Creek	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, total phosphorus was identified as the causative pollutant.
3330	Little Alapaha River	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, total phosphorus was identified as the causative pollutant.
3314	Little Aucilla River	Stream	Dissolved Oxygen	Medium	This is a blackwater stream. Met verification threshold of impaired waters rule, total nitrogen and biochemical oxygen demand were identified as causative pollutants.
1329C	Withlacoochee River	Stream	Mercury (in fish tissue)	High	Verified for impairment based on Florida Department of Health fish consumption advisory data.



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	Comments
1329R	Wilson Head Spring	Spring	Nutrients (Algal Mats)	Medium	This spring has been verified as impaired for nutrients based on "other information" that indicated an imbalance in flora or fauna. Nitrate+nitrite levels range from 0.56 - 0.8 milligrams/Liter during the verified period and is the likely cause of the impairment.
1337	Withlacochee River	Stream	Mercury (in fish tissue)	High	Verified for impairment based on Florida Department of Health fish consumption advisory data.
1337A	Bypass Channel	Stream	Mercury (in fish tissue)	High	Verified for impairment based on Florida Department of Health fish consumption advisory data.
3480	Bethel Creek	Stream	Fecal Coliform	Low	
3483	Peacock Slough	Stream	Nutrients (Algal Mats)	Medium	Placed on the verified list based on algal mats and elevated nitrate concentrations in the planning period.
3496A	Low Lake	Lake	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and total phosphorus and biochemical oxygen demand were identified as a causative pollutants.
3528Z	Lafayette Blue Springs	Stream	Nutrients (Algal Mats)	Medium	Placed on the verified list based on algal mats and elevated nitrate concentrations in the verified period.
2688	Hatchet Creek	Stream	Fecal Coliform; Nutrients (Historic Chlorophyll-a)	Low; Medium	The median value of 127 total nitrogen/total phosphorus ratio is about ten, suggesting phosphorus and nitrogen co-limiting.
2695	Little Hatchet Creek	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	Flows from Gum Root Swamp. Elevated nutrients may contribute.

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TABLE 4.7 (Continued)

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
2696	Possum Creek	Stream	Fecal Coliform	Low	
2705A	Prairie Creek	Stream	Dissolved Oxygen	Medium	Met the verification threshold and total nitrogen was identified as the causative pollutant.
2705B	Newnans Lake	Lake	Dissolved Oxygen	Medium	Met the verification threshold and total nitrogen and total phosphorus were identified as the causative pollutants.
2709	Sunland Drain	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size.
2710	Unnamed Drain	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for a sample size less than 20.
2713	Little Orange Creek	Stream	Fecal Coliform	Low	
2717	Kanapaha Lake	Lake	Dissolved Oxygen (Nutrients and biochemical oxygen demand)	Medium	This parameter is impaired for this waterbody based on the number of exceedances for the sample size.
2718	Bivens Arm Outlet	Stream	Dissolved Oxygen; Nutrients (Chlorophyll-a)	Medium	Met the verification threshold and total nitrogen and total phosphorus were identified as the causative pollutants; This parameter is impaired for this waterbody because the annual average chlorophyll-a values exceeded the impaired waters rule threshold for streams of 20 micrograms/Liter.
2718B	Bivens Arm	Lake	Nutrients (trophic state index); Turbidity	Medium	Co-limited by nitrogen and phosphorus based on a median total nitrogen/total phosphorus ratio of 12.31 (65 values) in the verified period.



TABLE 4.7 (Continued)

VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS
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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
2719	Lake Alice Outlet	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for a sample size less than 20.
2720	Alachua Sink Outlet	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	Met the verification threshold and total nitrogen was identified as the causative pollutant.
2720A	Alachua Sink	Lake	Fecal Coliform	Low	
2733	Camps Canal Reach	Stream	Dissolved Oxygen	Medium	Met the verification threshold and total nitrogen was identified as the causative pollutant.
2738A	Lochloosa Lake	Lake	Nutrients (trophic state index)	Medium	Co-limited by nitrogen and phosphorus based on a median total nitrogen/total phosphorus ratio of 29.57 (135 values) in the verified period.
2749A	Orange Lake	Lake	Dissolved Oxygen	Medium	Met the verification threshold and total nitrogen and total phosphorus were identified as the causative pollutants.
2749B	Orange Lake Drain	Stream	Dissolved Oxygen (Nutrients)	Medium	This parameter is impaired for this waterbody based on the number of exceedances for the sample size.
2751	Lochloosa Slough	Stream	Dissolved Oxygen (Nutrients)	Medium	This parameter is impaired for this waterbody based on the number of exceedances for the sample size.
2754	Cross Creek	Stream	Dissolved Oxygen; Nutrients (Chlorophyll-a)	Medium	Met the verification threshold, but unable to determine the causative pollutants; The median value of 45 total nitrogen/total phosphorus ratio is about 14, suggesting phosphorus and nitrogen are co-limiting nutrients.
3573B	Steinhatchee River	Stream	Fecal Coliform	Low	
2211	Middle Prong St Marys River	Blackwater	Mercury (in fish tissue)	High	Verified for impairment based on Florida Department of Health fish consumption advisory data.

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TABLE 4.7 (Continued)
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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
1326	Sheephead Creek	Estuary	Fecal Coliform (3)	Low	
1328	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
1332	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
1333	Spring Run	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
1335	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
3699	Waccasassa River	Stream	Fecal Coliform	Low	

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TABLE 4.7 (Continued)

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3699B	Waccasassa River	Estuary	Fecal Coliform (3)	High	The waterbody includes at least one sampling location that has a median fecal coliform most probable number value that exceeds 14 counts per 100 milliliters for the verified period.
3729A	Black Point Swamp	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification); Nutrients (Chlorophyll-a)	High; Medium	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services; This parameter is impaired for this waterbody because the annual average chlorophyll-a values exceeded the impaired waters rule threshold for estuaries of 11 micrograms/Liter in 2005.
3739	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
3740	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.
3743	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
8037A	Cedar Key Park	Beach	Bacteria (Beach Advisories)	High	Beach advisories posted for a total 136 days in 2007.
8037B	Gulf of Mexico (Levy County)	Coastal	Fecal Coliform (Shellfish Environmental Assessment Section Classification); Nutrients (Chlorophyll-a)	High; Medium	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services; Based on the median total nitrogen/total phosphorus ratio of 14.58, total nitrogen and total phosphorus are co-limiting nutrients.
8037C	Cedar Key	Coastal	Nutrients (Chlorophyll-a)	Medium	Based on the median total nitrogen/total phosphorus ratio of 13.63, total nitrogen and total phosphorus are co-limiting nutrients.
8038	Waccasassa River Gulf 2	Coastal	Bacteria (in Shellfish)	Low	Listed due to downgrade in shellfish harvesting classification.
3315Z	Blue Spring (Madison County)	Spring	Nutrients (Algal Mats)	Medium	This parameter is impaired for this waterbody based on "other information" indicating an imbalance in flora.
3321	Lake Octahatchee Outlet	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3366	Lake Francis Outlet	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3366A	Lake Francis	Lake	Nutrients (trophic state index)	Medium	This parameter is impaired for this waterbody because the annual average trophic state index values exceeded the impaired waters rule threshold for clear lakes of 40 trophic state index units.

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TABLE 4.7 (Continued)

VERIFIED LIST OF IMPAIRED NORTH CENTRAL FLORIDA WATERS
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Waterbody Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3364	Hunter Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size.
3368	Little Creek	Stream	Dissolved Oxygen	Medium	This is a blackwater stream. Met verification threshold of impaired waters rule, and total phosphorus was identified as a causative pollutant.
3368	Little Creek	Stream	Fecal Coliform	Low	This is a blackwater stream.
3375	Swift Creek	Stream	Fecal Coliform	Low	
3388	Deep Creek	Stream	Fecal Coliform	Low	This is a blackwater stream.
3389	Sugar Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size and is being added to the 303(d) list.
3401	Camp Branch	Stream	Fecal Coliform	Low	Total maximum daily load established by U.S. Environmental Protection Agency 3/31/2004.
3449	Rocky Creek near Wellborn	Stream	Dissolved Oxygen	Medium	This is a blackwater stream. Met verification threshold of impaired waters rule, and total phosphorus and biochemical oxygen demand were identified as causative pollutants.
3477	Falling Creek	Stream	Fecal Coliform	Medium	This parameter is impaired for this waterbody based on the number of exceedances for a sample size less than 20.
3733	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services.

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TABLE 4.7 (Continued)
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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3556	Weaver Warrior Creek	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3705	Butler (Lilly) Creek	Estuary	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and biochemical oxygen demand was identified as a causative pollutant.
3706	Amason Creek	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
3724	Direct Runoff to Gulf	Estuary	Fecal Coliform (3); Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired for this waterbody. The waterbody includes at least one sampling location that has a median fecal coliform most probable number value that exceeds 14 counts per 100 milliliters for the verified period.
3725	Direct Runoff to Gulf	Estuary	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
8032A	Dekle Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 301 days in 2007.
8032C	Cedar Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 301 days in 2007.

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
8032E	Hagens Cove Beach	Beach	Bacteria - Beach Advisory	High	Has advisories for 266 days in 2007.
8035A	Suwannee Gulf 7 Shired Island Park	Beach	Bacteria - Beach Advisory	High	Has advisories for 356 days in 2007.
8035B	Gulf of Mexico (Dixie County-Shellfish Portion)	Coastal	Fecal Coliform (Shellfish Environmental Assessment Section Classification)	High	This parameter is impaired because the shellfish harvesting classification is not fully approved by the Shellfish Environmental Assessment Section of the Florida Department of Agriculture and Consumer Services. It is being added to the 303(d) list.
3504A	Olustee Creek	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	This is a blackwater stream.
3519S	Mission Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.
3519T	Devil's Eye Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.
3519X	Blue Hole Spring	Stream	Nutrients (Algal Mats)	Medium	This is a spring. Impaired due to severe epiphyte algal mat problem, as evidenced by "very poor" Algal Mat Potential rating.
3520	Cannon Creek	Stream	Fecal Coliforms	Medium	

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3531	Rose Creek	Stream	Dissolved Oxygen (biochemical oxygen demand)	Medium	Biochemical oxygen demand was identified as the causative pollutant because it exceeded the biochemical oxygen demand threshold for identification of a causative pollutant (2.0 milligrams/Liter).
3531A	Rose Creek Sink	Stream	Dissolved Oxygen; Nutrients (Chlorophyll-a)	Medium	The dissolved oxygen impairment was linked to nutrients (Chlorophyll); Annual average for 2006 exceeded the threshold of 20 micrograms/Liter for streams.
3593A	Lake Crosby	Lake	Nutrients (trophic state index)	Medium	This parameter is impaired for this waterbody because the annual average trophic state index values exceeded the impaired waters rule threshold for clear lakes of 40 trophic state index units in 2011.
3598C	Alligator Creek	Stream	Fecal Coliform	Low	
3605A	Santa Fe River	Stream	Nutrients (Algal Mats and Historical Chlorophyll); Dissolved Oxygen	Medium; High	Total Nitrogen is limiting nutrient.
3605F	Altho Drainage	Stream	Dissolved Oxygen	High	Total nitrogen median exceeded the threshold for streams in the verified period but was based on only 5 samples (10 are required). Linked to algal mats.
3626	Pareners Branch	Stream	Fecal Coliforms	Medium	
3644	Mill Creek Sink	Stream	Dissolved Oxygen; Fecal Coliform	Medium; Low	Dissolved oxygen met verification threshold of impaired waters rule, and total phosphorus was identified as a causative pollutant.

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TABLE 4.7 (Continued)

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Water-body Identification Number	Waterbody Segment	Waterbody Type	Parameter of Concern	Priority	Comments
3654	Monteocha Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for a sample size less than 20.
3671A	Turkey Creek	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size and is being added to the 303(d) list.
3678A	Hague Branch	Stream	Fecal Coliform	Low	This parameter is impaired for this waterbody based on the number of exceedances for the sample size and is being added to the 303(d) list.
3682	Blue Creek	Stream	Fecal Coliform	Low	
3325	Alligator Creek	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, total phosphorus was identified as the causative pollutant.
3330	Little Alapaha River	Stream	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, total phosphorus was identified as the causative pollutant.
3314	Little Aucilla River	Stream	Dissolved Oxygen	Medium	This is a blackwater stream. Met verification threshold of impaired waters rule, total nitrogen and biochemical oxygen demand were identified as causative pollutants.
3480	Bethel Creek	Stream	Fecal Coliform	Low	
3483	Peacock Slough	Stream	Nutrients (Algal Mats)	Medium	Placed on the verified list based on algal mats and elevated nitrate concentrations in the planning period.
3496A	Low Lake	Lake	Dissolved Oxygen	Medium	Met verification threshold of impaired waters rule, and total phosphorus and biochemical oxygen demand were identified as a causative pollutants.

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