

# Looking at the Big Picture



the entire Pensacola Bay system discharges to the Gulf of Mexico primarily through this narrow pass...

# THE Pensacola Bay WATERSHED

# GARCON POINT

## *Serengeti of Carnivorous Plants*

Garcon Point peninsula, between Escambia and Blackwater bays, is a nearly lost world of insectivorous plants. Here remnant communities of coastal bogs now over 90 percent lost to development, host so many insects and insect-eating plants that one botanist named it the "Serengeti of carnivorous plants." Here too is one of the few intact pitcher plant prairies in Florida, including white top, sweet (red-flowered), parrot and yellow trumpet pitcher plants, common and pink sundews, dew threads, butterworts and bladderworts.

At least 13 endangered or threatened species grow on this property, including the imperiled panhandle lily and four threatened orchid varieties. The rare Henslow and Le Conte's sparrows have been sighted, as well as blue birds, pine warblers, osprey, harrier and red-tailed hawks.

A 2.7 mile trail was established through the District-owned and -managed 3,235 acre preserve by the Florida Trail Association. It is located on Route 191, nine miles south of Milton, and minutes from Pensacola (I-10 to State Road 281 to Route 191). If you go, wear insect protection, leave only footprints and bring your camera.



GARCON POINT HIKING TRAIL



parrot pitcher plant

bladderwort



white-topped pitcher plant



Courtesy Northwest Florida Aquatic and Baiter Preserves



sweet pitcher plant

Courtesy Northwest Florida Aquatic and Baiter Preserves



Courtesy Northwest Florida Aquatic and Baiter Preserves

# ABOUT THE PENSACOLA WATERSHED



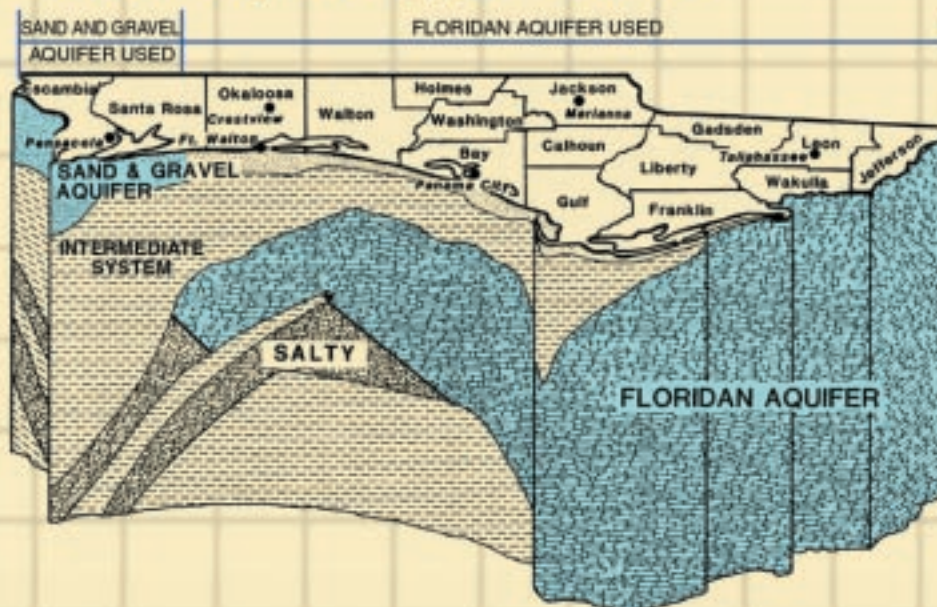
The Pensacola Bay **watershed** drains almost 7,000 square miles in Florida and southern Alabama through a narrow pass to the Gulf of Mexico. A **watershed** is an area that drains to a common point. The Pensacola Bay watershed comprises four river systems, the Escambia, Blackwater, East Bay and Yellow/Shoal rivers, and five **estuaries**, the Pensacola, Escambia, Blackwater and East bays and Santa Rosa Sound. An **estuary** is an area where fresh and salt water mix.

Only about a third of the watershed is in Florida, where it covers the majority of Escambia, Santa Rosa, Okaloosa and northwest Walton counties. The area receives an abundant 60 inches, or five feet, average rainfall a year. Some flows directly into rivers and bays, some evaporates. About a third soaks into sandy soils and contributes to **baseflow**. **Baseflow** is composed of ground water that seeps through river banks and beds to become part of the river flow.

## *The Sand and Gravel Aquifer*

The Sand and Gravel **Aquifer** is a vast layer of sandy soils underlying the western panhandle. An **aquifer** is a formation of sediment or rock capable of holding water. The limestone Floridan Aquifer is deeply buried and brackish in this region. This is why the Sand and Gravel Aquifer, ranging from 150 feet deep at the coast to 450 feet inland, is the primary source of ground water for much of the area.

About 100 million gallons a day are pumped from the Sand and Gravel Aquifer in Escambia and Santa Rosa counties, mostly for water supply and industrial uses.



# The Story of Bayou Chico

Bayou Chico was once so saturated with chemicals that wooden boats sailed into its turnaround basin to clean their hulls. In a few days all the barnacles and wood-eating worms were dead. Polluted by raw sewage from domestic and industrial wastewater treatment plants and several shipyards, the bayou filled up with several feet of hydrocarbon sludge and often foamed on top, reeking of petroleum.

When the federal Clean Water Act passed in 1972, regulators scrutinized and began controlling point source pollution. Subsequent studies of nonpoint source pollution indicated that urban runoff in the first hour of storm may often contain more suspended solids per unit volume than does raw sewage. Since the 1980s the state, District and local governments have focused on reducing impacts from stormwater runoff through increased stormwater treatment system regulation.

Recently the bayou has seen a return of mullet, redfish, speckled trout and shrimp. Commercial crabbers again set traps throughout the bayou and dolphins have returned, chasing mullet.

Combined cleanup programs of Escambia County and Pensacola for Bayou Chico and other watersheds are projected at \$300 million over 20 years. A city utility fee will fund improvements such as stormwater treatment vaults, which remove sediments and suspended solids before discharge to surface waters.

Jackson Branch still pours untreated stormwater into the bayou, but the District worked with the county to purchase Clark Sand Pits for a stormwater treatment facility and 62-acre park.



Clark Sand Pits

Upper Bayou Chico

Jackson Branch

Eliminated Wastewater Effluent

Jones Swamp Preserve

The Jones Swamp Preserve is growing into a 1,500-acre park, a model effort of the District, Escambia County and the community. Also, Escambia County Utilities Authority (ECUA) is taking steps to remove many septic systems from sensitive areas so they will no longer leach into the bayou.



For the nearby Palafox drainage basin at the "L" Street Pond, the District is designing an innovative stormwater treatment system that settles out contaminants using alum injection with integrated alum sludge disposal. The alum causes the contaminants to sink, forming a sludge that will be disposed of in the ECUA wastewater collection system.



W St. Wetland Restoration

Maggie's Ditch Watershed Retrofit

W St. Sediment Trap

This blue heron is a new permanent resident of Maggie's Ditch since the wetland marsh replaced a trash-filled canal. Many marsh plants, including arrowhead (flowering at right) take up excess nitrogen and phosphorus to help improve water quality. This award-winning stormwater treatment system was designed by the District and built by Escambia County.



Gordon Street Bridge

Railroad Bridge Removed



Citizens of the Bayou Chico Association spurred removal of bridges at the railroad and State Road 292 to enable Bayou Chico to flush. They continue to urge residents to reduce nonpoint pollution.

S.R. 292 Bridge



KEY

- █ Projects completed or underway
- █ Proposed
- █ Conceptual, sediment dredging

0 800 1600 2400

Feet



# 200 YEARS OF DEVELOPMENT

## NATIONAL PRIORITIES LIST SITES Escambia County, Florida



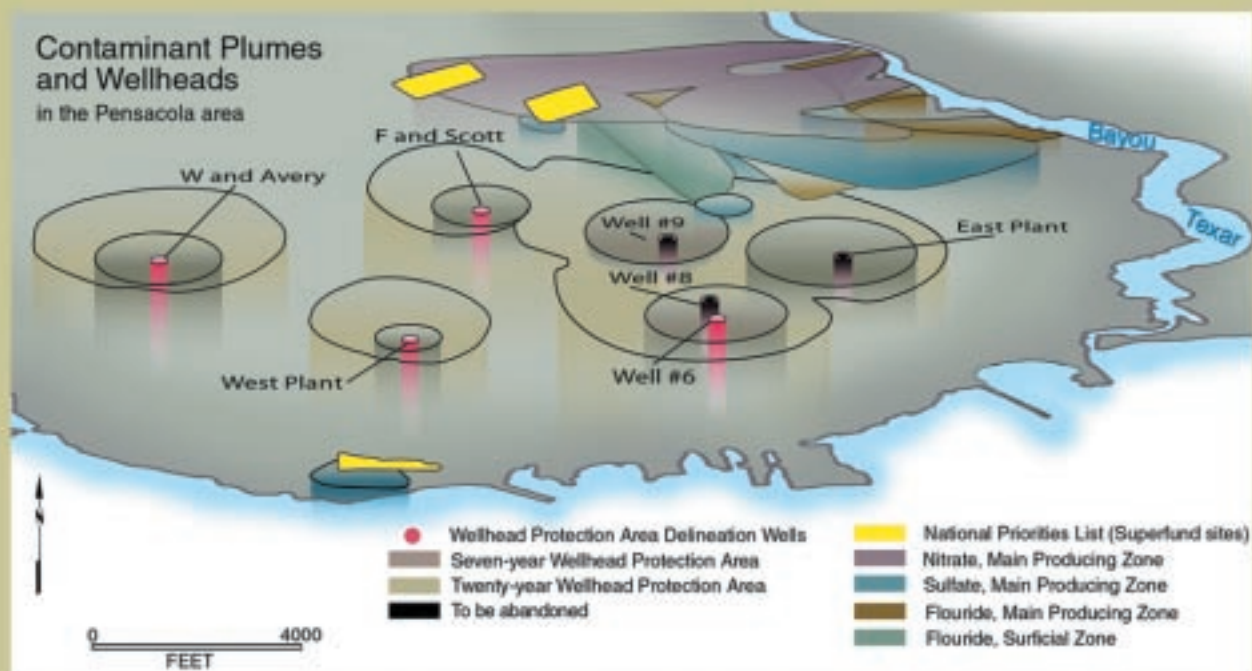
The Pensacola watershed has experienced hundreds of years of human enterprise, from Native American settlement to Spain's 16th century colonizing attempts to the 1785 Panton, Leslie and Co. trading center to the present day.

Over time, discharge of pollutants, sediment and sewage in the poorly flushed bay diminished its health and productivity. Degraded water quality and habitat caused widespread loss of seagrass beds, extensive fish kills and poor environmental health.

Studies by the U.S. Environmental Protection Agency found that the Pensacola Bay system could barely absorb natural runoff. One problem is that fine sediments and particles entering the system from **point and nonpoint source pollution** settle and are retained. **Point source pollution** can be traced to a single source, such as a discharge pipe. **Nonpoint source pollution** comes from diffuse sources, such as stormwater that collects sediment, nutrients, bacteria, pesticides, heavy metals, oil and grease. Another significant pollution source in the Pensacola Bay system is particulate deposit from the atmosphere.

## THE PENSACOLA INDUSTRIAL SUPERFUND PLUMES

The Sand and Gravel Aquifer is susceptible to contamination because it is a near surface aquifer recharged by infiltrating rainfall. A long history of industrial land use has resulted in several significant instances of ground water contamination that still threaten ground and surface waters. The release of dry cleaning solvents has also been a significant problem for public water suppliers, requiring expensive treatment. The Northwest Florida Water Management District assessed the contaminant susceptibility of public wells in 1999 and passed a moratorium on new wells for water supply in contaminated areas. Steps are being taken to abandon Escambia County Utilities Authority wells #8, #9 and East Plant.



## PRESERVATION

Public purchase of natural lands, including **riparian buffers**, is one of the most effective methods of protecting water quality. A **riparian buffer** is a natural area where water enters a watercourse to replenish it. The Northwest Florida Water Management District was created by the legislature in 1972 to manage, conserve, protect and restore ground and surface waters. It has purchased almost 52,000 acres along the Escambia, Blackwater and Yellow rivers, further guarding basins protected by Florida's Blackwater State Forest, Alabama's Conecuh National Forest and other public lands.

Threats to water quality along river lands include gully erosion, fertilizer and pesticide use, residential development and heavy recreational use. Volunteers continue to collect truckloads of trash in annual cleanups.

The Pensacola Bay watershed is among the District's active Surface Water Improvement and Management (SWIM) plans. The program was created by the legislature in 1987 to restore degraded water bodies and protect endangered systems.

Recently the District purchased 1,176 acres in the Escribano Point area, preserving a significant portion of the remaining undisturbed estuarine habitat within the entire Pensacola Bay system. Escribano Point fronts East Bay and the Yellow River Aquatic Preserve and connects to an extensive estuarine network that includes Catfish Basin and Fundy Bayou. This purchase also complements existing District **wetlands** protection and preservation efforts on Garcon Point, an endangered species refuge.



*Escambia River*



**Wetlands** are the earth's kidneys, straining pollutants while also filtering sediments. They provide wildlife habitat, stabilize shorelines with plants binding soil in tight root masses and contribute **detritus** to the food chain. **Detritus** results from the breakdown of organic matter into smaller particles. Wetlands reduce flooding with sponge-like absorbency, measuring out rain water over days and weeks.

## ENVIRONMENTAL PROTECTION

The Florida Department of Environmental Protection (DEP) is responsible for limiting impacts to the environment. Here are some of its interagency and community initiatives:

- **Project Greenshores** will restore 15-20 acres of saltmarsh along a mile of shoreline between the Pensacola Bay Bridge and Pitt Slip Marina. Oyster reefs will be added to cut wave energy and help filter the water. Support comes from grants and public, private and nonprofit partners, including a District-funded study.



- A **Seagrass Monitoring** program to determine extent of seagrass decline in Big Lagoon and Santa Rosa Sound, along with monthly water quality testing, will result in management plans for government. Prop scar restoration is also planned. Additional funding is by the U.S. Environmental Protection Agency's (EPA) Gulf of Mexico Program.
- **Coastal Planting** is carried out by volunteers and civic groups, using 80,000 submerged and emergent plants grown in a greenhouse funded in part by EPA's Gulf of Mexico Program.
- The **Escambia County Dirt Road Project** recently completed testing of three alternative pavements and found two best suited to roads in the county. Water quality testing monitors the effects of stormwater runoff.
- **North Santa Rosa County Water Quality** sampling of Big Coldwater Creek and Pond Creek at Mayo Park pairs DEP with the University of West Florida's (UWF) Center for Environmental Diagnostics and Bioremediation (CEDB) to investigate pollution sources and DNA identification. The Bay Area Resource Council (BARC) contributes funding.
- The **DEP** also tracks bacterial counts in the Pensacola Bay system and publishes the Water Quality Outlook every Friday in the *Pensacola News Journal* and on its website.

## ECOSYSTEM HEALTH

▶ The **Bay Area Resource Council (BARC)** coordinates with many public and private entities to help plan, finance, manage and restore the Pensacola Bay system. It has developed a Pensacola Bay report card to establish performance goals and measures, baseline conditions and other measurements to determine water, air and habitat quality and promote best practices in the watershed.

▶ The **Environmental Education Coordination Team (EECT)** is a group of public/private partnership entities conducting environmental education to serve the Pensacola Bay community with information about natural resources, economic impacts, public health and quality of life. The EECT promotes environmental standards and provides information to enhance environmental awareness and understanding. It was voted by BARC to become a subcommittee and to serve as BARC's education committee.

▶ The **Gulf Coastal Plain Ecosystem Partnership** is a cooperative ecosystem management partnership of the District, Blackwater River State Forest, Conecuh National Forest, Eglin Air Force Base, International Paper, DEP and The Nature Conservancy. Together, they manage more than 910,000 acres in five major watersheds. They protect listed species, restore and protect connected ecosystems and provide ecosystem services, such as prescribed burn efforts.

▶ The **Florida Sea Grant** extension program focuses on water quality of creeks, rivers and estuaries. It educates through publications on marine topics, presentations on water resource protection, marine activities for all ages, consultation, volunteer opportunities and training.



*The Blackwater River is designated an Outstanding Florida Water for its resource value and is among the most popular canoeing venues in the state.*

### OTHER PUBLIC INITIATIVES

• **Real Time Water Quality Monitoring Network**, initiated by DEP, funded by EPA, deploys instruments that monitor a continuous array of water quality measures in Escambia and Blackwater rivers and Pensacola Bay. Data is relayed to the BARC EECT web site every four hours to improve knowledge of how water quality changes over time and distance and to permit tracking of storm or spill events.

• **Bream Fishermen Association** has monitored water quality in the Pensacola Bay system for over 35 years. Members have also joined with **Pensacola Gulf Coast Keepers** to help protect the community's natural resources.

• **Gulf Islands National Seashore** includes barrier island units on Santa Rosa Island, Perdido Key, and peninsular Naval Live Oaks. The National Seashore protects natural coastal barrier ecosystems and provides a recreational resource. It also manages several historic forts and provides educational interpretive programs.

• **Big Escambia Creek Restoration**. Federal, state and local partners in Florida and Alabama are working with the U.S. Army Corps of Engineers to return the lower reach of Big Escambia Creek to its natural channel from a diversion through old sand pits. In the upper reach the creek will be stabilized around a series of log jams.

• **Escambia County's Wetlands and Environmentally Sensitive Areas** program discourages developments that adversely affect wetlands and other sensitive areas and encourages activities that avoid or minimize adverse impacts. To do this, the county drafted and implemented a new wetlands ordinance that provides protection standards, establishes an environmental lands trust fund and presents local permitting and mitigation programs.



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