

**BALDWIN COUNTY COMPREHENSIVE PLAN
CONSERVATION, NATURAL RESOURCES AND OPEN SPACE ELEMENT
DATA, INVENTORY AND ANALYSIS
SEPTEMBER, 2008**

Baldwin County is one of the two coastal counties in the State, and is one of the largest counties east of the Mississippi River encompassing 1,655 square miles. A majority of the County is entirely surrounded by water, except for a 17-mile stretch along the northeastern border. It is surrounded by Mobile Bay, the Tensaw River, and Mobile River to the west; Little River to the north; Perdido River and Perdido Bay to the east; and the Gulf of Mexico to the south. Some of the more prominent waterbodies internal to the county include: Bay Minnette Creek, Styx River, Blackwater River, Fish River, Magnolia River, Weeks Bay, Bon Secour River, the Gulf Intracoastal Waterway, Oyster Bay, Wolf Bay, Soldier Creek, and Palmetto Creek. Approximately a third of the land in Baldwin County is considered wetland.

The cities along the eastern shore of the county: Spanish Fort, Daphne, and Fairhope and the coastal communities of Gulf Shores, Orange Beach, and Foley are the most rapidly developing areas in Baldwin County. Conservation measures need to be examined in these high growth corridors to preserve conservation corridors.

As a coastal county, it contains diverse upland and wetland habitats, such as bottomland hardwood swamps, longleaf pine forests, coastal scrub forest, maritime forest, sand dunes, salt marshes, and many others. According to the County's existing Land Use Cover Map, which was prepared by Photo Science, Inc. in 2005, the percentage breakdown of the current land uses is: 44.4% Forested; 30.2% Wetlands; 17.4% Agricultural; 2.9% Undeveloped; 2.1% Water Bodies; 1.0% Community Facilities; 0.8% Commercial; 0.7% Public Recreation & Open Space; 0.2% Industrial; 0.2% Residential; 0.1% Educational; and 0.02% Historic. Approximately 21% of the land area in the county is owned by timber companies. There is very little change in elevation in the southern portion of Baldwin County where most of the streams and rivers have broad channels and low gently sloping banks.

Baldwin County lies within the East Gulf Coastal Plain physiographic setting. The majority of the land area of Baldwin County lies within the Southern Pine Hills District. The land area bordering the Mobile and Tensaw Rivers falls within the Alluvial-Deltaic Plain District and the coastal area of Baldwin County falls within the Coastal Lowlands District. The typical landform in the Coastal Lowlands District is flat to gently rolling plains, tidal streams, marshes, and wetlands. The Holocene and Pleistocene Series make up the upper 150 feet. Alluvium and coastal deposits are the geologic units. The Pliocene layer is dominated by the Citronelle Formation in the northern portion of the County. The Miocene Series is approximately 300 to 1000 feet thick. The major aquifer system for drinking water in Baldwin County is found in the Miocene and Pliocene series.

Baldwin County is located within the Lower Coastal Plain of Alabama. The county has 5 major regions that influence soil composition. The five regions are the river flood plains and terraces of the Tombigbee and Alabama Rivers, marine terraces, the Citronelle Geologic Formation, Hattiesburg Clays, and areas of recent marine deposits (beaches).

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Soils in the river floodplains mainly consist of silts and clays that have been transported and deposited by the river systems from areas to the north. The origins of these sediments can vary greatly from weathered materials of the Piedmont Region to materials transported from the Black Belt region of Alabama and Mississippi. Soils in this area are typically poorly drained to moderately well drained. The marine terraces of south Baldwin County are derived from overlaying the Citronelle Formation. These soils have sandy surfaces underlain by sandy loam to clayey subsurfaces.

The following sources were used in the preparation of the Conservation, Natural Resources and Open Space Element:

- Strategic Habitat Conservation and the Power of Partnerships. US Fish and Wildlife Service. Atlanta: 2007.
- Comprehensive Conservation and Management Plan of the Mobile Bay National Estuary Program. Mobile: 2002.
- 2006 Alabama Section 303(d) List. Atlanta: 2007.
- 2006-2016 Baldwin County Strategic Plan. Baldwin County: 2007.
- Baldwin County Wetland Conservation Plan. Baldwin County: 2006.
- Baldwin County Zoning Regulations. Baldwin County: 2007.
- Alabama's Comprehensive Wildlife Conservation Strategy. Alabama Department of Conservation and Natural Resources: 2007.
- Orange County, Florida Conservation Element. Orange County: 2000.
- Orange County, Florida Aquifer Recharge Element. Orange County: 2000.
- Strategic Habitat Conservation and the Power of Partnerships. USFWS: 2007.
- Model Native Plant Landscape Ordinance Handbook.
- Lee County Conservation and Coastal Management Element. Lee County: 2004.
- Coastal Connection Scenic Byway Corridor Management Plan. Alabama Association of Regional Councils: 2008.
- Non-Public Water Wells and Water Systems. Iowa Department of Natural Resources: 2007.
- Year-Round Water Conservation Measures and Water Shortage Ordinance. Polk County: 2004.
- Hendry County Water Restriction Ordinance. Hendry County: 2006.
- Hillsborough County Wellhead Policy Revisions. Hillsborough County: 2003.
- Local Government Involvement in Mitigation Banking. EPA: unknown year.
- Stormwater Management Standards for Submission Checklist: Malaysia, unknown year.
- Wetlands Mitigation Banking: Entering a New Era?. USACE: late 1990's(?).

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Overview of Baldwin County 2006-2016 Strategic Plan:

Several issues identified in the 2006-2016 Strategic Plan pertain to the Conservation, Natural Resources and Open Space Element. Applicable excerpts from the Strategic Plan include:

Strategic Issue Statement:

Failure to protect our natural resources would erode our way of life, and adversely impact our economy, water quality, inland coastal waterways, forests and green space, wetlands, and wildlife.

Environment:

Our most significant asset is our natural resources and waterways and the County will work in cooperation with all citizens to protect, preserve, and strengthen our environment.

Waterways

- Identify frequently flooding roadway sites by 2008 and reduce the number of roadway flooding sites by 40% by 2012.
- By 2008, complete a comprehensive storm water plan so as to reduce flooding and maintain water quality.
- By 2011, decrease the pollution and storm water runoff in the County waterways so as to improve water quality and maintain EPA and ADEM standards.

Open Space and Wetlands

- By 2012, increase and protect mandated green/wetlands space by 50%. (1,250 acres in 2006 and 625 acres added for a total of 1,875 acres)
- Adopt regulations that require all new development to meet 100-year flood events.
- Develop open space plan-specific component of the comprehensive plan.
- By 2009, protect a minimum of 500 acres of habitat of species of greatest conservation need with an emphasis on priority areas depicted in the State Wildlife Action Plan.

Citizen Participation

- By 2011, create an alternate fuels program that will reduce the County's dependency on fossil fuels by 2%.
- By 2010, 70% of all graduating seniors in Baldwin County Public Schools will have participated in environmental programs and community projects. (Environmental Classes and Clubs)
- By 2014, increase citizen awareness of environmental issues with 35% of citizens reporting they are better informed of environmental issues related to: Pollution, Littering, Recycling, Value of our environment, and Stormwater issues
- County is recycling 30% of solid waste generated by County buildings by 2009.
- County is recycling 30% of solid waste generated by residents of unincorporated areas of County by 2009.

Enforcement

- Design enforcement mechanism and fines/citations for illegal dumping and other environmental issues with inter-jurisdictional coordination by 2008. (pending legislation)
- Adopt regulations that require all new development to meet 100 year flood events.

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- By 2010, oversight of sewer services and septic systems to include consumer protections and decrease spills by 33%. (pending legislative approval)

Planning and Zoning

- Ensure construction in flood zones are in compliance with federal regulations so that citizens and businesses can obtain low cost, affordable flood insurance within the County permitting jurisdiction. (ongoing)

Key Measures

Environment

- 30% of material kept out of landfill through recycling and conversion to energy (11,500 tons).

Planning and Zoning

- Completion of comprehensive plan.

Public Safety

The County Commission and other elected officials in the County are committed to ensuring safe communities with effective programs and an efficient, integrated justice system for the citizens and visitors to the County.

Emergency Preparedness

- By 2016, implement a countywide/regional interoperable communication system that provides seamless communications between the multiple governmental agencies to support first responders.
- By 2010, have incident level interoperable communications with an implementation plan to include updates and drills.
- By 2020, the evacuation route north of I-10/65 will be extended (CR-83) in order to maintain an 18-24 hour staged evacuation, including vulnerable and immobile populations.
- Maintain a minimum rate of 2% occupancy space for emergency shelters for the residents in the County and at a minimum rate of 10% in the most vulnerable areas.
- Following a catastrophic event, the County will be prepared to open 100% of its distribution sites within 72 hours.
- By 2016, ensure 80% of mobile home/RV communities and multi-family dwellings in excess of 25 units have access to a tornado/hurricane shelter within new developments.
- By 2010, the County will complete an assessment of volunteer fire districts/search and rescue squads in order to ensure the adequacy of coverage and meet growth in the County.

Ecosystems of Baldwin County:

There are 5 priority areas for conservation of terrestrial and estuarine species in Baldwin County. They are Grand Bay Savanna, Gulf Islands, the Mississippi/Alabama Stateline Bogs, Splinter Hill Bog, and Tensaw Delta. First, the Grand Bay Savanna eco-region is associated with Wet Pine Flatwoods, Floodplain Forest, Dry Longleaf Pine Forest, Scrub/Maritime Forest, Bog/Seep, Isolated Wetland, and Estuary/Maritime geography. The Gulf Islands eco-region is composed of Wet Pine Flatwoods, Dry Longleaf Pine Forest, Scrub/Maritime Forest, Bog/Seep, Beach/Dune, and Estuary/Marine geography. The Mississippi/Alabama Stateline Bogs is

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composed of Wet Pine Flatwoods, Dry Longleaf Pine Forest, and Bog/Seep geography. The Splinter Hill Bog is made up of Wet Pine Flatwoods, Floodplain Forest, Dry Longleaf Pine Forest, and Bog/Seep geography. Finally, the Tensaw Delta is made up of Dry Hardwood Forest, Mesic Hardwood Forests, Wet Pine Flatwoods, Floodplain Forest, Dry Longleaf Pine Forest, Swamp, and Scrub/Maritime Forest geography.

Wet Pine Savanna and Flatwoods

These open pine woodlands occupy sandy flatlands principally in the Gulf Coast Flatwoods of the Southeastern Plains. Though this habitat is subject to seasonally high water tables, fire frequency is high. Overstory vegetation is characterized by longleaf pine and slash pine. The understory ranges from dense shrubs to open and herbaceous-dominated, and is heavily influenced by fire history. This habitat shares many wildlife species with dry longleaf pine forest, but the **Flatwoods Salamander** is found only in this habitat. **Splinter Hill Bog** located in Baldwin County is of high concentration.

Much of the habitat has been lost due to drainage, development, agriculture, conversion to pine plantations, and fire suppression. This habitat is a component of a broader longleaf pine forest and savanna ecosystem, considered one of the most endangered ecosystems in the county today. On some frequently burned federal lands, the habitat is in good condition. On the other hand, the habitat is in fair to poor condition on other public lands and most private/industrial lands. Without adequate controlled land burns, canopy closure will increase along with shrub dominance, grasses, forbs, and other finer-fuel components will decline, further altering the fire regime dynamics. Prescribed growing-season fire needs to increase dramatically in this habitat type.

There are 3 (P1) or Priority 1 amphibious species associated with Wet Pine Savanna and Flatwoods: **Flatwoods Salamander**, **Gopher Frog**, and **Dusky Gopher Frog**. Priority 1 species are critically in peril, at risk of extinction/absence because of rarity, have restricted distribution, decreasing population trend/population viability problems, and specialized habitat needs/vulnerability due to natural/human-caused factors. Immediate research and/or conservation action are required. There are 3 reptiles that are classified as P1. They are the **Eastern Indigo Snake**, **Southern Hognose Snake**, and the **Black Pine Snake**. There are 2 birds that are classified as Priority 1. They are the **Henslow's Sparrow** and the **Red-Cockaded Woodpecker**. There are no Priority 1 mammals, but there are 6 Priority 2 mammals. They are the Southeastern Pocket Gopher, the Northern Yellow Bat, the Long-tailed Weasel, the Southeastern Myotis, the Eastern Spotted Skunk, and the Marsh Rabbit. Of the reptile species, the most commonly known snakes, the Eastern Diamondback Rattlesnake and the Eastern Coral Snake, are both Priority 2 species. Of the classified Priority 2 birds, the Short-eared owl is the most commonly known.

There are problems affecting the species/habitat in the Wet Pine Savanna and Flatwoods Eco-Region. They are as follows:

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Fire suppression and lack of fire	Altered hydrology due to drainage ditches, raised floodbeds, fire plow lines, etc.	Conversion to other pine species	Intensification of forestry practices (site preparation, heavy stocking densities) leading to closed canopy forests with little herbaceous groundcover.
Urban development and habitat fragmentation.	Lack of old growth characteristics	Habitat loss affecting species that rely on understory management and open pine ecosystems.	Exotic species
Pine straw raking impacting understory habitat	Current distribution and status, as well as knowledge of various aspects of life history and biology are poorly know for most GCN species.	Erosion from mechanized vehicle trails and other activities near biologically significant sites.	Insufficient conservation-related educational outreach about biologically sensitive areas and species.

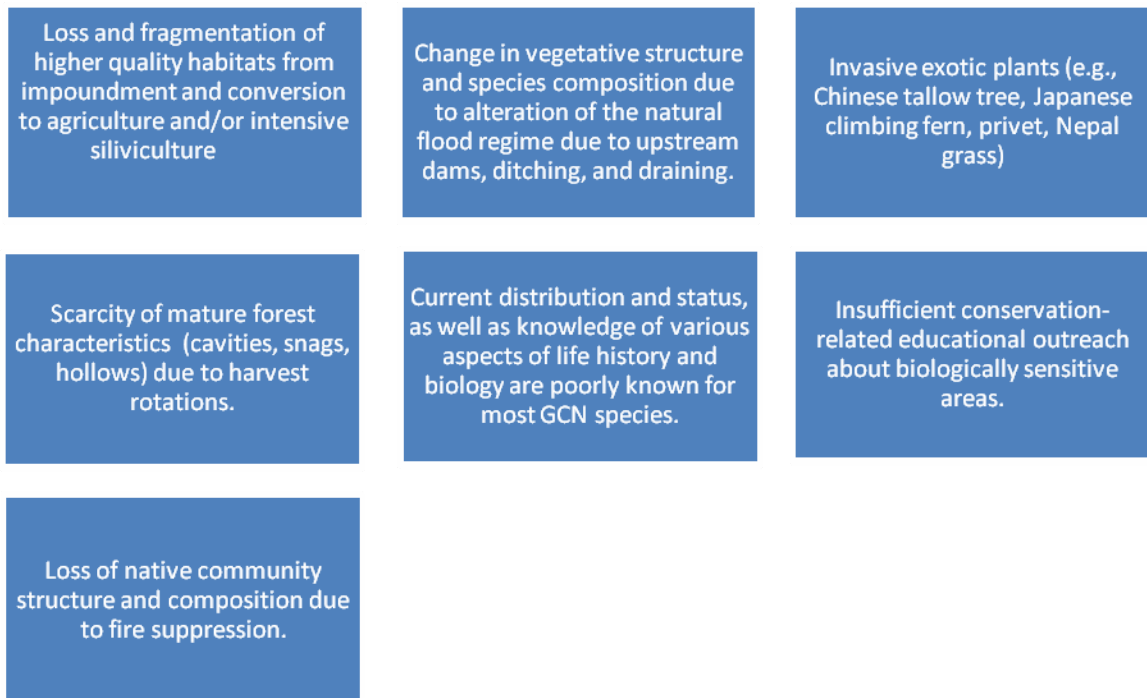
Floodplain Forests

This habitat category is characterized by periodic flooding and flood-related environmental factors (wetness, scouring, deposition of material, and input of nutrients) affect vegetational composition and dynamics. The **Mobile-Tensaw River Delta** is found to be a high-quality site for this habitat, which is located in Baldwin and Mobile Counties. The Grand Bay Savanna is also found to be characterized with this habitat as well. The Grand Bay Savanna and the Splinter Hill Bog area also priority areas for conservation of this habitat. Forests of large floodplains and bottomlands often include depositional landforms such as levees, sloughs, ridges, terraces, and abandoned channel segments. Floodplain forests above the Fall line are generally quite distinct from those of the Southeastern Plains, because of the steeper river gradients and harder rocks. **Bald Cypress** and **Tupelo Gum** trees are common components below the Fall Line, but not above. Vegetation along the larger streams and rivers generally includes forests dominated by bottomland hardwood species and other trees tolerant of flooding.

There are 30 identified GCN species in floodplain forests. The amphibians of Priority 1 concern are the **Southern Dusky Salamander**, **River Frog**, and **One-toed Amphiuma**. There are 5 reptiles of Priority 2 concern, but no Priority 1 rankings. They are the **Coal Skink**, **Southeastern Five-lined Skink**, **Rainbow Snake**, **Eastern Kingsnake**, and **Speckled Kingsnake**. There is one know extinct bird species, that being the **Ivory-billed Woodpecker**. There is one Priority 1 bird, which is the **Cerulean Warbler**. There are 8 Priority 2 birds. There are 4 Priority 1 mammals. They are the **American Black Bear**, the **Rafinesque’s Big-eared Bat**, **Gray Myotis**, and the **Indiana Bat**.

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Much of this habitat has been lost due to impoundments. Power generation and regulation of water flow create unnatural flood regimes, affecting large areas downstream from dams. Extensive erosion of uplands, caused by poor agricultural practices dating back to colonial times, transported large amounts of sediment into floodplains. Large floodplains often have substantial areas in cultivation. Many exotic plant species have invaded floodplains, perhaps more than any other habitat type in Alabama. The problems affecting the floodplain habitat are as follows:



Dry Longleaf Pine Forests

Longleaf pine forests were historically widespread in Alabama, occurring above the Fall Line in the Ridge and Valley and Piedmont and below the Fall Line in the Southeastern Plains. Longleaf pine habitats range from moist to very well drained sites, including mesic pine flatwoods, pine/scrub oak sandhill, and xeric sandhill scrub. Mountain longleaf communities occur on rugged ridges north of the Fall Line, including some of Alabama's highest elevations. Frequent fire maintains a canopy dominated by longleaf pine, with wiregrass or other grass/herb ground cover. When fire is infrequent, scrub oaks, other hardwoods, and shrubs become common in the midstory and shade out native grasses and forbs. Embedded within longleaf pine habitats are fire-dependent herbaceous bogs and isolated wetlands that contribute much of the biodiversity of the region. Baldwin County is ranked 2nd in the Southeastern Plains in total natural and planted longleaf acreage. There are 5 priority areas for conservation action in Baldwin County: Grand Bay Savanna, Gulf Islands, Mississippi/Alabama Stateline Bogs, Splinter Hill Bog, and the Tensaw River Delta.

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Longleaf pine was once Alabama’s most abundant tree, but it has been greatly reduced in its extent, with much of its range now occupied by agriculture and/or forestry operations. Longleaf pine communities now exist in just 3% of their previous range throughout the Southeast. Longleaf pine forest and savanna is considered one of the most endangered habitats in the country today. On some frequently burned federal lands and some private hunting preserves, the habitat is in good condition. Habitat is in fair to poor condition on other public land and most private and industry lands.

Without the appropriate fire regime, canopy closure will increase along with shrub dominance, and grasses, forbs, and other finer-fuel components will decline, further altering the fire regime dynamics. Prescribed growing-season fire needs to increase dramatically in these systems, midstory reduction is essential.

Loss of quantity and quality of longleaf pine forest and the highly fragmented nature of remaining tracts has resulted in the corresponding decline of a large number of terrestrial vertebrates that can be considered longleaf specialists, which are found either primarily or exclusively in longleaf-dominated habitats. More Priority 1 species occurs in this habitat than any other habitat. There are problems affecting the species and Longleaf Pine Forest habitat. They are as follows:



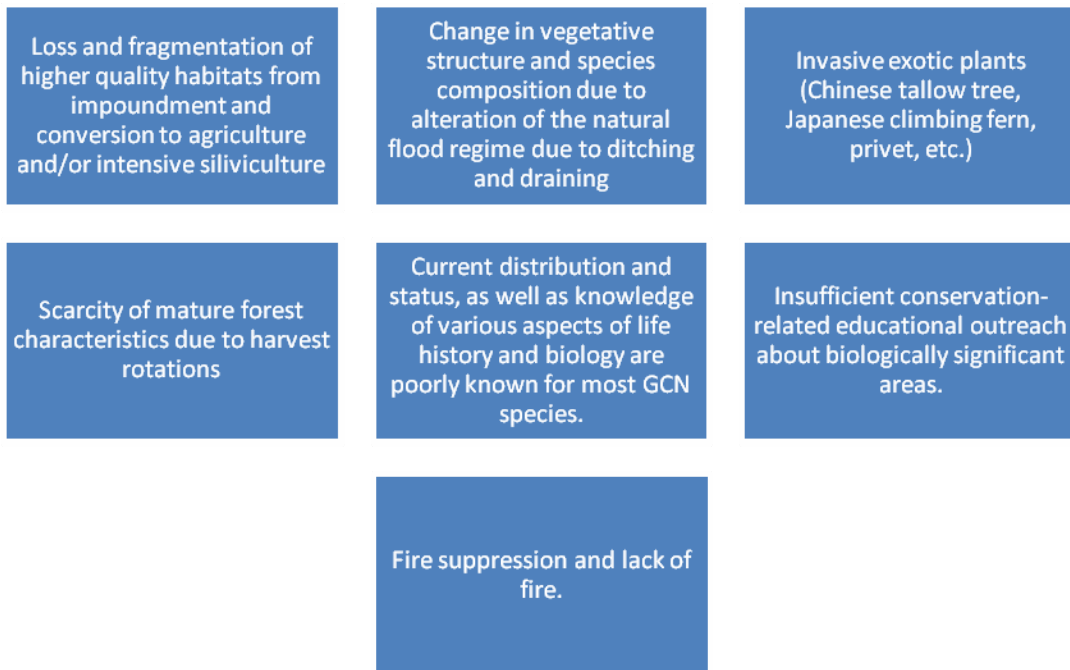
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Swamps

A representative high quality site for swamps is the **Mobile-Tensaw River Delta**, which is located in Baldwin County. Swamps are regularly flooded forested areas dominated to varying degrees and composition by cypress, tupelo, and wetland oaks, often with substantial shrub or herbaceous vegetation. Many swamps develop in stream floodplains, where there is considerable overlap in this habitat and Floodplain Forests, but large peat-bottomed bay swamps of the Southeastern Plains are not associated with streams, and do not receive over-bank flooding. Floodplain swamps are often created by beaver dams. Coastal tidal swamps may be flooded twice daily. Swamps are prone to long-duration standing water, and are normally protected from fire except during extreme droughty periods.

Much of the swamp habitat has been drained for agricultural or silviculture and inundated by reservoirs. Extensive erosion of uplands, caused by poor agricultural practices dating back to colonial times, transported large amounts of sediment into floodplains and associated swamps. Many exotic plant species have invaded swamps.

There are 25 GCN (either Priority 1 or 2) species located in Baldwin County. There are also 35 additional Priority 3 species that are considered to be of Moderate Conservation Concern. There is the **Southern Dusty Salamander** and **River Frog** that are Priority 1 amphibians. There is the **Eastern Indigo Snake** and **Alabama Red-bellied Turtle** that are Priority 1 reptiles. The **Henslow’s Sparrow** and **Rafinesque’s Big-eared Bat** are the respective Priority 1 bird and mammal species. There are problems associated with swamps. They are as follows:



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Maritime Forest and Coastal Scrub

This mosaic of woody vegetation, often dominated by live oak, is present on barrier islands and near-coastal strands. Such areas include relatively stabilized coastal dunes, sometimes with a substantial shell component. Vegetation structure and composition are influenced by salt spray, coastal winds, and extreme disturbance events, especially hurricanes. The most heavily salt-influenced examples may appear pruned or sculpted. Fires are infrequent. There are 3 priority areas in Baldwin County: **Grand Bay Savanna, Gulf Islands, and the Tensaw River Delta.**

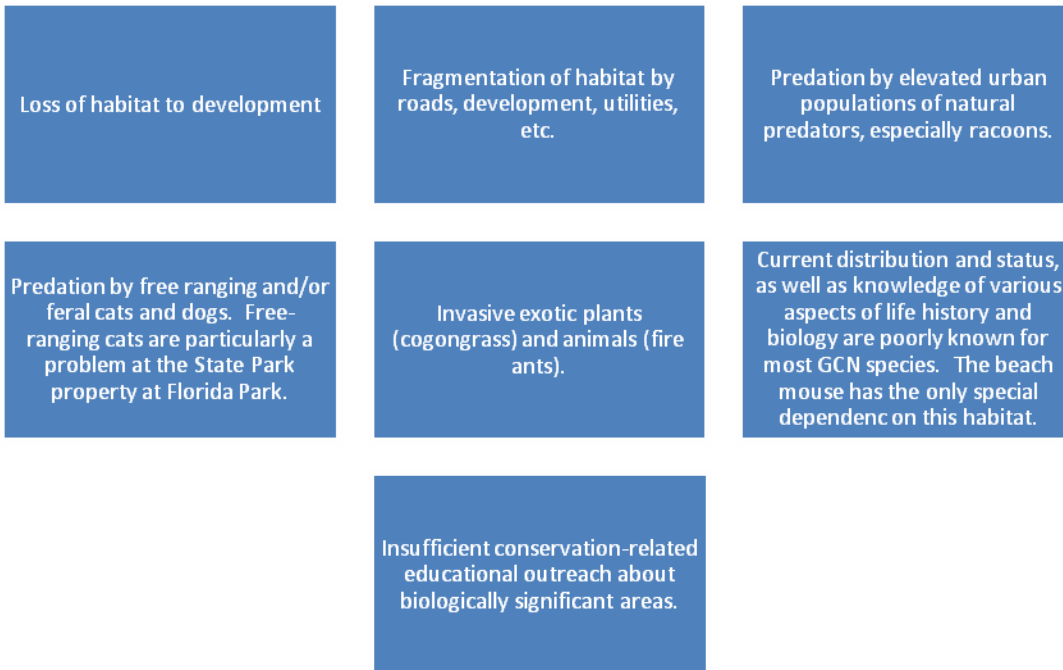
Although spring migrant birds typically expend energy to fly farther inland before making first landfall, these coastal forests are of critical importance to bird survival during the so-called fallout conditions, when weather is inclement and birds are near exhaustion. In Baldwin County, the habitat area is found south of the Intracoastal Waterway from Perdido Bay to Fort Morgan. High quality sites include portions of the Bon Secour National Wildlife Refuge and the inland portion of Gulf State Park east of the golf course in Baldwin County.

The location of Alabama's remaining maritime forest and coastal scrub habitats is fairly well known, and virtually all is highly fragmented. Most of the habitat has been lost entirely due to coastal developments or is interspersed with houses.

There are 21 GCN species located in this habitat. There are 2 amphibians, 9 reptiles, 4 birds, and 6 mammals. There are 2 amphibians of Priority 1 concern. They are the **Gopher Frog** and **Dusky Gopher Frog**. There are 2 Priority 1 reptiles and 3 Priority 1 mammals. They are the **Eastern Indigo Snake**, the **Southern Hognose Snake**, the **Rafinesque's Big-eared Bat**, the **Alabama Beach Mouse**, and the **Perdido Key Beach Mouse**.

There are problems affecting the species and habitat of the maritime forest and coastal scrub community. They are as follows:

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Bogs and Seepage Communities

Seepage bogs, non-boggy seeps, and streamhead seeps occur in the Piedmont and Southeastern Plains. In the Southwestern Appalachians and Ridge and Valley, patches of seepage forests occur on streamhead swales or on broad sandstone ridges where soils are sandy and saturated due to a combination of perched water table and seepage flow. These range in condition from open woodlands to forests. Bogs are located in **Grand Bay Savanna, Gulf Islands, the Mississippi/Alabama Stateline Bogs, the Splinter Hill Bog, and the Tensaw River Delta.**

These are all readily distinguished from adjacent upland habitats by the presence of wetland flora and soils, as well as seepage. They may be somewhat less clearly distinguished from adjacent floodplain habitats, but they are saturated without having standing water as floodplain pools do. These differences are reflected in the vegetation.

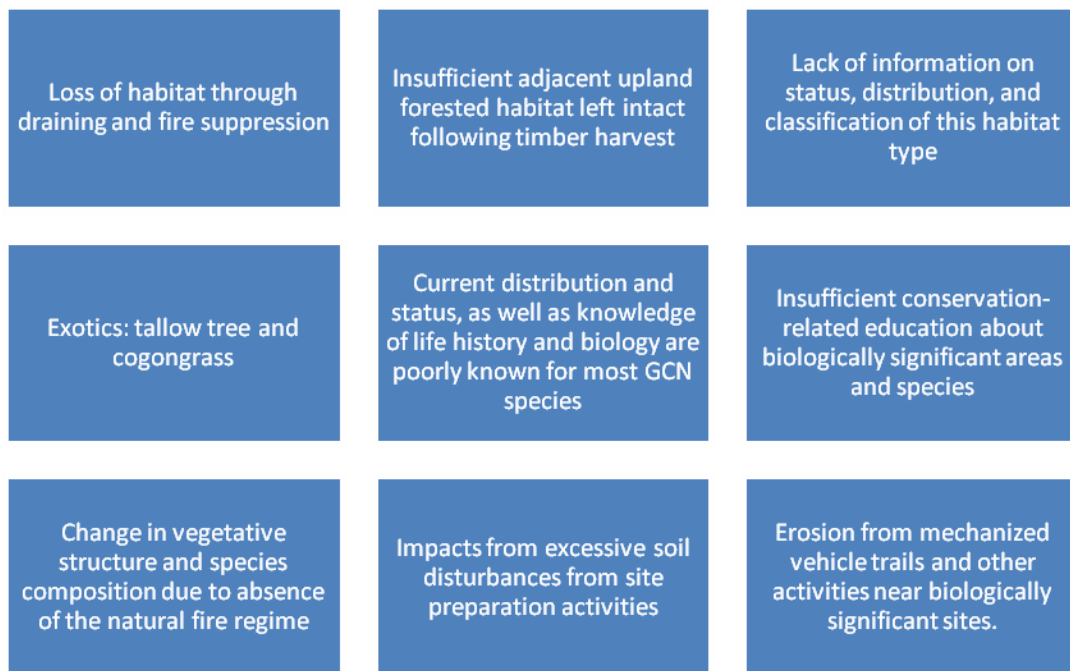
There are 15 GCN species that includes 1 crayfish, 2 amphibians, 6 birds, and 4 mammals. The only Priority 1 species is the Henslow’s Sparrow. The rest of the species in this habitat are classified as Priority 2.

Most of Alabama’s bog habitats have been degraded or lost due to drainage for agriculture and/or silviculture and succession to other forest types resulting from fire suppression. Many have been converted into ponds and others have been damaged by hogs and cattle. Of the

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original Gulf Coast pitcher plant habitats of the southeastern US, less than 3% remained as degraded habitat, and less than one percent remained as pristined habitat by the latter part of the twentieth century. Remnant bogs on private and public lands are often in need of prescribed burning, and many may require mechanical removal of established established woody species such as titi and red maple.

The problems associated with bogs and seepage communities are as follows:



Isolated Wetlands

Wetlands surrounded by upland and not drained by streams may be found almost anywhere in Alabama, with somewhat higher densities in the Interior Plateau and Southeastern Plains regions. These are embedded habitats in that they may be surrounded by other habitats discussed in this document, such as Dry Longleaf Pine Forest, Mesic Forest, Maritime Forest and Coastal Scrub, Agricultural and Disturbed, and others. These highly variable districts form in depressions where precipitation collects, on former floodplains no longer inundated by seasonal river flows, in swales between coastal dunes and in other seasonally wet sites. Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Wetlands may become dry in the summer and not support fish, making them particularly valuable to certain pond-breeding amphibians. Depending on hydrology and soils, isolated wetlands may vary from open ponds to herb-wetlands, shrub-wetlands, or tree-dominated wetlands. The Grand Bay Savanna is an ecological area known to have wetlands in Baldwin County.

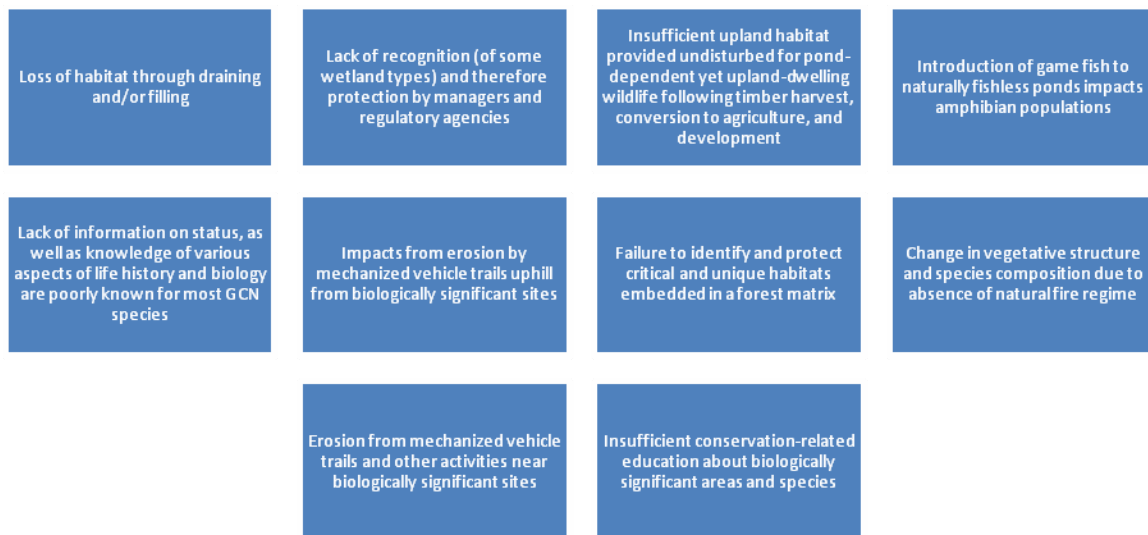
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Isolated wetlands are vital habitats for numerous wildlife species, including endangered and threatened birds, reptiles, amphibians, invertebrates, and plants. Many thousands of isolated wetlands exist in Alabama, but they have not been inventoried, so the actual number is unknown. The loss or degradation of these wetlands negatively impacts native fauna, flora, soils, and water quality.

This habitat type also includes water bodies produced by human actions. Most are ponds built for a variety of reasons including aesthetic appreciation, livestock watering, irrigation, aquaculture, and storm water management. Other isolated wetlands have been created by fragmentation from development where they represent remnants of once larger wetland complexes. A high-quality site for isolated wetlands in Baldwin County is the Bon Secour National Wildlife Refuge

Statewide, many isolated wetlands have been ditched, filled, deepened, or otherwise altered. At the Bon Secour National Wildlife Refuge, the isolated wetlands are preserved so the statewide problem of this habitat is not prevalent at this location. This area becomes a very reliable study area for testing isolated wetlands and detecting the native plants and animals for this habitat. There are 13 identified GCN species and 44 Priority 3 species of Moderate Conservation Concern. Of the Priority 1 species, they are the Flatwoods Salamander, Gopher Frog, and Dusky Gopher Frog for amphibian distribution. Other Priority 1 rankings are the Eastern Indigo Snake for reptiles and Henslow’s Sparrow for birds.

The problems associated with this habitat are as follows:



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Beach and Dunes

Beach and dune complexes are dynamic systems of constantly changing habitats characterized by sandy soils, sparse, saltwater-adapted grasses and shrubs, and interdunal pools and swales. Winds, tides, salt spray and hurricanes impact these habitats as the sands and the vegetation that they support constantly ebb and flow in response.

Vegetated coastal dunes consist largely of herbaceous and embedded shrublands on barrier islands and other near-coastal areas where salt spray, saltwater overwash, and sand movement are important ecological forces. A number of diagnostic and endemic plant species characterize this habitat, including the **Sandhill Rosemary, Woody Goldenrod, Beach Sand-squares,** and the **Gulf Rockrose**. The outermost zone of vegetation extending seaward from foredunes is characterized by Sea Oats and Gulf Bluestems. Wildlife species of beaches and dunes are the beach mouse, sea turtles, nesting and wintering shorebirds that are incapable of surviving in other habitats (in the case of sea turtles), and their welfare is tied to the welfare of this narrow coastal strip. Representative high-quality sites within Baldwin County are the **Bon Secour National Wildlife Refuge, the Gulf State Park, the Dauphin Island Bird Sanctuary,** and **Pelican Island (all considered within the Gulf Islands conservation network).**

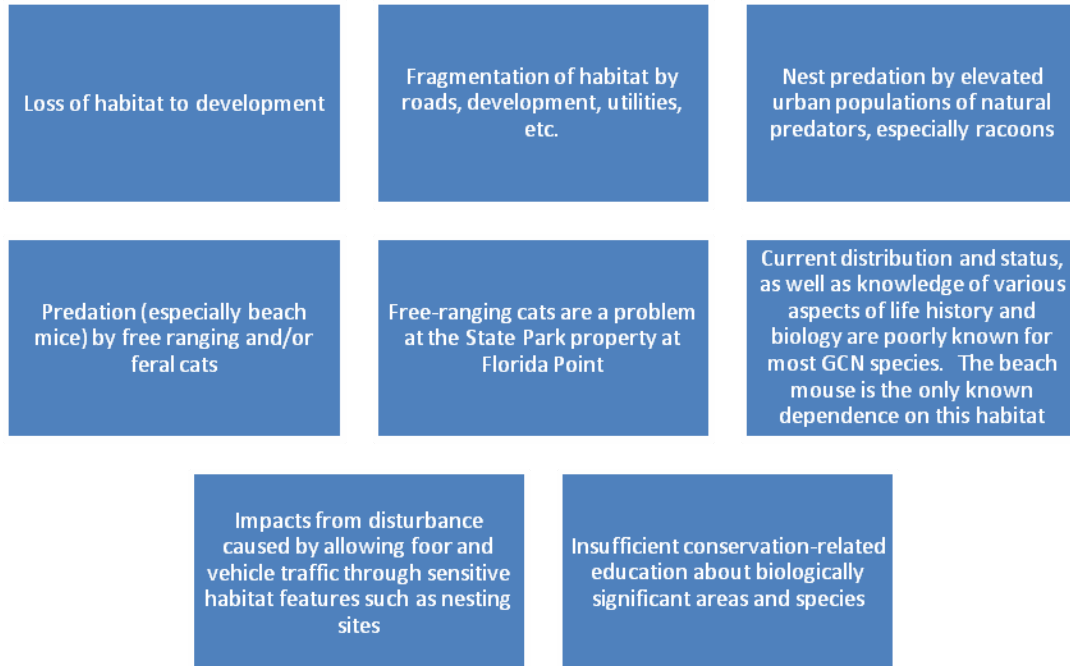
Alabama's beach and dune systems are extremely attractive to tourists and vacationers. Prior to the landfall of Hurricane Frederick in 1979, development along the Alabama coastline was intermittent and slow. The development of beachfront property over the last 25 years has been dramatic and has driven land prices to extremely high levels. As a result, little undeveloped beachfront property exists in Alabama outside of state and federal ownership.

Because beach and dune complexes are both highly valued for development and also provide critically important habitat for a variety of unique plant and animal assemblages, conflicts have arisen between conservationists and developers regarding the future use of the remaining lands, and those private developments that currently impact the nearby public lands. For example, light pollution from nearby development is particularly disruptive to sea turtle nesting behavior, and free-ranging pets, such as house cats, impose direct mortality on imperiled forms.

There are 12 known GCN species that are located in beaches and dunes. There are 3 Priority 1 reptiles, 3 Priority 1 birds, and 2 Priority 1 mammals. The **Loggerhead Sea Turtle, Green Sea Turtle, Mississippi Diamond-backed Terrapin, Snowy Plover, Piping Plover, Wilson's Plover, Alabama Beach Mouse,** and the **Perdido Key Beach Mouse** are all species of the highest conservation concern.

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The problems associated with the beach and dunes habitat are as follows:



Estuarine and Marine

Restricted to Alabama's coastal communities of Baldwin and Mobile, this habitat includes salt and brackish tidal marshes and adjacent marine waters, including seagrass beds. Representative high-quality estuarine sites include **Weeks Bay National Estuarine Research Reserve**, **Bon Secour National Wildlife Refuge**, and **Holland Wildlife Management Area** within Baldwin County. High quality marine sites include offshore hardbottoms and the area known as the Pinnacles. Priority ecologic areas for conservation action are the Grand Bay Savanna area, Gulf Islands, Gulf of Mexico, and Mobile Bay.

Salt marshes and adjacent shallow waters support many fish species of commercial interest, and are important to a number of other terrestrial and aquatic wildlife species. These habitats are typically associated with mud-bottomed bays behind barrier islands. Dauphin Island located in Baldwin County has a very extensive brackish needlerush marsh area.

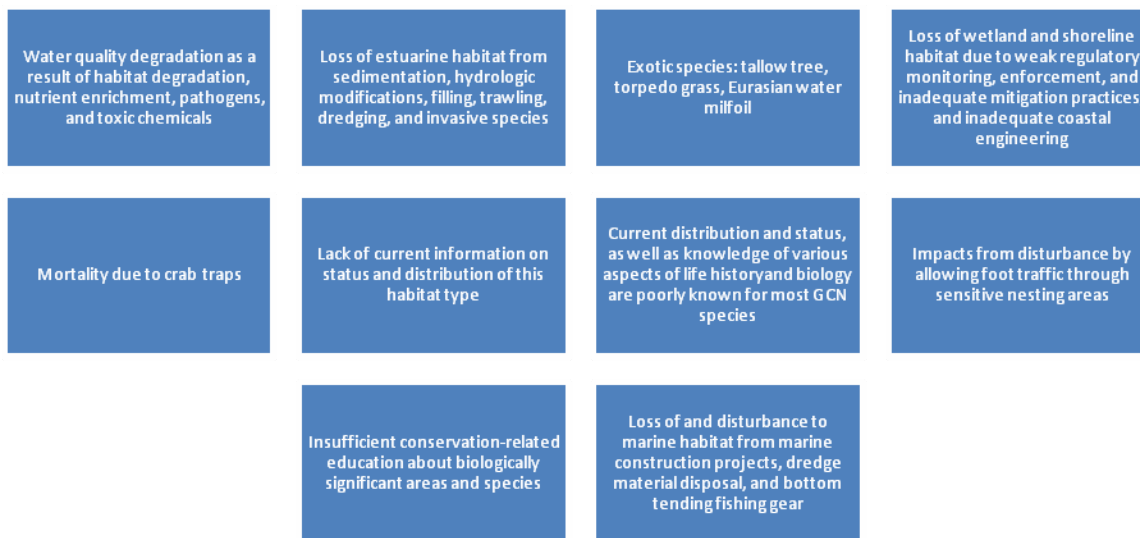
Seagrass meadows are the most productive habitats in estuarine waters of the Gulf Coast. Seagrasses provide food for wintering waterfowl and important spawning and foraging habitat for commercially important finfish and shellfish. Seagrass communities support sea turtles and manatees, both endangered and threatened species. Submerged seagrass beds are found in a patchy distribution behind protective barrier islands and in near-shore areas. Beds occur in greater numbers in Perdido Bay. Wigeongrass is tolerant of freshwater and consequently an important component of this habitat. American Wildcelery, Shoal Grass, Southern Naiad, and Slender Pondweed.

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There are 11 GCN species identified within the estuarine and marine habitats. The Loggerhead Sea Turtle, Green Sea Turtle, Leatherback Sea Turtle, Kemp’s Ridley Sea Turtle, Mississippi Diamond-backed Terrapin, and the West Indian Manatee are all Priority 1 species.

Non-freshwater marshes surrounding Mobile Bay declined by more than 10,000 acres from 1955 to 1979, representing a loss of 35%, but that decline has slowed in recent years. Losses of seagrass beds in the Northern Gulf of Mexico over the last 50 years have been extensive. Most estuaries have lost from 20 to 100% of their seagrass beds. It is estimated that 50% or more of Alabama’s seagrass beds were lost from the 1940’s to 1979. Coastal population growth and accompanying municipal, industrial, and agricultural development has been recognized as a contributing factor. The environmental quality of the habitat has deteriorated with increased turbidity and decreases in water quality resulting from dredging, boating activities, and other development pressures. Losses of seagrasses may signal water quality problems in Alabama’s coastal waters.

The problems associated with estuarine and marine areas are as follows:



Overview of Baldwin County Wetland Conservation Plan

- The objective of the Baldwin County Wetland Conservation Plan was to provide local decision-makers the best tools possible to make wise land use decisions regarding Baldwin County’s wetland resources. There were four major tasks of this project. First, the development of a Wetland Protection Overlay District (WPOD) was incorporated into the Baldwin County Zoning and Subdivision Regulations. Another task was the development of a GIS wetland data layer containing information on the location, type, and functional capacity of wetlands throughout Baldwin County. Third, this project implemented a wetland


















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education/outreach program for area stakeholders. Finally, wetland restoration/construction projects were designed and implemented at selected sites throughout the County.

- There are approximately 300,000 acres of wetlands in Baldwin County. Wetlands perform many natural functions such as: floodwater storage; sediment, toxicant, and nutrient removal; groundwater recharge; and habitat for fish and wildlife.
- Wetland protection is accomplished successfully at the local level. The Baldwin County Subdivision Regulations prevents the platting of entire lots in areas that are considered wetland. Also the Baldwin county Zoning Regulations require an upland buffer between a jurisdictional wetland and land disturbance activity within a zoned area.
- National Wetland Inventory (NWI) was acquired, merged, edge-matched and verified using color infrared photography. Baldwin County staff and United States Army Corps of Engineers (USACE) staff ground-truthed the wetland data through a rigorous wetland validation project. It was determined that the Baldwin County Digital Wetland Layer is 86% accurate in representing jurisdictional wetlands.
- In order to assess the functions of each wetland area throughout the Country, a remote functional assessment model was developed using GIS software through the integration of other remotely sensed data layers such as flood zones, National Wetland Inventory data, and endangered species. The results provide watershed-based wetland restoration strategies for Baldwin County's wetlands.
- Education and outreach programs were implemented throughout the project period through speaking engagements and public meetings.
- This document summarizes the 4 years of effort and creates a framework for future wetland protection efforts in Baldwin County, Alabama.

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**Federal Listed Species Known to Occur in
Baldwin County, Alabama**

-  [Bald Eagle](#)
-  [Wood Stork](#)
-  [Red-cockaded Woodpecker](#)
-  [Eastern Indigo Snake](#)
-  [Alabama Red-bellied Turtle](#)
-  [Gulf Sturgeon](#)
-  [Alabama and Perdido Key Beach
Mice](#)
-  [Piping Plover](#)
-  [Gopher Tortoise](#)
-  [Atlantic Green Sea Turtle](#)
-  [Kemp's Ridley Sea Turtle](#)
-  [Loggerhead Sea Turtle](#)
-  [Flatwoods Salamander](#)
-  [Alabama Sturgeon](#)
-  [Inflated Heelsplitter Mussel](#)
-  [Heavy Pigtoe Mussel](#)
-  [American Chaffseed](#)



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Section 303 Classified Waterbodies in Baldwin County

Assessment Unit ID	Waterbody Name	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	Draft TMDL Date
AL03170009-0102-100	Bayou La Batre	R	L	Escatawpa	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1997	5.46 miles	Portersville Bay / Its source	2008
AL03170009-0201-100	Mississippi Sound	E	M	Escatawpa	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1994-97	93.72 square miles	Segment classified for shellfish harvesting	2008
AL03170009-0201-200	Portersville Bay	E	L	Escatawpa	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Municipal	1996	18.81 square miles	1000 feet west of outfall / Bayou la Batre Utilities outfall	2008
AL03170009-0201-300	Grand Bay	E	L	Escatawpa	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	On-site wastewater systems	2003-2005	30.73 square miles	Grand Bay	2013
AL03160204-0505-100	Mobile River	R	L	Mobile	Mobile	Limited Warmwater Fishery	Metals (Hg)	Unknown source	2000	7.61 miles	Mobile Bay / Spanish River	2013
AL03160204-0303-102	Mobile River	R	L	Mobile	Baldwin Mobile	Fish & Wildlife	Metals (Hg)	Unknown source	2000	20.90 miles	Spanish River / Cold Creek	2013
AL03160204-0106-101	Cold Creek	R	L	Mobile	Mobile	Fish & Wildlife	Metals (Hg)	Contaminated sediments Flow regulation/modification	1993	4.21 miles	Mobile River / Dam 1 1/2 miles west of US Highway 43	N/A
AL03160204-0201-200	Middle River	R	H	Mobile	Mobile Baldwin	Fish & Wildlife	Metals (Hg)	Unknown source	2002	9.72 miles	Tensaw River(RM 20.6) / Tensaw River(RM 37.7)	2013
AL03160204-0404-101	Chickasaw Creek	R	H	Mobile	Mobile	Limited Warmwater Fishery	Metals (Hg)	Unknown source	2000	4.43 miles	Mobile River / US Highway 43	2013
AL03160204-0404-102	Chickasaw Creek	R	H	Mobile	Mobile	Fish & Wildlife	Metals (Hg)	Unknown source	2000	6.64 miles	US Highway 43 / Mobile College	2013
AL03160204-0402-100	Chickasaw Creek	R	H	Mobile	Mobile	Swimming Fish & Wildlife	Metals (Hg)	Unknown source	2000	26.82 miles	Mobile College / Its source	2013
AL03160204-0503-102	Bay Minette Creek	R	H	Mobile	Baldwin	Fish & Wildlife	Metals (Hg)	Unknown source	2000	18.15 miles	Bay Minette / Its source	2013
AL03160204-0504-101	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Pesticides (Chlordane)	Unknown source	2000	2.04 miles	Mobile River / Toulmins Spring Branch	2008
AL03160204-0504-101	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Organic Enrichment/DO	Municipal Collection system failure Land development	1990-95 1997 1998	2.04 miles	Mobile River / Toulmins Spring Branch	2003
AL03160204-0504-101	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	2.04 miles	Mobile River / Toulmins Spring Branch	2008
AL03160204-0504-102	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Organic Enrichment/DO	Municipal Collection system failure Land development Urban runoff/storm sewers	1990-95 1997 1998	4.34 miles	Toulmins Spring Branch / Mobile Street	2003
AL03160204-0504-102	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	4.34 miles	Toulmins Spring Branch / Mobile Street	2008
AL03160204-0504-103	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Organic Enrichment/DO	Municipal Collection system failure Land development Urban runoff/storm sewers	1990-95 1997 1998	8.85 miles	Mobile Street / Its source	2003
AL03160204-0504-103	Threemile Creek	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	8.85 miles	Mobile Street / Its source	2003
AL03160204-0504-300	Toulmins Spring Branch	R	H	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2000-01	3.22 miles	Threemile Creek / Its source	2008

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Assessment Unit ID	Waterbody Name	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	Draft TMDL Date
AL03160204-0504-500	UT to Threemile Creek	R	H	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2000-01	1.04 miles	Threemile Creek / Its source	2008
AL03160204-0505-201	Tensaw River	R	H	Mobile	Baldwin	Fish & Wildlife	Metals (Hg)	Unknown source	2002	6.51 miles	Mobile Bay / Junction of Tensaw and Apalachee Rivers	2013
AL03160204-0505-202	Tensaw River	R	H	Mobile	Baldwin	Outstanding Alabama Water Swimming Fish & Wildlife	Metals (Hg)	Unknown source	2002	21.73 miles	Junction of Tensaw and Apalachee Rivers / Junction of Briar Lake	2013
AL03160204-0105-302	Tensaw River	R	H	Mobile	Baldwin	Outstanding Alabama Water Fish & Wildlife	Metals (Hg)	Unknown source	2002	2.93 miles	Junction of Briar Lake / Junction of Tensaw Lake	2013
AL03160204-0105-303	Tensaw River	R	H	Mobile	Baldwin Mobile	Fish & Wildlife	Metals (Hg)	Unknown source	2002	10.98 miles	Junction of Tensaw Lake / Mobile River	2013
AL03160205-0104-100	Mobile Bay	E	M	Mobile	Mobile	Shellfish Harvesting Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1994-97	170.60 sq. miles	Segment classified for shellfish harvesting	2008
AL03160205-0104-200	Bon Secour Bay	E	M	Mobile	Baldwin	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers Onsite wastewater systems	1994-97	103.84 sq. miles	Segment classified for shellfish harvesting	2008
AL03160205-0202-300	Bolton Branch	R	M	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	2.44 miles	Dog River / Its source	2008
AL03160205-0202-400	Eslava Creek	R	M	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	3.17 miles	Dog River / Its source	2008
AL03160205-0202-700	Bolton Branch	R	L	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Collection system failure	2003-05	5.69 miles	Moore Creek / Its source	2013
AL03160205-0205-100	Middle Fork Deer River	R	L	Mobile	Mobile	Fish & Wildlife	Organic enrichment/DO	Urban runoff/storm sewers Collection system failure	2003-05	3.51 miles	Mobile Bay / Its source	2013
AL03160205-0206-100	Fowl River	R	H	Mobile	Mobile	Swimming Fish & Wildlife	Metals (Hg)	Unknown source	2000	20.56 miles	Mobile Bay / Its source	2013
AL03160205-0306-200	Polecat Creek	R	L	Mobile	Baldwin	Swimming Fish & Wildlife	Metals (Hg)	Atmospheric Deposition	2005	7.89 miles	Fish River / Its source	2013
AL03160205-0306-500	Baker Branch	R	L	Mobile	Baldwin	Fish & Wildlife	Organic Enrichment/DO	Pasture grazing	2001	6.15 miles	Polecat Creek / Its source	2013
AL03160205-0307-102	Fish River	R	L	Mobile	Baldwin	Swimming Fish & Wildlife	Metals (Hg) Pathogens	Unknown source Pasture grazing	1996	30.01 miles	Weeks Bay / Its source	2013
AL03160205-0310-101	Bon Secour River	R	L	Mobile	Baldwin	Swimming Fish & Wildlife	Metals (Hg)	Atmospheric Deposition	2005	9.12 miles	Bon Secour Bay / One mile upstream from first bridge above its mouth	2013
AL03160205-0310-102	Bon Secour River	R	L	Mobile	Baldwin	Swimming Fish & Wildlife	Metals (Hg)	Atmospheric Deposition	2005	4.38 miles	One mile upstream from first bridge above its mouth / Its source	2013
AL03160205-0310-702	UT to Bon Secour River	R	H	Mobile	Baldwin	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Pasture grazing	1995	1.64 miles	Baldwin County Road 65 / Its source	2008
AL03160205-0311-100	Oyster Bay	E	L	Mobile	Baldwin	Shellfish Harvesting Fish & Wildlife	Pathogens	Unknown source	2003-2005	0.95 square miles	Oyster Bay	2013
AL-Gulf-of-Mexico	Gulf of Mexico	E	L	Mobile	Baldwin Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Metals (Hg)	Unknown source	1996-97	201.02 square miles	Mississippi / Florida	2013
AL03140103-0102-700	UT to Jackson Lake 2-S	R	H	Perdido-Escambia	Covington	Fish & Wildlife	Organic Enrichment/DO Pathogens	Pasture grazing Feedlots	1996-97	1.05 miles	W.F. Jackson Lake / Its source	2007
AL03140103-0102-800	UT to Jackson Lake 3-C	R	H	Perdido-Escambia	Covington	Fish & Wildlife	Organic Enrichment/DO Pathogens	Pasture grazing Feedlots	1996-97	1.77 miles	W.F. Jackson Lake / Its source	2007
AL03140103-0402-100	Yellow River	R	L	Perdido-Escambia	Covington	Fish & Wildlife	Metals (Hg)	Unknown source	2002	14.87 miles	AL-FL state line / North Creek	2011
AL03140104-0104-100	Blackwater River	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Hg)	Unknown source	2002	2.78 miles	AL-FL state line / Blackwater Creek	2011
AL03140106-0302-101	Brushy Creek	R	H	Perdido-Escambia	Escambia	Fish & Wildlife	Organic Enrichment/DO	Industrial Municipal Urban runoff/storm sewers	1999	0.22 miles	AL-FL state line / Boggy Branch	2007

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AL03140106-0302-101	Brushy Creek	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Pb)	Municipal Industrial	2004 2005	0.22 miles	AL-FL state line / Boggy Branch	2007
AL03140106-0302-201	Boggy Branch	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Pathogens Metals (Pb, Cu)	Municipal Industrial	2004	1.54 miles	Brushy Creek / Atmore WWTP	2007
AL03140106-0302-202	Boggy Branch	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Organic Enrichment/DO Metals (Zn) Chlorides	Industrial	1996 1997	0.22 miles	Atmore WWTP / Masland Carpets WWTP	2007
AL03140106-0302-202	Boggy Branch	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Ammonia	Municipal Industrial	2004 2005	0.22 miles	Atmore WWTP / Masland Carpets WWTP	2007
AL03140106-0502-100	Styx River	R	M	Perdido-Escambia	Baldwin	Swimming Fish & Wildlife	Metals (Hg)	Unknown source	2002	22.72 miles	Hollinger Creek / Its source	2011
AL03140106-0506-100	Styx River	R	M	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Hg)	Unknown source	2002	18.52 miles	Perdido River / Hollinger Creek	2011
AL03140106-0603-101	Blackwater River	R	L	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Hg)	Unknown source	2002	3.11 miles	Perdido River / Narrow Gap Creek	2011
AL03140106-0703-100	Perdido River	R	L	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Hg)	Atmospheric Deposition	2005	21.93 miles	Perdido Bay / Jacks Branch	2011
AL03140107-0103-100	Perdido Bay	E	L	Perdido-Escambia	Baldwin	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers Onsite wastewater systems	2001 2002	4.21 square miles	Lillian Bridge / Its source	2011
AL03140107-0205-100	Little Lagoon	E	L	Perdido-Escambia	Baldwin	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2000	3.96 square miles	In its entirety	2011
AL03140303-0302-101	Rocky Creek	R	H	Perdido-Escambia	Butler	Fish & Wildlife	Unknown toxicity	Unknown source	1986 1990	9.23 miles	Persimmon Creek / County Road north of Chapman	2007
AL03140304-0106-100	Conecuh River	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Hg)	Unknown source	2002	12.70 miles	AL-FL state line / Mantle Branch	2011
AL03140304-0605-100	Little Escambia Creek	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Hg)	Unknown source	2002	12.21 miles	AL-FL state line / Wild Fork Creek	2011
AL03140305-0301-100	Big Escambia Creek	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Hg)	Unknown source	2002	17.03 miles	AL-FL state line / Big Spring Creek	2011
AL03150110-0201-700	Pepperell Branch	R	H	Tallapoosa	Lee	Fish & Wildlife	Nutrients	Industrial	1988	6.67 miles	Sougahatchee Creek / Its source	2006
AL03150110-0204-101	Sougahatchee Creek (Yates Reservoir Embayment)	L	H	Tallapoosa	Tallapoosa	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Industrial Municipal Non- irrigated crop production Pasture grazing	1994-97	203.78 acres	Tallapoosa River / end of embayment	2006
AL03150110-0301-400	Moore's Mill Creek	R	L	Tallapoosa	Lee	Swimming Fish & Wildlife	Siltation	Land development Urban runoff/storm sewers	1998	10.51 miles	Chewacla Creek / Its source	2002
AL03150110-0504-101	Calebee Creek	R	H	Tallapoosa	Macon	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10.26 miles	Tallapoosa River / Macon County Road 9	2012
AL03150110-0703-100	Cubahatchee Creek	R	H	Tallapoosa	Macon	Swimming Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	22.07 miles	Tallapoosa River / Coon Hop Creek	2012
AL03150110-0702-102	Cubahatchee Creek	R	H	Tallapoosa	Macon Bullock	Swimming Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	22.37 miles	Coon Hop Creek / Its source	2012
AL03150110-0702-102	Cubahatchee Creek	R	L	Tallapoosa	Macon Bullock	Swimming Fish & Wildlife	Pathogens	Pasture Grazing	2000	22.37 miles	Coon Hop Creek / Its source	2012
AL03150110-0903-101	Line Creek	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10.29 miles	Tallapoosa River / Johnsons Creek	2012
AL03150110-0903-102	Line Creek	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation	Agriculture Surface mining	1996	5.51 miles	Johnsons Creek / Panther Creek	2012
AL06030001-0402-401	Warren Smith Creek	R	H	Tennessee	Jackson	Fish & Wildlife	Siltation	Surface mining-abandoned	1986 1987	1.96 miles	Dry Creek / Ross Branch	2010
AL06030002-0105-101	Guess Creek	R	H	Tennessee	Jackson	Fish & Wildlife	Unknown toxicity Organic Enrichment/DO Pathogens	Unknown source Pasture grazing	1997	11.08 miles	Paint Rock River / Bee Branch	2010
AL06030002-0304-100	Mountain Fork	R	H	Tennessee	Madison	Fish & Wildlife	Pathogens	Pasture grazing On-site wastewater systems	1994-95 1997	14.90 miles	Flint River / Its source	2006
AL06030002-0304-200	Hester Creek	R	M	Tennessee	Madison	Fish & Wildlife	Nutrients Pathogens	Pasture grazing	1994-95	7.27 miles	Mountain Fork / AL-TN state line	2006

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Greenhouse Gas Emissions and Emissions Trading/ Cap & Trade Plan:

Several agencies and local governments are addressing this critical topic. Articles and documents related to the reduction of GHG include:

- “Florida’s Energy and Climate Change Action Plan: 2007” (www.dep.state.fl.us/climatechange): On July 13, 2007, Governor Charlie Crist signed a groundbreaking set of Executive Orders during the recent Serve to Preserve Florida Summit on Global Climate Change that put into place a new direction for Florida’s energy future. The three Executive Orders represent the Governor’s commitment to addressing global climate change, a promise to reduce Florida’s greenhouse gases, increase our energy efficiency and pursue more renewable energy sources, such as solar and wind technologies, as well as alternative energy, such as ethanol and hydrogen. In addition, Governor Crist committed to partnering with Germany and the United Kingdom to discuss and promote initiatives that broaden the Kyoto Protocol and reduce the emission of greenhouse gases beyond 2012.
- “10 Steps to Reduce Greenhouse Gases Today” (www.kingcounty.gov): King County, Washington, has taken action against global warming by promoting the following ten steps that can cut greenhouse gas emissions by 25% in six months: 1) Know your carbon footprint; 2) Bus, bike or walk to your errands; 3) Change your commute times; 4) Make sure your next car is a “clean” one; 5) Lighten up (with alternative bulbs); 6) Plug in to the climate action community; 7) Buy locally; 8) Clean up your house (build green, use green cleaning supplies, etc.); 9) Let your friends, family and public officials know climate change is important to you; and 10) Change your thinking.
- “Needed: cap-and-trade plan”, 11/4/07 article in The Charlotte Observer (www.charlotte.com): According to Senator Elizabeth Dole, emissions generated by the electric power, manufacturing, and transportation sectors combined generate about 75% of the nation’s emissions. Sen. Dole has proposed the “America’s Climate Security Act” (ACSA), which sets emission allowances starting in 2012 through 2050 for specific sectors. Goal is to reduce total greenhouse gas emissions by 15% below the 2005 level in 2020, and by 70% below the 2005 level in 2050.
- “NY to cap and trade greenhouse gas”, 10/24/07 report on www.cleantech.com: Gov. Eliot Spitzer released draft regulations that would implement a cap and trade carbon credit system for power plants in the state. Annual CO₂ emissions from NY power plants will be capped at 64 million tons from 2009 until 2014, and the cap will be reduced by 2.5% per year until 2019. Goal is to cut 16% of greenhouse gas emissions in the state by 2019. Rules are part of the “Regional Greenhouse Gas Initiative” (RGGI) backed by 10 northeastern states.
- “Climate Pricing 101”, 9/21/07 article prepared by the Sightline Institute (www.sightline.org): There are three generally accepted methods to reduce greenhouse gas emissions: 1) Cap & Trade with Auctioning: The government sets a firm cap on total annual CO₂ emissions. Major emitters, such as utilities or refineries, must purchase credits for their emissions in regularly scheduled auctions. Emitters with low-cost reduction options have an incentive to reduce their emissions and sell any excess credits they may have purchased. On the other hand, emitters with higher-cost emissions reduction choices will buy additional credits rather than reducing their emissions; 2) Cap & Trade with Grandfathering: As with

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the auctioning system, above, the government sets a firm cap on total annual CO₂ emissions. In a grandfathering system the government then awards or allocates emissions credits for free to emitters based on their historical or expected emissions. The credits can be used by owner, or sold to other emitters. The financial incentives for trading credits works the same as in cap and auction, outlined above. (Note there is not necessarily a bright line between the auction and grandfathering flavors of cap and trade; many current proposals are a hybrid.); and 3) Carbon Tax: Government levies a fee on greenhouse gas emissions, based on the amount of CO₂, or equivalent, is emitted. The fee can be phased in, ratcheted up to improve effectiveness, or reduced as needed

- Travel Matters (www.travelmatters.org), a project of the The Center for Neighborhood Technology (CNT), indicates that 114 cities and counties participate in the International Council for Local Environmental Initiative (ICLEI)'s Cities for Climate Protection Program. Participants of this program must conduct a base-year emissions analysis of their greenhouse gas emissions; forecast emissions growth; adopt an emissions reduction target and an action plan outlining the proposed activities to achieve the emissions reduction target; implement the actions in their plan; and monitor and verify their emissions reductions.

Farm to Fuel Program:

In 2006, the Farm to Fuel Initiative was statutorily created to enhance the market for and promote the production and distribution of renewable energy from Florida-grown crops, agricultural wastes and residues, and other biomass, and to enhance the value of agriculture products and expand agribusiness in the State (www.floridafarmtofuel.com). This type of program should also be considered in Baldwin County with its vast amount of farm acreage and its mild climate.

Reduced Vehicle Miles Traveled (VMT):

The Victoria Transport Policy Institute (www.vtpi.org) studied 40 U.S. and European metropolitan areas, and concluded that substantial "VMT reductions are achievable with reductions in emissions and fuel use roughly proportionate to the decrease in VMT, while supporting the same level of future job and housing growth." Example data are:

- Maricopa County, Arizona: 3% VMT reduction in 20 years
- San Francisco Bay Area: 4.6% VMT reduction by 2020
- Baltimore Regional Transportation Board: 8.2% VMT reduction
- Portland, Oregon: 8.8% VMT reduction in 20 years
- Southern California Association of Governments: 10% VMT reduction in 25 years
- Denver Regional Council of Governments: 12.5% VMT reduction in 25 years
- Central Texas: 17% VMT reduction
- Contra Costa County, California: 17.3% VMT reduction in 20 years

Glossary of Terms:

- (a) Advance Identification – Federal planning process, authorized by the Clean Water Act, designed to locate, identify, and map wetland resources in a specific geographic area.

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Also, designed to provide detailed information on wetland functions in the designated area.

- (b) Anaerobic – Refers to an environment in which oxygen is lost. These environments are typical of wetland ecosystems.
- (c) Agricultural Uses – Activities within land areas which are predominantly used for the cultivation of crops and livestock, including cropland, pastureland, orchards, vineyards, nurseries, ornamental horticulture areas, groves, confined feeding operations, specialty farms, and silviculture areas.
- (d) Aquifer – A saturated, permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients.
- (e) Area Source – A pollution source which is insignificant individually, but which exists in large numbers and thus collectively impact air quality (e.g., automobiles).
- (f) Attainment – An official designation by the Environmental Protection Agency as being in compliance with the National Ambient Air Quality Standards.
- (g) Best Management Practices (BMPs) – Administrative rules which identify work practices and odor control equipment applicable to the terpene chemical manufacturing industry and which are reasonably available based upon considerations of costs and environmental benefits.
- (h) Biochemical Oxygen Demand (BOD) – A measure of the amount of dissolved oxygen required in biochemical process to oxidize waste in water.
- (i) Commercial Uses – Activities within land areas, which are predominantly connected with the sale, rental, and distribution of products, or performance of services.
- (j) Conservation – One of three wetland functional assessment categories reached by applying the RFWAM. Indicates that a wetland has high general functional capacity and that is suitable for preservation, protection, and, perhaps, maintenance.
- (k) Conservation Agreement – A legal contract between the landowner and the local government for conveyance of the conservation easement to Baldwin County or designated governmental agency. It discloses the terms of the conservation easement prior to recording it; it includes the identification of the parties involved, ownership information, easement area boundaries and associated legal descriptions, payment information, conservation practice obligations, and land title responsibilities.
- (l) Conservation Easement – A right or interest in real property, which is appropriate to retaining land or water areas predominantly in their natural state.
- (m) Conservation Uses – Activities within land areas designated for the purpose of conserving or protecting natural resources or environmental quality; and includes areas designated for such purposes as flood control, protection of quality or quantity of groundwater or surface water, floodplain management, fisheries management, or protection of vegetative communities, or wildlife habitats.
- (n) Critical Habitat – Refers to geographic locations which are vital to the survival of a Threatened and Endangered species as defined in the Endangered Species Act. The Specific areas on which are found those physical or biological features essential to the

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conservation of the species and which may require special management considerations or protection.

- (o) Depressional – One of 5 wetland classes described in the HGM wetland classification. These wetlands occur in topographic depressions and dominant water sources include precipitation, groundwater discharge, and both interflow and overland flow from adjacent uplands.
- (p) Development – The carrying out of any building activity or mining operation, the making of any material change in the use or appearance of any structure or land, or the dividing of land into three or more parcels.
- (q) The following activities or uses shall be taken for the purposes of this element to involve development, as defined herein:
- (r) A reconstruction, alteration of the size, or material change in the external appearance of a structure on land.
- (s) A change in the intensity of use of land, such as increase in the number of dwelling units in a structure or on land, or a material increase in the number of businesses, manufacturing establishments, offices, or dwelling units in a structure or on land.
- (t) Commencement of drilling, except to obtain soil samples, mining, or excavation on a parcel of land.
- (u) Demolition of a structure.
- (v) Clearing of land as an adjunct of construction.
- (w) Deposit or refuse, solid or liquid waste, or fill on a parcel of land.
- (x) The following operations or uses shall not be taken for the purpose of this element to involve development as defined herein:
- (y) Work by a highway or road agency or railroad company for the maintenance or improvement of a road or railroad
- (z) Work by any utility and other persons engaged in the distribution or transmission of gas or water for the purpose of inspecting, repairing, renewing, or constructing on established rights-of-way any sewers, mains, pipes, utility tunnels, power lines, towers, poles, tracks, or the like.
- (aa) The use of any structure or land devoted to dwelling uses for any purpose customarily incidental to enjoyment of the dwelling.
- (bb) The use of any land for the purpose of growing plants, crops, trees, and other agricultural or forestry products, raising livestock, or for other agricultural purposes.
- (cc) A change in use of land or structure from a use within a class specified in an ordinance or rule to another use in the same class.
- (dd) A change in the ownership or form of ownership of any parcel or structure.
- (ee) The creation or termination of rights of access, riparian rights, easements, covenants concerning development of land, or other rights of land.
- (ff) Enhancement – One of three wetland functional assessment categories reached by applying the RFWAM. Indicates that a wetland has a general functional capacity that is neither high nor low. Such a wetland may be suitable for manipulation of physical,

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- chemical, or biological characteristics to improve certain wetland functions while possibly allowing a decline in some other functions.
- (gg) Environmental Sensitive Areas – Areas of land including stream valleys, and their associated features; the habitats of species that are rare, threatened, and endangered; 100-year floodplains, and certain high priority forests.
 - (hh) Environmentally Sensitive Lands – Areas of land or water which are determined necessary by the local government, based on locally determined criteria, to conserve or protect natural habitats and ecological systems.
 - (ii) Estuarine – One of 5 wetland ecosystems described in the USFWS wetland classification scheme. This scheme consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to marine water, and in which marine water is at least occasionally diluted by freshwater run-off from the land.
 - (jj) Exceedance – A concentration of a pollutant at a level which is greater than the level allowed in the National Ambient Air Quality Standards.
 - (kk) Flat – One of 5 wetland classes described in the HGM wetland classification. These wetlands occur in areas where the main source of water is precipitation. They occur on areas with little or no topographic gradient and they depend partially on groundwater discharge.
 - (ll) Floodplains – Areas inundated during a 100-year flood event or identified by the National Flood Insurance Program, as an “A” or a “V” (Velocity) Zone on Flood Insurance Rate Maps, or Flood Hazard Boundary Maps. The part of a river valley that is made of unconsolidated, river-borne sediment and is periodically flooded. It is built up of relatively coarse debris left behind as a stream channel migrates laterally and of relatively fine sediment deposit when bankful discharge is exceeded.
 - (mm) Fringe – One of 5 wetland classes describe in the HGM wetland classification. These wetlands occur near a large body of water, most typically the ocean, and receive frequent and regular bidirectional flow from astronomic tides or wind-driven water level fluctuations. Other water sources may be riverine flow, groundwater discharge, and precipitation.
 - (nn) Function – Any ecological, hydrological, or other phenomenon that contributes to the self –maintenance of the wetland ecosystems; also, the normal or characteristic activities that take place in wetland ecosystems; or simply the things that wetlands do.
 - (oo) Groundwater – Water that occurs below the Earth’s surface. It is either passing through or standing in the soil and underlying strata, and is free to move under the influence of gravity. Most groundwater is derived from surface sources.
 - (pp) Hazardous Waste – Solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported disposed of, stored, treated or otherwise managed.

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- (qq) Historic Resources – All areas, districts, or sites containing properties listed on the Alabama Master Site File, the National Register of Historic Places, or designated by a local government as historically, architecturally, or archaeologically significant.
- (rr) Hydrogeomorphic (HGM) – Refers to a federal wetland classification scheme which identifies wetlands based on the following criteria: 1) geomorphology (i.e., a wetland's topographic position on the landscape), 2) hydrology (i.e., water source), and 3) hydrodynamics (i.e., the manner in which water moves through the wetland.)
- (ss) Industrial Uses – The activities within land areas predominantly connected with manufacturing, assembly, processing, or storage of products.
- (tt) Infrastructure – Those man-made structures which serve the common needs of the population, such as: sewage disposal systems, potable water systems, potable water wells serving a system, solid waste disposal sites or detention areas, storm water systems, utilities, piers, docks, wharves, breakwaters, bulkheads, seawalls, bulwarks, revetments, causeways, marinas, navigation channels, bridges, and roadways.
- (uu) Interdunal Swale – A wetland type located in a depressional area between two dune ridges. These wetlands commonly occur in the coastal portions of Baldwin County.
- (vv) Jurisdictional Wetland – Wetlands identified for regulation by the Clean Water Act. The 1987 United States Army Corps of Engineers Wetlands Delineation Manual is the tool used to determine jurisdictional status of a wetland. For a wetland to be jurisdictional, there must be at least one positive wetland indicator from each of the following criteria: 1) hydric soils 2) hydrophytic vegetation, and 3) wetland hydrology. Since the 2001 decision of the US Supreme Court, in SWANCC, isolated wetlands are not considered jurisdictional, whether or not they meet the criteria in the 1987 USACE Manual.
- (ww) Lacustrine – One of the 5 wetland systems described in the USFWS wetland classification scheme. This system includes all wetlands and deepwater habitats with all of the following characteristics: 1) situated on a topographic depression or a dammed river channel; 2) lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30% area coverage; and 3) total area exceeding 20 acres.
- (xx) Level of Service – An indicator of the extent or degree provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each public facility.
- (yy) Marine – One of the 5 wetland systems described in the USFWS wetland classification scheme. It consists of the open ocean overlaying the continental shelf and its associated high-energy coastline. These habitats are exposed to the waves and currents of the open ocean and the water regimes are determined primarily by the ebb and flow of oceanic tides.
- (zz) Mitigation Bank – The creation, restoration, or enhancement of an area of functioning wetland in advance of anticipated impacts within the same region.
- (aaa) Mitigation – The compensation for reduction or loss of wetland functions due to filling activities through wetland restoration, enhancement, and/or creation activities.

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- (bbb) Mobile Sources – Non-stationary sources of pollution including, but not limited to, automobiles, trucks, buses, trains, planes, boats, construction equipment, and agricultural equipment.
- (ccc) Non-attainment – An official designation by the Environmental Protection Agency as being in violation of the National Ambient Air Quality Standards.
- (ddd) Non-point Source Pollution – Any source of water that is not a point source.
- (eee) Objective – A specific, measureable, intermediate end that is achievable and marks progress toward a goal.
- (fff) Obstruction – Describes man-made barriers which prohibit or greatly reduce natural river flows and prevent overbank discharge of water into adjacent floodplains. Examples include dams, dikes, and roads.
- (ggg) Open Spaces – Undeveloped lands suitable for passive recreation or conservation uses.
- (hhh) Palustrine – One of the 5 wetland systems described in the USFWS wetland classification scheme. This system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per hundred.
- (iii) Photochemical – A chemical in the atmosphere which utilized energy from the sun its format.
- (jjj) Point Source Pollution – Any source of water pollution that constitutes a discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which pollutants are or may be discharged.
- (kkk) Policy – The way in which programs and activities are conducted to achieve an identified goal.
- (lll) Pollution – The presence in the outdoor atmosphere, ground, or water of any substances, contaminants, noise, manmade or man-induced alteration of the chemical, physical, biological, or radiological integrity of air or water, in quantities or at levels which are, or may be, potentially harmful or injurious to human health or welfare, animal or plant life, or unreasonably interfere with the enjoyment of life or property.
- (mmm) Riparian – Of, on, or relating to the banks of a natural course of water.
- (nnn) Riparian Buffer Zone – A belt of trees, shrubs, and grasses located adjacent to and “up-slope” from a body of water.
- (ooo) Riparian Corridor Area – An area including both the stream bank, buffer area, and an extended area of protection to prevent unnatural intrusions.
- (ppp) Riverine – One of 5 wetland classifications described in the HGM classification. These wetlands occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are overbank flow from the channel or subsurface hydrologic connections between the river channel and adjacent wetlands.
- (qqq) Shore or Shoreline – The interface of land and water.

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- (rrr) Special Management Area – A specific geographical area which, because of its unique or especially sensitive environment, requires special management techniques.
- (sss) Stationary Sources – Non-mobile commercial or industrial sources of pollution.
- (ttt) Stormwater – The flow water which results from a rainfall event.
- (uuu) Unclassified – An official designation by the Environmental Protection Agency as being unable to demonstrate compliance with the National Ambient Air Quality Standards, but not clearly in violation.
- (vvv) Violation – Pollutant concentrations which exceed the levels allowed and the frequencies allowed in the National Ambient Air Quality Standards.
- (www) Watershed – A geographic area from which a surface watercourse or groundwater system derives its water; the area of land where all precipitation drains to a common sink.
- (xxx) Water Table – The surface on which the fluid pressure in the pores of a porous medium is exactly atmospheric; the level below which the ground is completely saturated with water.
- (yyy) Wetland – Those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Public Input:

Citizens who attended the two Public Workshops (Sept. 25th and 26th, 2007) ranked their list of County issues and comments by order of importance at the end of the each evening. Below are the results for this element, listed in order of importance:

Conservation, Natural Resources and Open Space

1. Strengthen environmental regulatory controls, especially for wetland and watershed protection
2. Greenways and Blueways
3. Waterway and Water Quality Protection
4. Wetland Impacts and Watershed Mitigation
5. Acquire environmentally sensitive areas, waterfront property, and green space for public ownership
6. Distinguish between Conservation and Preservation
7. Stormwater Management Standards
8. Carbon Credits – Environmental Credits to Purchase Development Rights
9. Research options for land donation and environmental easements
10. Place more emphasis on environmental protection
11. Aquifer Recharge
12. Prevent Dumping in Un-Incorporated Areas
13. Coordinate with city Plans for Ecology Systems

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