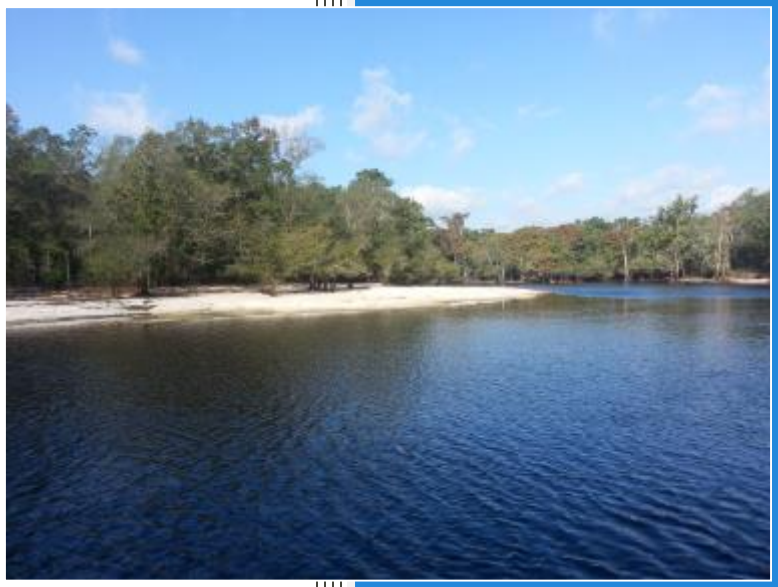
Natural Resources Element

Horry County Comprehensive Plan- Envision 2025



Horry County
SOUTH CAROLINA
Committed to Excellence

Horry County Planning and Zoning Department

Adopted March 3, 2015

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INTRODUCTION

Horry County is located along the northeastern coastal plain of South Carolina in an area known as the Grand Strand. While Horry County is renowned for its beaches and golf resorts, the majority of the county is characterized by its blackwater rivers, wetlands, forestlands, and farmland. Horry County's rich natural resources serve as the economic driver for our tourist industry, but they also provide a foundation for many residents' way of life. As more people continue to locate to and visit the Grand Strand, it will be more important than ever to ensure that development occurs in a manner that promotes a high quality of life while protecting and enhancing the unique natural characteristics of Horry County for existing and future generations.

This Element is intended to provide the mechanism for guiding natural resource conservation and development in a way that is compatible with the area's natural landscape. To do so, this document details the existing and changing conditions of the natural resources in the County. In addition, this document identifies the recreational assets that our natural resources provide, along with future recreational needs of our growing population. The goals and strategies defined in this document are essential to protect these resources and the benefits they provide. Critical to this preservation is the interconnectivity between quality of life and environmental health, as one without the other is virtually impossible. These goals, recommendations, and implementation strategies were reviewed and approved by the Horry County Parks and Open Space Board and Planning Commission, and were then approved by Horry County Council on March 3, 2015 by Ordinance 122-14.

BENEFITS OF NATURAL RESOURCES

The natural environment provides a variety of benefits for both wildlife and people. As development continues to spread throughout the County, there will be an increased threat to our natural resources. Protecting these natural assets not only ensures the future economic growth of our County, it also provides our residents with a high quality of life both today and into the future.

ENVIRONMENTAL FUNCTIONS

The natural environment provides many functions that not only sustain wildlife, but also provide many economic and recreational functions. The inherent benefits of natural resources include, but are not limited to:

- Water quality protection and enhancement by moderating surface runoff, recharging groundwater supplies, and trapping and removing sediments, nutrients, and chemical pollutants.
- Flood hazard reduction by reducing the velocity of flowing water, absorbing and slowly releasing floodwaters, thereby lowering flood peaks.
- Climate stabilization and moderation of weather extremes, such as floods and drought.
- Prime agricultural soils and pollination for the cultivation of crops, grazing of livestock, and harvesting of timber.
- Diverse fauna and landscapes that provide critical breeding, nesting, and feeding habitats for many species of mammals, waterfowl, reptiles, fish and shellfish species.
- Recreational opportunities for bird watchers, hunters, canoeists, anglers, and others.

ECONOMIC GROWTH

The natural environment has an immense impact on our local economy, as most vacationers visit Horry County to enjoy the beach and a variety of other recreational opportunities. While tourism is the main economic driver in Horry County, farming and forestry are an economic staple. Natural resources can also increase property values and even provide intangible services that would otherwise cost money, like water filtration and air purification.

Job Creation

The beach and the associated entertainment activities along the Grand Strand are the largest tourism draws and economic drivers in Horry County. Approximately 14 million people visit the Grand Strand each year. In 2011, tourism in Horry County accounted for 31.4 percent of the state's total domestic traveler spending (HC, 2012). In addition to leading all other SC counties in visitor spending, lodging rentals, employment and tax revenues, the County also accounts for forty percent of the state's second homes. While the beach and climate serve as the main tourist draw, there is an opportunity to expand tourist activities to include recreation and heritage tourism.

In 2011, $18 billion was spent on outdoor recreation in South Carolina, supporting 201,000 jobs, generating $4.7 billion in wages, and producing $1 billion in state and local tax revenue (OIA, 2012). The outdoor industry can continue to be an economic driver if our parks, beaches, waterways and trails are managed to sustain these natural and recreational assets.

Horry County's subtropical climate also makes it an ideal location for the cultivation of crops and timber. Agriculture and silvaculture are staple sectors of the County's and State's economy. In 2012, crop and livestock sales totaled $101.3 million in Horry County alone, a 54 percent increase since 2007. While agricultural sales are increasing, timber sales in 2011 reflected nearly a 38 percent decline since 2001, with only $19.5 million in sales. Because of the prime agricultural soils and climate, farming and timber production remain economic opportunities in Horry County. Additional information on the economic impact of tourism, agriculture and silvaculture can be found in the Economic Element of this plan.

Increased Property Values

Living near natural or recreational spaces has the potential to result in higher property values. For example, beachfront and other waterfront properties in Horry County are typically valued greater than other properties. In other portions of the country, properties adjacent to National Parks, forestlands, and greenway paths are also highly

valued. Higher property values are often associated with development that is (1) oriented towards open space rather than other development, (2) has limited vehicular access, but some recreational access, and (3) is effectively maintained and safe (NPS, 1995).

An increase in property values generally results in increased property tax revenues for local governments. Many arguments made for park and open space investment claim these projects pay for themselves in a short period of time, due in part to increased property tax revenues that they generate. Proximity to beaches, rivers, parks, greenways, and trails can increase sales price, increase the marketability of adjacent properties, and promote faster sales. Clustering development to protect and highlight a natural resource or recreational asset can even decrease overall development costs and result in greater profits for the developer.

Natural Capital

People derive many tangible goods from natural ecosystems that are important and familiar parts of the economy, such as seafood, game, and timber. What is less recognized is the natural ecosystems' performance of intangible life-support services, which are often taken for granted. Without these systems human civilizations would cease to thrive. They include: 1) the purification of air and water, 2) detoxification and decomposition of wastes, 3) regulation of climate, 4) regeneration of soil fertility, and 5) production and maintenance of biodiversity. Because most of the benefits of a healthy environment carry no price tags and cannot be bought and sold, changes in their supply and capacity may or may not be readily apparent. As development and resource consumption continues to increase, it is essential for local and global ecosystem services to be identified and monitored and that their value be incorporated into decision-making processes (Daily et al, 1997).

HEALTHY LIFESTYLES

The availability of parks and access to natural spaces has proven to have a positive influence on the physical and mental health of their users. Community design and the availability of open spaces and recreation areas strongly influence people's level of physical activity. Individuals that live in walkable communities spend more time doing physical activities than those that live in neighborhoods that are not walkable. In addition, living close to parks and other recreational facilities also consistently relates to higher activity levels for adults and youth, resulting in lower obesity rates (Robert Wood Johnson Foundation, 2010). Designing walkable communities with access to outdoor spaces is especially important to consider with future development, as the rates of obesity have risen dramatically since the 1970s. Providing access to recreation and natural spaces will assuredly have a positive influence of the physical health of our residents and those that vacation in our County.

Everybody needs beauty as well as bread, places to play in and pray in where nature may heal and cheer and give strength to the body and soul.
-- John Muir.

While there are many physical health benefits of living near and utilizing recreational assets, the mental health benefits of spending time in nature does not always require the same physical activity. Scenic views, such as the beach or waterways, are known to have restorative and mental health benefits (Lothian, 2010). For so many people, this is why they vacation at the beach and eventually retire here. Numerous studies document the positive impacts that recreation can have on mental health, from reducing depression and relieving stress, to improving quality of life in a variety of ways, to helping people to feel better about both their surroundings and themselves. Increased happiness and respect for the natural environment can also result in an increased sense of community pride.

REGULATORY MECHANISMS

There are a variety of laws and agencies from the federal to local level that regulate the use and management of natural resources. The Environmental Protection Agency (EPA) and the US Army Corps of Engineers (ACOE) are the federal agencies that establish environmental regulations, which are usually implemented at the state and local level, for instance the Clean Water Act and Clean Air Act. At the state level, there are a number of agencies that help implement federal policies and also have the right to adopt regulations beyond those established at the national level. The South Carolina Department of Health and Environmental Control (DHEC), the South Carolina Department of Natural Resources (DNR), and South Carolina Forestry Commission are the three main environmental protection and management agencies in the State.

At the local level, the Horry County Planning & Zoning Department and Stormwater Department are primarily responsible for implementing environmental protection through local regulations and enforcement. Locally, there are a number of ordinances and land development regulations which support the protection and management of natural resources. The Horry County Stormwater Department is charged with implementing federal and state water quality protection standards through our Stormwater Ordinance.

In addition, a number of environmentally focused planning documents have been adopted by Horry County Council, including the Horry County Comprehensive Beachfront Management Plan and the Horry County Parks and Open Space Plan. Additional planning documents, such as the Murrells Inlet Watershed Plan and the Waccamaw Region Section 208 Water Quality Management Plan were developed by the Waccamaw Regional Council of Governments and are being implemented regionally.

PARKS & OPEN SPACE BOARD

In 2000, Horry County Council established the Horry County Open Space Board by Ordinance 159-00. In 2004, it was reinstated as the Horry County Parks and Open Space Board (Ord. No. 115-00), and the ordinance was updated again in 2008 (Ord. No. 67-08). According to the Code of Ordinances, the purpose and objectives of this Board are:

- To promote the preservation of open space, scenic areas and vistas, greenways, squares, or village greens;
- To promote the protection and conservation of environmental or natural resources;
- To promote the expansion of quality open space for a wide range of recreational opportunities, including playgrounds, playfields, plazas, parks, mini-parks, picnic areas, bicycle or hiking trails, or golf courses for all county residents;
- To promote tourism emphasizing open space, recreational sites, and natural resources of Horry County;
- To promote education, awareness, and research relating to environmental and natural resources;
- To assist in coordinating activities with other local and regional organizations, businesses and governmental agencies active in the preservation of open space, recreational sites, and natural resources;
- To prepare and submit to the Horry County Council a parks and open space plan as a comprehensive guidance for areas of open space, significant environmental and natural resources, and recreational sites to be acquired, leased, preserved, protected, maintained, or developed through county funds, such as the Horry County Open Space Fund.

The Parks and Open Space Plan was adopted in 2008 and had two distinct objectives for green infrastructure in Horry County:

- Maintain and protect the ecological biodiversity and watershed function for the

health, safety, and future economic prosperity of Horry County

- Improve availability and access to improve the health and quality of life of all Horry County residents.

STORMWATER ADVISORY BOARD

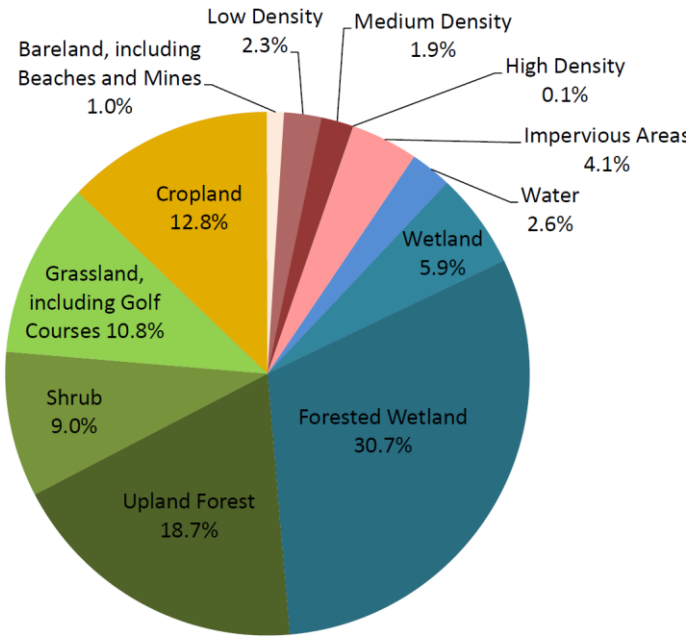
The Horry County Stormwater Advisory Board was established in 2000 to provide guidance and advice to County Council pertaining to the Stormwater Management Program. This includes the review of the Horry County Stormwater Ordinance, Stormwater Manual and specialized stormwater plans. In addition, this board promotes education, awareness, and research regarding stormwater best management practices to targeted audiences, including, but not limited to engineers, developers, HOAs, and property owners.

NATURAL RESOURCES INVENTORY

Horry County is situated in the coastal plain of South Carolina, in an area referred to as the Grand Strand. Unlike other coastal areas in the State, Horry County's beachfront is joined to the mainland and lacks barrier islands. Saltwater estuaries are only present in the most northern and southern portions of its coast. While Horry County is known for its beaches, the majority of Horry County is actually characterized by its blackwater rivers, forested wetlands, upland forests, and agricultural lands. A landcover map and table detailing the landcover distribution in Horry County can be found in **Appendix I, Map 1**.

This Natural Resources Inventory details the existing and changing conditions of the natural resources in Horry County. It is used to identify goals and implementation strategies that conserve, protect, and augment the enjoyment and beneficial use of our County's abundant natural and recreational resources.

Figure 1: Landcover Distribution in Horry County.



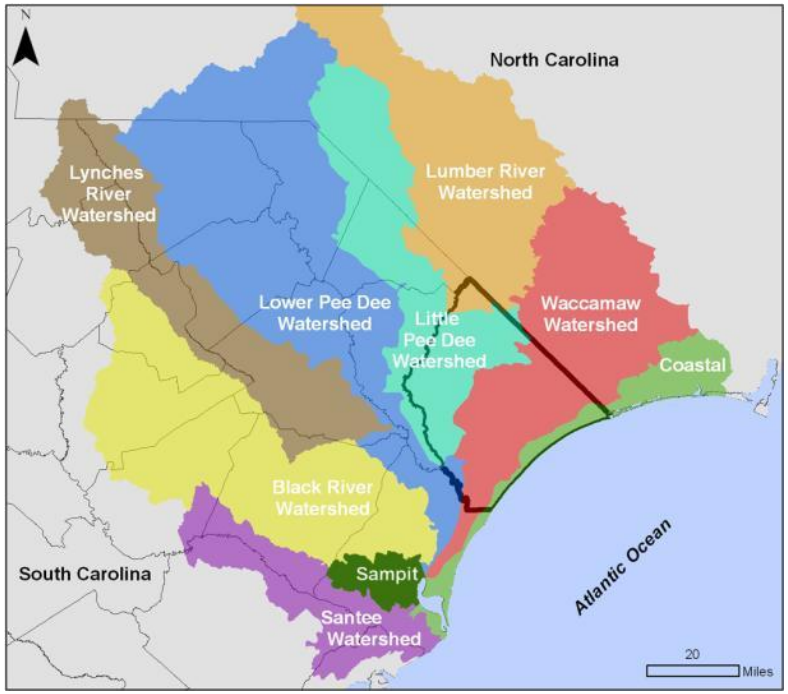
- Water - 29.4 sq miles
- Wetland- 67.28 sq miles
- Forested Wetland- 352.04 sq. miles
- Upland Forest- 214.31 sq. miles
- Shrub- 102.82 sq miles
- Grassland, including Golf Courses- 123.99 sq. miles
- Cropland- 146.63 sq. miles
- Bareland, including Beaches and Mines- 11.93 sq. miles
- Low Density Built Up- 26.37 sq. miles
- Medium Density Built Up- 22.21 sq. miles
- High Density Built Up- .59 sq. miles
- Impervious Areas- 47.39 sq. miles

Source: Horry County GIS, LULC, 2008.

WATERWAYS & WETLANDS

Horry County lies within the Pee Dee River Basin, which incorporates 45 watersheds and some 5.5 million acres within the State of South Carolina (a portion of the basin resides in North Carolina) (SCDHEC, Pee Dee, 2013). The watersheds in Horry County are dominated by the black waters of the Lumber, Little Pee Dee, Great Pee Dee and Waccamaw Rivers. These slow moving river systems flow through forested swamps where tannin rich, decaying vegetation stains the water dark brown, similar to the color of steeped tea. The natural resources of Horry County are largely defined by these major waterways, their tributary creeks and expansive floodplains.

Horry County's rivers serve as scenic resources for its residents and are a draw for outdoor recreational enthusiasts. The upper reaches of the Waccamaw, Little Pee Dee, and Lumber Rivers are covered in vegetation and are often impassible by motorized boats. Their sandy banks are enjoyed by boaters and campers alike. Further downstream, the rivers widen and merge into one another, the sandy banks disappear, and the waters begin to fluctuate on a tidal cycle as they near Winyah Bay. Eventually, these dark waters disperse into the Atlantic Ocean and darken the waters along our coast.



Map 1: Pee Dee River Basins. Source: Waccamaw Watershed Academy, Coastal Carolina University

State and National Recognition

In 1989, the South Carolina Rivers Act established the South Carolina Scenic Rivers Program to protect the natural and cultural heritage of South Carolina's rivers for the benefit and enjoyment of present and future generations. Natural and scenic rivers or river segments with "unique or outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic or cultural values" are selected to join this program. In 1990, fourteen miles of the Little Pee Dee River from Highway 378 to the confluence with the Great Pee Dee River was designated as a State Scenic River. In 2002, the governor signed a bill designating 70 miles of the Great Pee Dee as a Scenic River from the Highway 378 Bridge between Florence and Marion Counties to the Highway 17 Bridge at Winyah Bay. Landowners, community leaders, and South Carolina Department of Natural Resources staff are currently developing a management plan to address key environmental concerns and management practices to implement on lands bordering these scenic rivers.

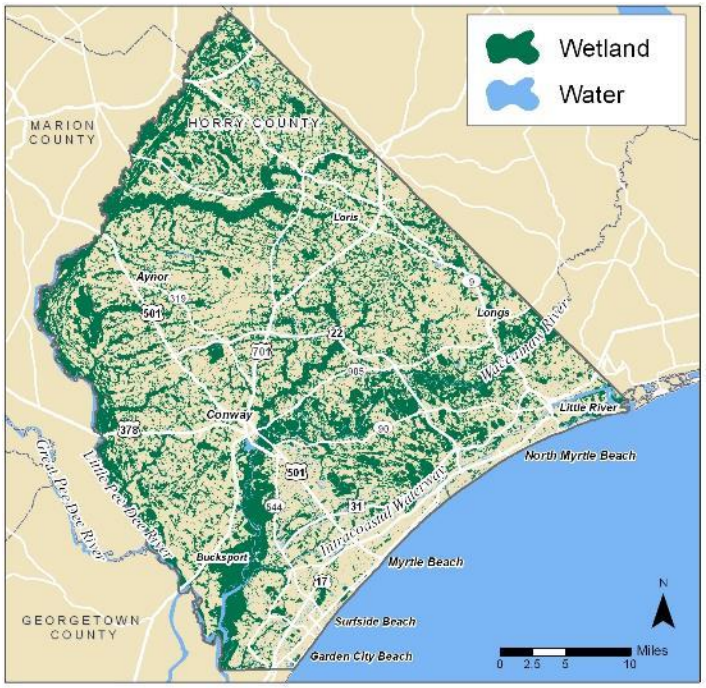
The Waccamaw River is another scenic waterway of historic and ecological importance. The Waccamaw extends 100 miles through the protected bottomland hardwood swamps of the Waccamaw Heritage Preserve and the Waccamaw National Wildlife Refuge. It also connects the City of Conway to the City of Georgetown. In 2009, it was designated as a National Water Trail by the National Parks Service because of its local and regional significance. The Waccamaw Blue Trail is drawing paddlers and wildlife enthusiasts to the area.

Photo 1: Kayakers enjoying the Waccamaw Blue Trail

Freshwater Wetlands

Wetlands make up approximately 37 percent of Horry County, with the majority being freshwater. Wetlands are defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (ACOE, 1987). Wetlands include swamps, marshes, and bogs, in addition to bottomland forests, Carolina Bays, pine savannahs, and even some ditches. A detailed wetland classification map can be found in **Appendix I, Map 2**.

Wetlands are federally protected by Section 404 of the Clean Water Act, which protects wetlands from being ditched, diked, filled, polluted, or altered in any other way without a permit from the US Army Corps of Engineers (ACOE). Silva culture practices and isolated wetlands are typically exempt from these federal requirements, although South Carolina's Pollution Control Act serves as a mechanism to protect isolated wetlands that are not within the Army Corps' jurisdiction. DHEC is the regulatory agency responsible for implementing this act. In addition, they are responsible for regulating wetlands in the coastal zone. Local governments also have the authority to establish regulations that exceed state and federal standards. Despite growing efforts to preserve wetlands, they continue to be lost at a rapid rate, both from direct conversion and degradation.



Map 2: Wetlands Classifications. Source: HC GIS, 2008.

Carolina Bays

Carolina Bays are elliptical-shaped, freshwater wetlands that are only found in the coastal plain of the eastern United States. They are oriented in a northwest-southeast direction, and their origin remains unknown. The Carolina Bay is sometimes called 'pocosin' which is the Indian word for "swamp on a hill." Many have raised sand rims and their interiors are rich with peat. The plants and animals that live in or around these wetlands are dependent upon their seasonal fluctuation in water levels. Many are also reliant upon fire for increased productivity.

Bays can range in size from less than one acre to more than 1,000 acres. According to a SCDNR report, Horry County has 410 Carolina Bays over 2 acres, which is more than any other county in the State (Bennett & Nelson, 1991). Unlike bays found in other counties, those in Horry County are typically small and often overlap one another. The Waccamaw River happens to be the only river in the world to originate and be fed by a Carolina Bay.

Photo 2: Lewis Ocean Bay Heritage Preserve

Carolina Bays have been heavily impacted by ditching, draining, or ponding for agricultural uses. Activities along the perimeter of these Bays, such as development and sand mining, can have an indirect impact on the biodiversity of these wetlands. Many animals, especially reptiles, are dependent upon these adjacent uplands for a portion of their lives, but these outer rims are not protected by Federal and State wetland regulations. Because Carolina Bays are considered a threatened ecosystem, SCDNR has incorporated Lewis Ocean Bay and Cartwheel Bay into their Heritage Preserve Program.

Surface Water Quality

Horry County's waterways are impacted by both source and nonpoint source pollution. Source pollution includes all of those known sources of pollution from wastewater facilities, which include discharges from industry, municipal storm sewer and waste water systems, and construction sites. There are 10 permitted wastewater pollution sources and two recently closed facilities in Horry County (WRCOG, 2011), but the majority of the water quality challenges in the County stem from nonpoint sources.

Nonpoint source (NPS) water pollution generally comes from numerous sources. Runoff occurring after a rain event may transport sediment from plowed fields, construction sites, or logging operations, pesticides and fertilizers from farms and lawns, motor oil and grease deposited on roads and parking lots, or bacteria containing waste from agricultural animal facilities, wildlife, domestic pet waste, malfunctioning septic systems or sanitary sewer system overflows. The rain moves the pollutants across the land to the nearest water body or storm drain where they may impact the water quality in creeks, rivers, lakes, estuaries and wetlands. Nonpoint source pollution may also impact groundwater when it is allowed to seep or percolate into aquifers.

Major impacts of poor water quality include physical destruction of aquatic habitat, fish die-offs, interference with or elimination of recreational uses of a water body, closure of shellfish beds and fish consumption advisories, reduced water supply or taste and odor problems in drinking water, potential human health problems due to contact with bacteria and chemicals in runoff, and increased potential for flooding because water bodies become choked with sediment.

Development intensity and impervious surfaces, such as roads and rooftops, tend to adversely impact water quality, as they reduce the natural infiltration of rainwater runoff. Studies have shown that water quality typically begins to decline as impervious cover reaches 10 percent of a

watershed. Once a watershed is more than 25 percent impervious cover, it almost assuredly is degraded (Schueler, 1992 and Holland and Sanger, 2008). Conversion of forestland into development is just one factor that contributes to water quality degradation. Drought and heavy rainfall also impacts water quality. During drought conditions and when water flows have decreased from upstream withdrawals, pollutants may become more concentrated on the landscape. During the next rainfall, this concentrated pollution is quickly transported off of the land to the nearest water body.

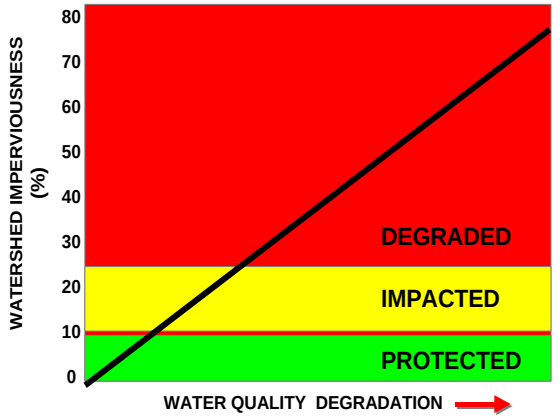


Figure 2: Relationship between Impervious Cover and Water Quality. Source: Schueler et al, 1992.

The Clean Water Act is the Federal law that establishes the regulatory structure for managing direct point-source discharges and non-point sources of pollutants into the waters of the United States. The Clean Water Act also establishes a framework for several non-regulatory tools to help address water quality concerns on a local, state, regional, and national level. The objective of this comprehensive legislation is to restore and maintain the overall quality of the nation's waters to ensure the "protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

At the state level, SCDHEC has established water classifications for each waterway based upon its use, and each classification has specific water quality standards that must be met in order to sustain that use. Water quality monitoring is done by SCDHEC on a variable basis depending upon the type of water use and monitoring. High levels of fecal coliform bacteria, enterococcus, mercury, or dissolved oxygen are typically indicators of poor water quality. After 3-5

consecutive years (depending on the type of monitoring) of poor water quality conditions, a waterbody will be listed on the *303 D List of Impaired Waterbodies* (see **Appendix II**). Local communities must implement best management practices to ensure that waterbodies meet the water quality standards. If waterbodies experience long-term contraventions of water quality standards, then SCDHEC must develop a Total Maximum Daily Load (TMDL) for that waterbody. A TMDL is the maximum load of a pollutant that can be assimilated by a waterbody without contravening water quality standards. A handful of TMDLs have been developed for impaired waterbodies in Horry County. In addition, the Waccamaw Regional Council of Government's recently adopted the *Waccamaw Region Section 208 Water Quality Management Plan* to address water quality concerns throughout the Waccamaw region.

Fish Consumption Advisories

Blackwater rivers are known to have naturally occurring mercury, which can be toxic to people, wildlife and the environment. While naturally found in our air, water and soil, mercury is also released into the environment through numerous human activities from industrial sources that burn coal to improper disposal of mercury-containing products, such as batteries and florescent light bulbs. As a result of these activities, mercury cycles through the environment polluting our air and water. These toxins build up in the tissue of many types of fish, which then build up in the larger fish we consume. High levels of mercury can prompt fish consumption advisories. Besides mercury, other contaminants, like polychlorinated biphenyls (PCBs) and radioisotopes can also prompt an advisory. A fish consumption advisory is a warning targeted to either the general population or specific at-risk groups such as babies, children under 14, women who are nursing, women who are pregnant and women who plan to become pregnant. Advisories tell you where you should limit the amount and specific type of fish you eat. A complete list of fish consumption advisories can be found in **Appendix II**.

Water Quality Education

At the local level, the Horry County Stormwater Department and Stormwater Advisory Committee play a strong role in protecting water quality. The Horry County Stormwater Department reviews all development plans and inspects major construction sites to ensure they are complying with federal, state, and local water quality protection measures. Horry County Stormwater also coordinates with the Coastal Waccamaw Stormwater Education Consortium (CWSEC) to help identify and address water quality concerns through research, community education, and water quality monitoring. The CWSEC is a regional organization that includes local governments in both Horry and Georgetown County. It also includes research institutions, educators, and advocacy organizations.

Coastal Carolina University's Center for Marine and Wetland Studies, the University of South Carolina's Baruch Institute for Marine and Coastal Sciences, and Clemson's Baruch Institute for Coastal Ecology and Forest Science all serve as valuable research partners that are engaged in identifying and researching water quality impairments. CCU's Waccamaw Watershed Academy, USC's North Inlet-Winyah Bay National Estuarine Research Reserve, and Clemson's Carolina Clear Program are also CWSEC partners, in addition to Murrells Inlet 2020, the Waccamaw Riverkeeper, and SC Sea Grant Consortium. Together, these organizations provide water quality education to a variety of groups and ages.

Photo 3: Low Impact Development training for local government staff and elected officials. Source: CWSEC.

COASTAL RESOURCES

The beach and coastal waters are perhaps the most recognizable and popular of all the natural resources in Horry County. The County is fortunate to have over 30 miles of sandy beaches and approximately 2,000 acres of salt marsh. Our beaches and marshes not only support wildlife habitat and recreation, they also serve as the primary draw for tourists and the influx of people moving to the area. Coastal resources are also significant aesthetic and educational assets for Horry County.

Separated by rivers and swamps from inland communities, the Grand Strand, was largely inaccessible until the turn of the century. In 1900, the Burroughs and Collins Company finished a railroad line to what is now Myrtle Beach. Access to the beach was further simplified in the following three decades with the erection of several bridges over the Waccamaw River and eventually access over the Intracoastal Waterway. Thus began the development of coastal Horry County.

Today, Horry County hosts more than 14 million visitors each year and accounts for nearly 35% of the total tourism revenues for the state of South Carolina. Much of the expenditure for recreation and tourism in the South Carolina coastal zone is for purposes of enjoying outdoor activities. While the economic viability of Horry County is dependent upon tourism, we must not forget that the tourism is dependent upon how we protect and maintain our coastal resources.

The South Carolina Office of Ocean and Coastal Resource Management (OCRM) is responsible for the protection and responsible development of South Carolina's coastal resources, including tidelands, beaches, and dunes. At the local level, Horry County and the municipalities within it are responsible for providing public access to these coastal resources. Local governments are also responsible for the development patterns and coastal construction, which can impact flooding, water quality, and a variety of other quality of life indicators.

Beaches

Horry County includes roughly 33 miles of ocean shoreline, of which, approximately 20 miles are part of the incorporated areas of Surfside Beach, Myrtle Beach, Briarcliffe Acres, Atlantic Beach and North Myrtle Beach. The Grand Strand is the longest continuous beachfront in South Carolina. It is only periodically interrupted by swashes, which are relic tidal inlets that have enclosed over time, both naturally and because of development.

Photo 4: Singleton Swash from Sands Dune Club. Credit: CCU, Center for Marine and Wetland Studies

The beaches in Horry County experience both erosion and accretion, which is often dependent upon seasonal weather patterns and the impacts of coastal storms. The County's beaches are maintained through beach renourishment, which is typically done every 7 to 9 years. The Grand Strand was last nourished in 2008. This project was completed in three phases, placing 2.9 million cubic yards of sand dredged from an offshore source along 26 miles of shoreline in North Myrtle Beach, Myrtle Beach, Surfside Beach, and Garden City (SCDHEC, 2009). While renourishment maintains the recreational use of the beach, it also sustains the habitat that is necessary for wildlife, such as migratory birds and sea turtles.

There are over 350 public beach access sites along the Grand Strand, 21 of which are maintained by Horry County (SCPRT, 1988). These access sites are critical to sustaining the local economy as they provide beach access for millions of beach goers each year. While high visitor use and intense development sustain our economy, it can impair the natural processes of the beach. In many areas of the Grand Strand,

there are no dune systems to be found. While dunes are important for habitat and protecting property and infrastructure from flood damage, many resorts were built with access to the beach being the greatest priority. Beach raking, which removes litter and smoothes the beach for the public's enjoyment, can also inhibit the ability of sand dunes to reestablish. Balancing the protection of dune systems with economic development can be a challenge. Such challenges and ways to overcome them are outlined within the Horry County Beach Management Plan, which was updated in 2013.

Salt Marshes

Tidal marshes are highly productive components of the marine food web of coastal waters and estuaries. Many commercially and recreationally important fish and shellfish species depend on these estuaries for all or part of their life cycle for foraging, refuge, and breeding. Marshes also perform a valuable waste treatment function, as dense vegetation filters and traps sediments and pollutants that enter as stormwater run-off from the upland areas. In addition, marsh and dune systems protect adjacent highlands from erosion and storm damage by absorbing and dissipating wave energy.

Photo 5: Little River Marsh View

Because Horry County does not have a barrier island or delta system, salt marshes can only be found in Murrells Inlet, directly behind Garden City Beach, and in the Cherry Grove and Little River communities. In these areas of the County, degrading water quality challenges the marshes ability to sustain consumable oysters, which could impact the local economy and deter the use of

these recreational waters. The Murrells Inlet Watershed Plan was recently developed to address water quality challenges and ways to improve water quality in both the Georgetown and Horry County portions of this watershed.

Intracoastal Waterway

The Intracoastal Waterway (ICW) is a 3,000 mile inland waterway that runs parallel to the Atlantic and Gulf coasts. Some sections of the waterway consist of natural inlets, saltwater rivers, bays and sounds, while others are artificial canals. While the Waccamaw River and Little River are natural portions of the ICW, the majority of the ICW in Horry County was constructed by the US Army Corps of Engineers (ACOE) in 1936. Over time, the waterway has become a part of the natural scenery. While the ICW in Horry County is tidally influenced, salt water only influences its northern reach in Little River. The remaining portion of the ICW in the Grand Strand is freshwater until it reaches Winyah Bay in Georgetown County. Along the freshwater portions of the ICW in Horry County, the artificial portion of the waterway mimics the blackwater rivers in the area.

Originally established to provide a safe transportation route and to protect commerce, the ICW now mainly serves as a route for transient boaters and other recreational users. Because the ICW is no longer primarily used for the transportation of goods, it is no longer regularly dredged to sustain its channel, potentially affecting its use for recreational boaters.

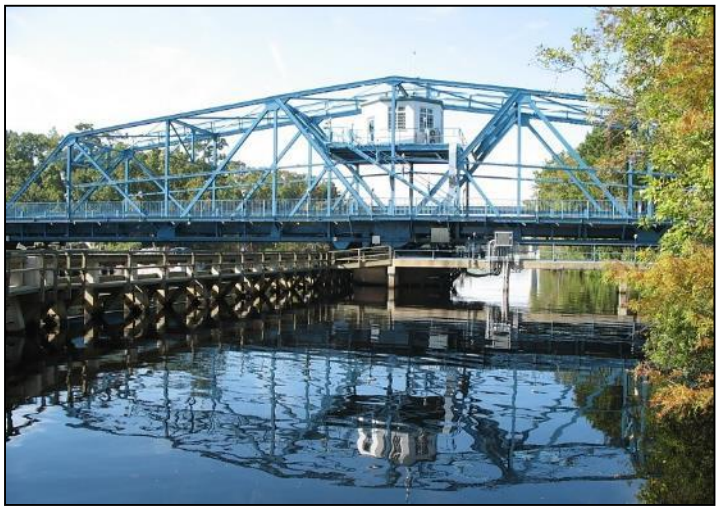
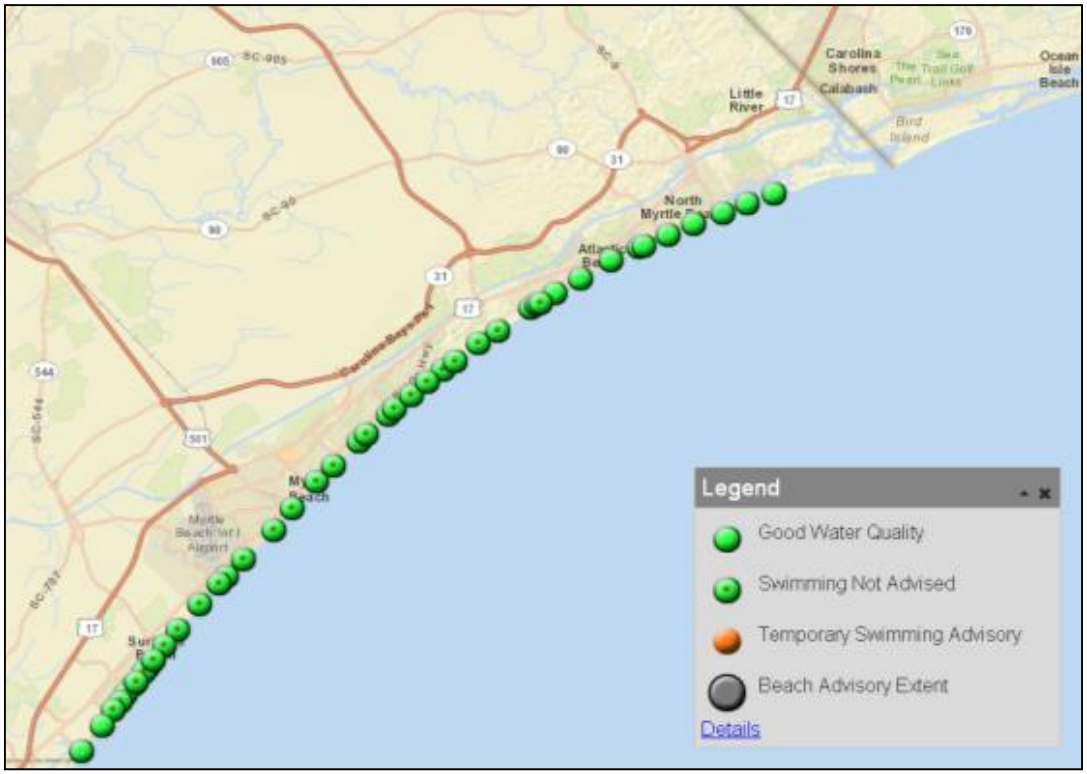


Photo 6: Socastee Swing Bridge over the Intracoastal Waterway

Coastal Water Quality

Protecting water quality along Horry County's coast is essential to ensure that our waters are safe for recreation and the consumption of fish and shellfish. Since the beginning of the Beach Water Quality monitoring program in 1997, SCDHEC has routinely collected water samples at over 40 locations on Horry County's beaches, many of which are located near swashes. Sampling occurs at least once per week between May 1 and October 1. The samples are tested for *Enterococci,* a fecal indicator bacteria. High enterococcus levels mean there is a greater chance of disease-causing organisms being present in the water, which triggers a swimming advisory for the portion of beach where the sample was taken. Of the 42 beach monitoring sites in Horry County, 23 have permanent swimming advisory signs posted because of the frequency that the advisories are issued. Horry County is the only coastal county in the state with permanent swimming advisories along its beaches.

Map 3: 2014 Swimming Advisories. Source: SCDHEC.



An advisory means that DHEC advises you NOT to swim within 200 feet of where these signs are posted, especially after a heavy rainfall. The concern is greatest for young children, those with compromised immune systems, and the elderly. Advisories do not mean that the beach is closed. Wading, fishing, and shell collecting do not typically pose a risk except after heavy rainfall events (SCDHEC, 2004).

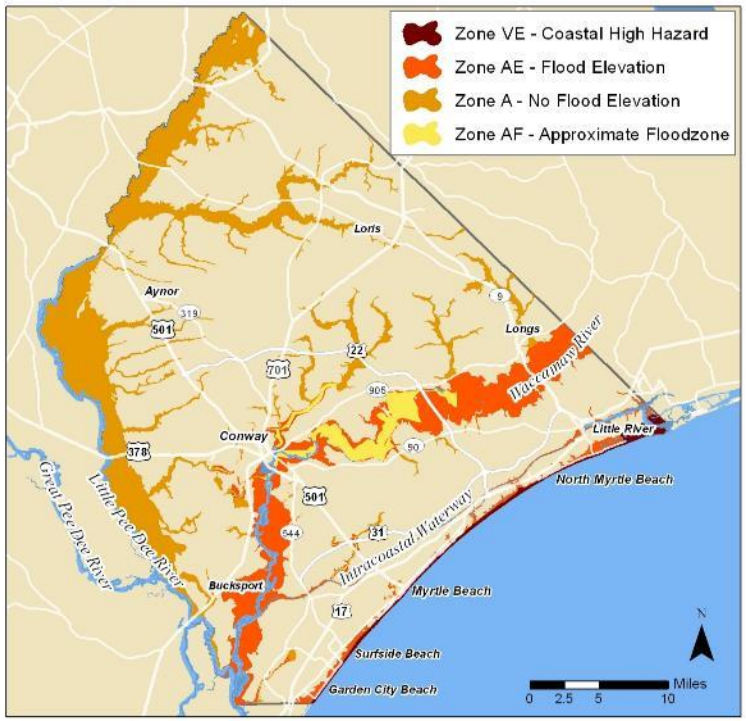
Numerous sites along the Grand Strand are presently identified on South Carolina's 303(d) list of impaired waterbodies for fecal indicator bacteria (see **Appendix II**). Under the requirements of the Clean Water Act, Total Maximum Daily Loads (TMDLs) will have to be developed and approved by the US Environmental Protection Agency (USEPA) for each of the 303(d)-listed sites.

Similarly, SCDHEC's Shellfish Sanitation Program samples tidal creeks for fecal coliform bacteria to ensure that mollusk and shellfish, and areas from which they are harvested, meet the health and environmental quality standards provided by Federal and State regulations for safe consumption. Shellfish harvesting is prohibited in Little River and is restricted near Waites Island, Cherry Grove, and Garden City. Harvesting is also restricted in the swashes (SCDHEC, Shellfish, 2013).

Floodplain

Approximately 24 percent of Horry County's total land area lies within the 100-year floodplain and is vulnerable to flooding. The floodzone primarily lies along the Waccamaw, Little Pee Dee and Lumber Rivers, where the water levels fluctuate with seasonal rain patterns. Major rain events, like tropical storms and hurricanes, and prolonged periods of rain have caused the greatest amount of flood damage in Horry County, trumping the impact of most storms that have impacted the beachfront. In 1999, Hurricane Floyd caused extensive inland flood damage, especially along the Waccamaw River, as rainfall persisted for multiple days. Many homes that experienced reoccurring flooding damage, otherwise known as repetitive losses properties, have been removed from these floodprone areas through funding

assistance from the Federal Emergency Management Agency (FEMA) and Horry County. Horry County continues to actively pursue flood mitigation efforts along the Waccamaw River.



Map 4: Floodzones. Source: Horry County GIS.

Less than one percent of the County falls within the coastal high hazard area, which includes those areas that could be impacted by wave action in addition to flooding. While the beachfront makes up very little of the County's floodplain, it constitutes a majority of the County's land values and tax base. Front row development along the unincorporated Horry County shoreline varies greatly in character and density. Of all the developed portions of the County's coastline, Garden City is most vulnerable to shallow coastal flooding and storm surge inundation. Its low-lying topography, lack of established dune systems, and the fact that it is affected by tidal action on both the beachfront and the marshfront make it especially susceptible to flooding. This is particularly true in the one mile reach north of Atlantic Avenue. Structures in this area tend to be large, and many encroach onto the active beach. The Shore Drive area between the City of Myrtle Beach and North Myrtle Beach also has large structures located seaward of the OCRM setback line; however, beach widths are greater there and erosion is not as rapid as it is in Garden City.

Fortunately, Horry County's beach communities have been spared by many large, intense hurricanes and tropical storms, with the exception of Hurricanes Hazel (1954) and Hurricane Hugo (1989). Hurricane Hazel was by far the strongest storm to impact the Grand Strand, but Hurricane Hugo (1989) caused more damage, as development was much more intense than in the 1950s and the impacts of the storm extended further inland. In Horry County alone, Hugo caused approximately $460 million in damage, primarily along the southern portion of the County.

Other coastal areas of the County that are extremely susceptible to flood damage and are significant habitats have been restricted from the use of federal flood insurance and other federal financial assistance, as they are part of the Coastal Barrier Resource System (CBRS). A total of 2,520 acres of the Horry County coast have been protected by disincentivizing development. While areas within the CBRS can be developed by private developers and property owners, the property owners are responsible for bearing the brunt of the costs in the event of a flood. In Horry County, there are just a few areas included within the CBRS, including the Meher Baba Spiritual Center, the maritime forest and beachfront of Briarcliffe Acres, the inlet at White Point Swash, and Waites Island. While Waites Island has been partly set aside as conserved land through Coastal Carolina University, a large portion of the island remains in private ownership and could be developed through private lenders. This island not only serves as an example of a pristine natural area, it also serves as the gateway to the South Carolina portion of the Intracoastal Waterway.

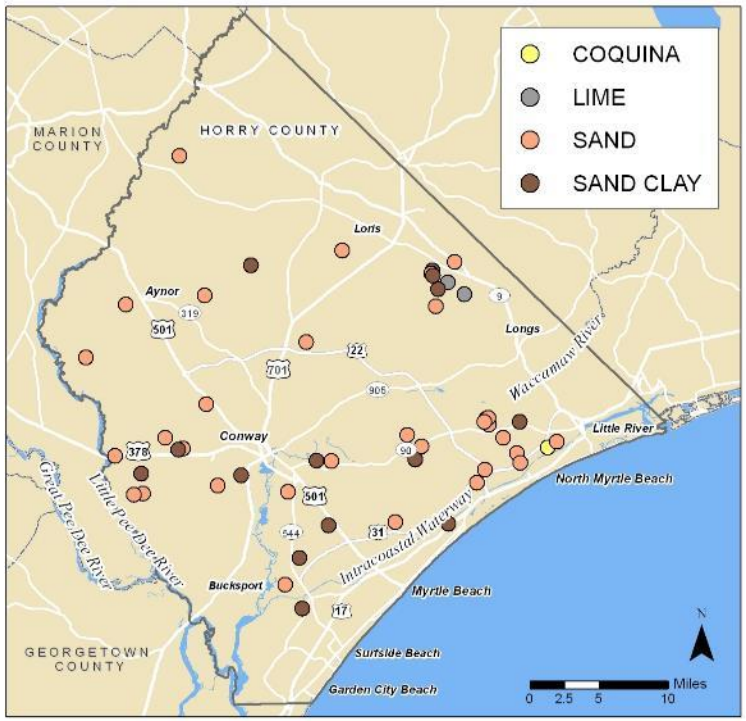
Conserving land in the floodplain is important both along the coast and along inland waterways. Undeveloped, forested land provides an area to slow down and absorb floodwaters. Dune systems and wetlands also serve as protection against floodwaters. By protecting these natural assets, Horry County can simultaneously protect its citizens, private property, and its tax base.

SOILS

Horry's coastal character can be seen throughout the County, as sandy soils and relic sand dunes can even be found inland and along the Lumber, Little Pee Dee and Waccamaw Rivers. Coquina and limestone resources can also be found throughout the entire Pee Dee Region. While relatively flat, Horry County's highest elevations reach over 110 feet above sea level along the sand ridges of Carolina Bays (HC GIS, 2008). While Horry County's flat topography presents few development constraints, poor soil drainage can serve as a challenge for developers and property owners due to the possibility of flooding.

Mining

Horry County's coastal geology makes it a suitable location to mine sand, coquina, and limestone. There are several types of surface mining done in South Carolina, including open pit, strip mines, and sand dredging from river bottoms. The SC Mining Act of 1974 defines mining as the removal of ores from the ground for sale or for use in a business. The Act and regulations outline the application process, how to conduct mine operations, and minimum reclamation standards. Mine permits and certificates are issued through DHEC's Division of Mining and Solid Waste Management.



Map 5: SCDHEC Permitted Mining Operations

There are 49 SCDHEC permitted mines in the County (SCDHEC, 2013). The material coming out

of these mines is primarily used for road construction and development projects. Borrow pits operated by or for the SC Department of Transportation (SCDOT) are exempt from mining permits if the material is used solely for the building or repair of South Carolina public roads. Practices such as farming and on-site construction are also exempt from mining permits from SCDHEC.

In 2006, Horry County Council began permitting new mining operations as conditional uses in Forest Agriculture or Commercial Forest Agricultural zoning classifications. Ponds less than two acres in size and farm ponds less than five acres do not require mining permits from SCDHEC or from Horry County Council. All stormwater ponds if they are associated with an approved development are exempt from obtaining a mining permit from County Council and SCDHEC.

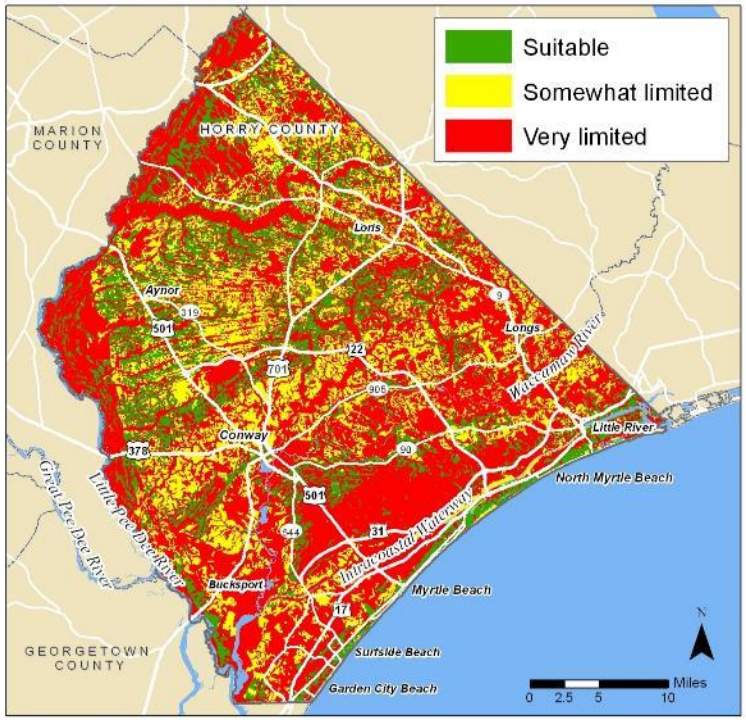
Drainage

According to the USDA Natural Resource Conservation Service's Soil Survey, the majority of soils in Horry County are loamy sand and sandy loam with generally poor drainage characteristics. Approximately 43 percent of the soils in Horry County have high to medium run-off potential and, thus, poor drainage capacity and a slow infiltration rate. These areas are found throughout the County but are concentrated near major rivers and streams. Poor drainage areas often coincide with wetland and floodplain areas and are typically classified as hydric soils. Areas with the best infiltration occur near the beach because the sandy soils have a higher infiltration rate and better drainage capacity.

Photo 7: Highly drained to poorly drained, hydric soils. Source: USACE.

Septic Suitability

Approximately 88 percent of Horry County has severe limitations for septic tank absorption fields. The soil absorption field provides the final treatment and distribution of the wastewater of a septic system. To treat wastewater, a septic system relies heavily on the microorganisms in the soil to help remove the organic matter, solids and nutrients left in the water (Lesikar, B., 2008). It is also dependent upon soil drainage. Areas less suitable for septic tanks usually require special design, significant increases in construction costs, and increased maintenance. In many cases, installing or connecting to a sewer line is a more viable and environmentally conscious choice, although it is more costly for a single homeowner or developer. In addition, expanding sewer lines into rural areas can encourage development in places in areas of the County that are more suitable for agriculture, forest land, and conservation and outdoor recreation.



Map 6: Septic Suitability

AGRICULTURE

Agricultural lands are a key component of Horry County's landscape, history, and economy. Agricultural lands compromise about 22 percent of the land in the County.

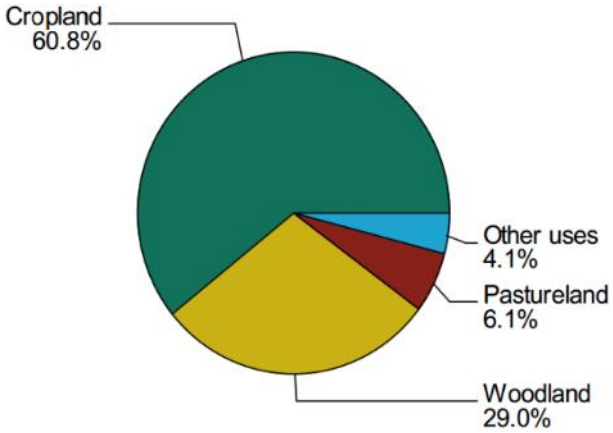


Figure 3: Land in Farms by Type of Land (USDA, 2012)

In 2012, there were 938 farms, including lands for crops, pasture and grazing, and woodlands (USDA, 2012). Between 2002 and 2012, there was a 5 percent decrease in the number of farms in the County, along with a decrease in farm acreage and average farm size. While these numbers indicate little change in agriculture during the last decade, agricultural lands and the number of farms decreased from 2002-2007. This loss of farmland coincides with development increases in Horry County.

Table 1: Farmland Trends in Horry County (USDA, 2012).

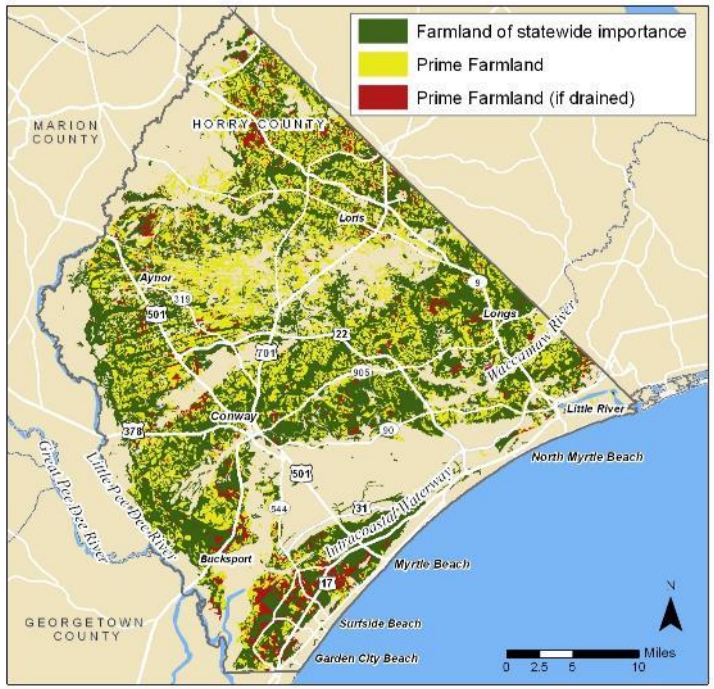
	2002	2007	2012
Number of Farms	988	914	938
Acres in Farms	188,311	163,622	177,569
Average Farm Size	191	179	189

Since 2007, these numbers have nearly recovered and agricultural sales have seen a sharp incline. In 2012 alone, Horry County generated over $101 million crop and livestock sales. Despite the loss of farmland, agriculture continues to have a strong impact on our local economy. More information on the economic impact of agriculture in Horry County can be found in the Economic Element of this plan.

Cropland

Prime agricultural soils are abundant throughout Horry County, covering over 60 percent of the County's total land area. While much of the County is viable for crop production, only 12.8

percent is currently in use. These croplands account for two-thirds of all agricultural revenue in Horry County.



Map 7: Prime Agricultural Farmland (USGS, NRCS)

Until recently, tobacco served as the largest revenue generating crop in Horry County. While Horry County remains the number one producer of tobacco in the state (USDA, 2012), many farmers are diversifying or transitioning into growing other crops, such as peanuts or sweet potatoes (Hughes, 2013). The most abundantly grown crops grown in Horry County today include soybeans, corn and wheat for grain and foraging, and peanuts (USDA, 2012). Cotton production and yield also increased markedly from 2007 to 2012 (USDA, 2012).

Horry County lags behind the State and region in fruit, vegetables, melons, berries, and nuts. However, given the increase in the number of area farmers markets, the local food movement occurring nationwide, and the decrease in farm sizes, fruit and vegetable farming could be an opportunity for Horry County (Hughes, 2013).

Poultry and Livestock

Poultry and livestock generated over $21 million in sales in 2012. Despite the fact that sales revenues have remained relatively the same since 2007, poultry and livestock inventories continue to decrease in Horry County. From 2007 to 2012, the sale of poultry and eggs decreased from nearly $11 million to $5.5 million and the inventory of

broilers decreased by more than 360,000. During this same timeframe, the number of hogs decreased from 42,000 to 34,000, but sales increased over $3 million, exceeding $12 million in 2012. Horry County continues to serve as the number two producer of hogs in the State (USDA, 2012). Horry County likely has a larger concentration of hogs and pigs than other South Carolina counties because of access to swine slaughtering facilities in southeastern North Carolina (Hughes, 2013). Other livestock revenue is derived from the sale of cattle, horses, and goats (USDA, 2012). The number and sale of horses and ponies has slightly increased since 2007. Because Horry County is such a large tourist destination and there is no other type of facility in the region, Horry County would be a prime location for a livestock and equestrian arena. Such a facility could help foster this agricultural sector.

Farmland Preservation

Often, lands that are most at risk for development are farmlands and timberlands. As farmers age and farming becomes less economically viable for them, many are opting to sell their land for development rather than continuing to farm. When this happens, social benefits such as flood control, groundwater recharge and wildlife habitat are replaced by the social costs of infrastructure such as schools, police and emergency services.

In 2011, Horry County developed the Highway *319 Area Plan* to protect the rural and agricultural heritage of the corridor between Conway and Aynor. Rural communities throughout the County are being encroached upon by new development, potentially threatening the agricultural heritage of the County. Targeted agricultural preservation is one means to minimize the subdivision and sale of farmland for large scale, residential development.

Farmers can participate in several State and Federal programs that can help protect the cultural heritage and ecological benefits derived from farming. One such program is the Farm and Ranch Lands Protection Program, which is

managed by the USDA. Through this program and upon the request of the property owner, the USDA can purchase conservation easements on productive farm and ranch land. Farmers receive financial assistance in exchange for preserving their farmland and protecting the habitat, wetlands and streams on their property. In exchange for utilizing best management practices, farmers can improve their economic situation and simultaneously protect the environment. In Horry County, the Farm and Ranch Land Protection Program has eight properties enrolled, permanently conserving over 825 acres of land (SC Conservation Bank, 2014). The Pee Dee Land Trust also supports agricultural preservation in the Pee Dee region, and has preserved two tracts in Horry County, totaling 306 acres (PDLT, 2014).

Century Farms

Another way to preserve farmland is through the Century Farms Program. The Century Farms Program was established in 1974 to honor families whose farmland has been under the same ownership for 100 or more years. In most cases, property boundaries and size have changed over the years, but if a portion of the original farm still remains intact and under the same family ownership, it can be eligible for a Century Farm designation. Approved Century Farms applicants receive a yard plaque and a certificate designating their property as a "Century Farm in Historic South Carolina."

While a Century Farms designation does not formally protect farmland from being converted to development, often times those interested in recognizing their family's heritage are also interested in preserving the land. Many of these properties are also eligible to be on the Horry County Historic Property Register. As of 2013, there were ten Century Farms designated in Horry County, including: Stevens Farm, Horace Hammond Farm, Ralph Hammond Farm, Bellamy Farms, McNeil Farm, Martin-Edwards Farm, Waller Farm, Worley Farm, Vereen Farm, and H.G. Bullock Farm. There remains a potential for many more historic farms to be designated in the future. By preserving and recognizing the value of

agricultural lands in Horry County, we are also preserving our agricultural heritage.

Photo 8: Worley Farm

Agricultural Education

Teaching the public and future generations about the current and historical farming practices has the potential to foster future generations of farmers in Horry County. There are two facilities that currently offer agriculture education programs and special events.

The **LW Paul Living History Farm** is a 17 acre, Horry County Museum facility that educates future generations about traditional farming life in the first half of the twentieth century. Visitors to the Farm will have the opportunity to sample the everyday life of an Horry County farm family living during this era. Guests on this working farm will be able to observe and participate in activities that would have been commonplace on traditional family farms. Plowing with mules, making lye soap, grinding grits, blacksmithing, curing meat, preserving vegetables, milking cows, and harvesting crops are only a few hands on activities the Farm plans to offer. Events at the Farm change seasonally.

Freewoods Farm is located in the Burgess Community and plays tribute to African American Farming immediately following the end of the Civil War. Freewoods is a 40-acre living farm museum replicating life on small southern family farms owned and/or operated by African Americans between 1865 – 1900. Freewoods Farm provides educational and tourism opportunities for locals and visitors to the area.

FORESTLAND

Approximately 50 percent of the County's total land area is classified as forestland, with 30.7 percent considered forested wetlands and 18.7 percent as upland forests. Nearly all of the upland forests are comprised of evergreens, while bald cypress and water tupelo trees are located along the floodplains of our waterways and within Carolina Bays. Forestlands are valuable natural resources and, if properly managed, provide an excellent sample of sustainable development practices. Some of the values forestlands provide are:

- Environmental quality by controlling noise, abating winds, filtering air, preventing soil erosion, and protecting water quality.
- Habitat for a variety of wildlife, including both game and non-game species.
- Outdoor recreational opportunities and enjoyment of scenic beauty through camping, hiking, picnicking, hunting, and bird watching.
- Job creation and the production of more than 5,000 types of products.

Timber Harvesting

Timber and milling operations have a long history in Horry County, as ship building and forestry were the primary economic drivers in Horry County during the 1800s. Long-leaf pine was nearly depleted by the early 1900s in Horry County and throughout the Southeast, and with the loss of the resource, many companies relocated to areas where long-leaf pines were still available (Horry County Historical Society). For those that remained, forests were typically replenished with loblolly, slash, and short leaf pine. These varieties of pine mature faster than longleaf, but the quality of their wood limits their use to paper production and lumber.

While there is a great deal of forestland in Horry County, Canfor serves as the County's only lumber mill. There are also a few portable or custom sawmills in the County that are available to produce rough cut lumber on site (SCFC, 2014). A large majority of timber is harvested for pulp and typically transported to International Paper in Georgetown.

Wildfires

The SC Forestry Commission fights more than 2,000 wildfires in the State each year. On average, Horry County has approximately 242 wildfires that damage over 1,700 acres annually. In 2009, the Highway 31 Fire, also known as the Barefoot Fire, burned over 19,000 acres, destroyed 76 homes, and damaged another 97, resulting in over $50 million in damages.

Photo 9: Hwy 31 Fire, 2009. Credit: SCFC

While wildfires have historically occurred in Horry County, it was not until recently that homes, infrastructure, and people were in harm's way. Increased development alongside large forested tracts of land hinders the ability for land managers to conduct controlled burns to reduce wildfire fuels, thus increasing the likelihood of larger, more intense wildfires. In addition, the close proximity of residential development to forested lands increases the likelihood of residents accidentally starting a wildfire by using fireworks, burning debris or bonfires, or other activities.

SCFC employees work with local fire departments to assess the potential for wildfire damage to communities and individual homes. As part of the National Fire Plan effort, SCFC personnel also have been conducting workshops to educate community leaders and homeowners in high fire risk communities throughout the state (SC Forestry Commission, Wildland-Urban Interface Fire Prevention). There are steps that the County can take to reduce wildfire risks to homeowners, including requiring developers to include defensible space into developments bordering a dense forested tract. Defensible space is an area around a structure where fuels and vegetation are

treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to the surrounding forest (Dennis, 2003).

Figure 4: Example of Defensible Space. Source: NFPA

Additionally, SCFC continues to work with homeowners associations to help them understand ways to reduce fuels in their own neighborhoods and in their own yards. So far, nine communities in Horry County have achieved a Firewise designation through the assistance of SCFC and the Horry County Wildfire Team. Many more communities are seeking this designation to reduce their vulnerability to wildfires.

Urban Forestry

There are numerous benefits to providing urban and suburban green spaces, community forests, and streetscapes within neighborhoods and commercial areas, including:

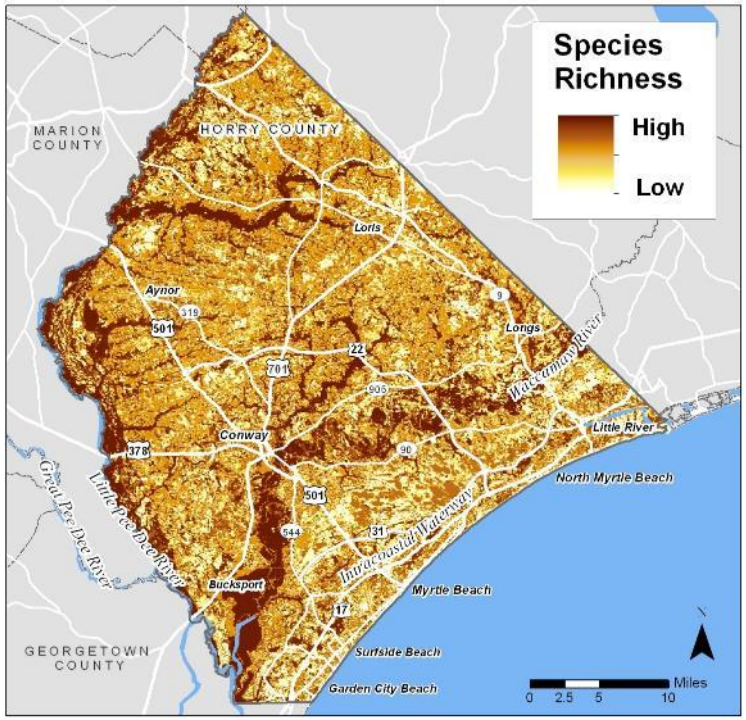
- Habitat for urban wildlife
- Reduced heating and cooling costs
- Interception and storage of rainwater
- Improved air quality
- Sound buffer, and
- Increased property values.

Trees also release water to the atmosphere providing an important pathway for removal of stormwater from the land, even reducing flooding. As development increases in Horry County, natural tree coverage and vegetation will inevitably be lost. Because of the many benefits that trees provide, Horry County has measures in place to protect mature trees, including a Tree Preservation and Landscape Buffer Ordinance.

SPECIES HABITAT

Horry County's diverse landscape supports a variety of plant and animal species. In many cases, the rich biodiversity found throughout the county can be directly associated with the abundance of water resources, from beaches and tidal marshes to forested wetlands and Carolina Bays. Biodiversity is a sign of a healthy ecosystem, as it supports ecosystem productivity and ensures the greater capability to withstand and recover from disasters.

According to South Carolina Department of Natural Resources, the land along the Lumber, Little Pee Dee, and Waccamaw Rivers have the potential to support the greatest variety of species in the County, as seen in the Species Richness Map (SCDNR, 2001). While this map does not reflect the actual numbers of animals or their abundance in a given area, it does indicate where the greatest biodiversity of plant and animal species is likely to be found; therefore, indicating the areas with the greatest need for land and habitat protection.



Map 8: Species Richness. SCDNR 2001.

Conservation Land

There are numerous Federal, State, and non-profit organizations involved in conserving the unique habitats and wildlife corridors in Horry County, including, but not limited to, the US Fish and Wildlife Service, USDA Natural Resources Conservation Service, the SC Department of Natural Resources,

the Nature Conservancy, Ducks Unlimited, & the Pee Dee Land Trust. Additional entities, such as the Waccamaw Riverkeeper, American Rivers, and the Coastal Conservation League are also partners involved in identifying local conservation priorities.

In 2009, Horry County Council adopted the Horry County Parks and Open Space Plan to identify priority conservation areas based upon the location of existing conservation lands, wetlands and floodplains, and critical habitat corridors. See **Appendix I, Map 4** to view these priority conservation areas. The priority areas not only identifies sites to expand existing conservation corridors, it also identifies opportunities to connect existing recreational amenities to these natural lands and waterways. The following details some of the existing conservation lands in Horry County.

Waccamaw National Wildlife Refuge

The U.S. Fish and Wildlife Service (USFWS) established the Waccamaw National Wildlife Refuge (NWR) in December 1997. The refuge was established to protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of endangered and threatened species, freshwater and anadromous fish, migratory birds, and forest wildlife. The Refuge includes a wide array of plants and animals associated with bottomland hardwood habitats and provides compatible wildlife-dependent recreational activities, including hunting, fishing, wildlife observation, photography, and environmental education and interpretation.

Located in portions of Horry, Georgetown, and Marion County, the Waccamaw NWR acquisition boundary spans over 55,000 acres and includes large sections of the Waccamaw and Great Pee Dee Rivers and a small section of the Little Pee Dee River. The USFWS is actively acquiring lands within this acquisition boundary from willing sellers and has acquired 27,000 acres thus far (USFW, 2013).

Photo 10: Swallow-Tailed Kite at the Waccamaw National Wildlife Refuge. Credit: Craig Sasser

SC DNR Heritage Trust Preserves

The South Carolina Department of Natural Resources' Heritage Trust Program was created in 1976 to preserve those natural features and cultural remains, which are quickly disappearing as the State's population increases in size. The program's purpose is to identify, evaluate, and protect the elements considered the most outstanding representatives of the State's heritage. There are currently four heritage preserves in Horry County. (SCDNR, 2014).

Waccamaw River Heritage Preserve – This preserve is 5,347 acres, which includes 30 miles of protected river wetlands and bottomland hardwood forests. The property contains the best examples of rare plant species, including the dwarf fimbry. It also supports habitats for four other threatened plant species and contains mature hardwood forest.

Cartwheel Bay Heritage Preserve – This 568 acre preserve protects one of the few known Carolina bay-longleaf pine savannah complexes in South Carolina. The longleaf pine savannahs contain white fringed, yellow fringed and rosebud orchids, venus' fly traps, pitcher plants and a diverse array of wildflowers.

Lewis Ocean Bay Heritage Preserve – This 10,444 acre preserve contains a group of 23 Carolina Bays. This preserve includes habitats for black bear, the endangered red-cockaded woodpecker, the threatened Venus flytrap and a pond pine pocosin plant community.

Little Pee Dee Heritage Preserve – This 9,000 acre tract is in both Marion and Horry Counties. This property protects the rare sarvis holly, a mature floodplain forest, and scenic frontage along the Little Pee Dee River. The preserve includes Knife Island and four scenic oxbow lakes. (SCDNR, Heritage Preserves).

Threatened & Endangered Species

Horry County has a variety of rare, threatened and endangered plant and animal species. Development, logging, the use of pesticides, fishing and hunting are just a handful of reasons why some animal populations have declined in

Horry County and throughout the Country. Invasive plants and animals that out compete and consume similar resources are another reason for the decline in certain plant and animal species.

The loggerhead sea turtle is probably one of the most well-known endangered species. Their populations began to rebound with the use of Turtle Excluder Devices in commercial fishing nets and through volunteer efforts to protect and monitor nests along the beach.

There are a number of threatened and endangered birds that reside or migrate through Horry County. The red-cockaded woodpecker is a well-known endangered species in this region, as they rely upon old growth long leaf pines which nearly disappeared from Horry County in the late 1800s. Similarly, the bald eagle remains threatened in South Carolina, although it has been taken off the endangered list at the Federal level. Bald eagle populations declined drastically from the 1940s through the 1970s due to the loss of habitat, shooting, and pollutants like DDT. Their populations continue to recover and have become a success story of the Endangered Species Act.

Through conservation and habitat restoration efforts, many plant and animal species are on the road to recovery. Despite these efforts, additional rare, threatened, and endangered species continue to be added to State and Federal listings. The following table is a list of threatened and endangered species found in Horry County. A complete list of rare species is available in **Appendix III.**

Table 2: Threatened and Endangered Species in Horry County. Source: Updated from SCDNR, 2012.

Vertebrate Animals		
Loggerhead	*Caretta caretta*	Federally Threatened
Spotted Turtle	*Clemmys guttata*	State Threatened
Rafinesque's Big-eared Bat	*Corynorhinus rafinesquii*	State Endangered
Bald Eagle	*Haliaeetus leucocephalus*	State Threatened
Wood Stork	*Mycteria americana*	Federally Threatened
Red-Cockaded Woodpecker	*Picoides borealis*	Federally Endangered
Least Tern	*Sterna antillarum*	State Threatened
Swallow-Tailed Kite	*Elanoides forficatus*	State Endangered
Vascular Plants		
Seabeach Amaranth	*Amaranthus pumilus*	Federally Threatened
Chaffseed	*Schwalbea americana*	Federally Endangered

Invasive Species

Invasive species are non-native plant, insect or animal species that have been introduced into an area outside of their original range and compete with native species for resources. Invasive species reproduce and spread rampantly because they have no natural enemies in their new homes. Invasive species are recognized as one of the leading threats to biodiversity and impose enormous costs to agriculture, forestry, fisheries, and other human enterprises, as well as to human health. Most recent estimates indicate that 42 percent of the nation's endangered and threatened species have declined as a result of encroaching exotic invasive species (SCDNR, 2008).

Not all non-native species are invasive, as many have become naturalized over time. For instance a large number of agricultural crops and ornamental plants are non-native (exotic) in origin. Exotic plants are only a problem when they escape cultivation, spread rapidly and aggressively compete with native species. Some examples of invasive plants in Horry County include Chinese Tallow, Beach Vitex, Bamboo, Ligustrum, Mimosa, Wisteria, Phragmites, and Water Hyacinth (Miller, 2010). Unfortunately many of these plants continue to be sold in nurseries, as they spread quickly and require little care. See **Appendix IV** for a list of invasive plant species.

Invasive insects also threaten forest and agricultural resources in Horry County. The Asian Longhorned Beetle, Brown Marmorated Stink Bug, and the Fire Ant are just a few of the commonly found invasive insects in South Carolina that negatively impact the agricultural industry. In 2011, the Kudzu Bug arrived in South Carolina and quickly spread to every county in the State within the year, damaging soybean crops. Untreated soybeans are estimated to have a 20 percent loss in South Carolina (Clemson, 2014).

Photo 11: Kudzu Bug. Credit: Clemson

Invasive animals can also be found in Horry County, including, but not limited to feral hogs, coyotes, and the apple snail. Feral hogs were brought to South Carolina by its earliest settlers. They breed quickly, compete with native wildlife for food, and damage upland and wetland habitats. Coyotes are another well-known invasive animal that were first introduced in Horry County in the 1970s, likely by hunters. Coyotes are known for preying on small game, outdoor pets, and deer. The apple snail is another invasive which was likely introduced in North America by someone emptying their aquarium into a lake or pond. Apple snails threaten wetlands by consuming plant material and altering the natural balance of the ecosystem (ANS, 2005).

New invasive species will likely be introduced into our County, either by human actions or by changes in the range of wildlife. Preventing further spread of invasive species and restoring impacted sites is a monumental task that depends on public awareness, eradication measures, and ongoing monitoring.

Habitat Fragmentation

The rise of suburban sprawl as the prevalent development pattern in America has resulted in extensive disruption, or fragmentation, of the landscape. Fragmentation reduces the diversity of wildlife, contributes to the degradation of water resources, and impacts community character. As development occurs, elements like roads, houses, railways, parking lots and utility lines divide the natural landscape into ever-smaller pieces, or fragments. Natural habitat areas are reduced in size and quality, and native plant and animal populations decline. Some of the more sensitive species disappear. Compared to the obvious damage of a filled wetland or a clear-cut forest, the effects of fragmentation are subtle.

Every type of animal or plant has certain requirements for survival, including such key elements as food, water, and shelter. The minimum area required to provide these needs and the amount of human disturbance that can be tolerated varies widely by species. For example, a single black bear needs anywhere from 6 to 160

sq. miles for roaming and foraging, depending upon the availability of food, water, and shelter (SCDNR, 2013). Roadways and development can divide their foraging and roaming area and put them at risk to being hit by motor vehicles.

As research continues, it is becoming clear that for many types of wildlife, it's not the total acreage of habitat that counts, but how much of that habitat exists in large, undisturbed tracts. For biodiversity, bigger is better. According to ecologists, large areas of continuous, unfragmented natural lands with a diversity of habitat types are needed. Experts also suggest that scattering moderate sized, 125 – 500 acre natural areas is also necessary. These smaller preserves can support species that do not require large forests in which to breed, and may even support small populations of the more sensitive species. Ideally, these smaller tracts should be as close as possible to larger tracts, contain a diversity of habitat/landscape types, and be connected to other natural areas. Isolated pockets of natural lands are of value to the community, but to maximize ecological value it is important to connect open space wherever possible. Parcels contiguous to existing large and medium-sized tracts should be given high priority for conservation. Riverine floodplains should be targeted as these areas serve as both critical habitat and wildlife corridors for almost 70 percent of all vertebrate species.

Habitat fragmentation is the largest threat to wildlife in Horry County. While State and Federal agencies, in addition to many private land holders, have protected their lands from development, many native species remain threatened by habitat fragmentation. Retaining the environmental, social and economic benefits of unfragmented open land requires a strategy that combines natural resource-based community planning and design, land conservation, and wise management of both developed and natural areas.

AIR RESOURCES

Historically, air quality has not been a concern in Horry County, as there are few point sources emitting chemicals into the air. In addition, the prevailing winds coming off of the ocean disperse most point and non-point sources of air pollution. While air quality is not a major concern in Horry County, the pollution generated here only exacerbates pollution problems elsewhere. Air pollution is becoming a more significant issue in South Carolina and throughout the World. The Waccamaw Air Quality Coalition was formed to serve as a forum to discuss air quality concerns and share ideas to reduce air pollution in the tri-county region (Georgetown, Horry, Williamsburg Counties).

Air Quality

The SC Department of Health and Environmental Control is responsible for air quality monitoring. Air monitors are operated throughout the state to measure the concentrations of pollutants in the air. Through the Clean Air Act, the U.S. Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment.

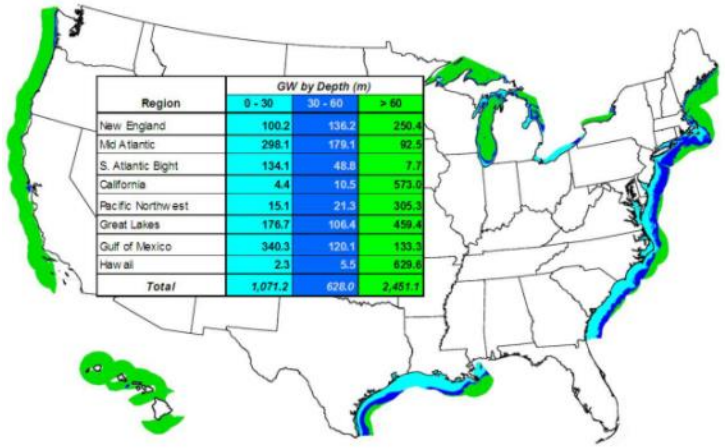
The air pollution in Horry County can be divided into several types of sources. Point sources are large, fixed sources, such as industrial sites that emit pollutants from activities on the site. Area sources are also fixed sources, but they are generally small and widespread. Common examples of area sources are dry cleaners and gasoline refueling stations. The mobile source category of air pollution is broken into on-road and non-road sources. On-road sources refer to highway vehicles, and non-road sources refer to vehicles or equipment, such as construction equipment and recreational boats. The EPA monitors emissions in several different ways from monitoring point sources, like smoke stacks of power plants, to measuring particulate matter and ozone at selected locations to capture the overall conditions of an airshed. As of 2012, there were only two active point source emitters in the County, far fewer than 12 just ten years ago. Inevitably, the emissions from point sources have

reduced over time. SCDHEC no longer operates a particulate matter monitoring station in Horry County, although one was active in Myrtle Beach from 1990-2008. During that time, area sources served as the largest source of air pollution. This trend has likely changed, as vehicular traffic has increased and point sources have decreased.

SCDHEC has also not consistently operated an ozone monitoring site in Horry County because past studies and monitoring have indicated good air quality. SCDHEC is now exploring a potential ozone monitoring site in either Horry or Brunswick County because the EPA monitoring standards have evolved and because Horry County and Brunswick counties are now part of a Metropolitan Statistical Area. On-road vehicles are likely the largest contributor to ozone emissions in Horry County and other pollutants, like nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead. On-road pollution can be reduced by improving the flow of traffic, reducing idling times, and reducing the total number of on-road vehicles by providing alternative transportation options.

Wind Energy

In order to protect air quality and reduce fossil fuel emissions, the EPA is calling for states to diversify their energy sources. Horry County has two potential renewable energy sources available to supply the State's power grid, including wind and solar energy. The South Atlantic Bight, including the Grand Strand, has been identified as a suitable location to establish off-shore wind turbines because of the available wind resource and the shallow water depths (Musial and Bam, 2010). The



Map 9: US Offshore Wind Resources by Region and Water Depth for Annual Wind Speed Sites over 7.0 m/s. Source: Musial and Bam, 2010.

slope is much more gradual in waters off the Carolinas than in other areas off the Eastern Seaboard, meaning the towers can be positioned 10 or more miles from beaches without impairing scenic views. In the Fall of 2014, the Bureau of Ocean Energy Management is expected to announce the location of offshore tracts that will be available to lease for wind power farms (Jones, 2014).

South Carolina is well situated to become an economic hub for offshore wind development. General Electric already operates the largest wind turbine manufacturing facility in the United States in the upstate. In addition, Clemson University's Restoration Institute in Charleston operates the largest wind turbine testing facility in the world (Colbert-Busch, 2012). All of these factors make Horry County a prime location to incorporate offshore wind resources into the power grid.

The North Strand Wind Coalition Wind Team was established to support the development of wind energy in the Grand Strand and within the state. Since its inception, the City of North Myrtle Beach passed a resolution in support of the development of offshore wind resources and to accommodate electric cables from offshore sites through its deepwater stormwater outfalls. Additionally, the City of North Myrtle Beach has adopted a Small Wind Energy Systems Ordinance to promote the use of small onshore wind turbines, but in a manner that does not have adverse effects on neighboring properties (Ord. No. 10-03, § 1, 4-5-10). Onshore wind turbines can already be seen among beach resort high rises in North Myrtle Beach.

Photo 12: Onshore Wind Testing Turbine, North Myrtle Beach Oceanfront Park. Source: Aisha Khan, SCNow

Solar Power

Solar energy is also an opportunity in Horry County, whether at the single homeowner level or large scale operations. South Carolina residents can receive a 25 percent tax credit for the installation of solar panels. Similar credits are also available for businesses. While the use of solar power is not prevalent in Horry County, Santee Cooper is working to expand its presence through demonstration projects. Santee Cooper installed the state's largest grid-tied solar array, consisting of 1,350 solar panels, on its maintenance facility on 10th Avenue in Myrtle Beach.

Photo 13: Solar Array on Santee Cooper Facility

Myrtle Beach Middle School has also been equipped with a solar array on its rooftop. Santee Cooper and the state's electric cooperatives partnered to install solar in twenty schools throughout South Carolina, calling them Green Power Solar Schools. The initiative was designed to encourage interest in the environment and demonstrate the feasibility and limitations of renewable power generation. Each Green Power Solar School received a 2-kilowatt solar power system, a new renewable energy curriculum designed especially for the program that meets state science standards, and access to an Internet-based monitoring system that provides real-time data on the system's performance as well as systems at other solar schools in South Carolina.

While large solar installations are not common in Horry County, there are many rooftops that could be equipped to provide power to the grid. Additionally, solar farms may prove to be a viable alternative for underutilized farmland in Horry County.

PARKS & RECREATION

Recreation plays an important role in Horry County, as it is the number one economic driver on the Grand Strand. The Horry County Parks and Recreation Department was created in 1997 to meet the immediate and long-term recreation needs of County residents. The Department's activities are funded through property taxes, taxes on Sunday alcohol sales, and grants. A special tax district in Socastee also finances a separate community recreation fund for this area.

In 1999, the Parks and Recreation Department funded the development of the *Horry County Recreation Needs Assessment for 1999-2009*. This document revealed that the County's active and passive recreational facilities had not caught up with the rapid growth of the region. The Assessment identified the number and types of facility improvements needed to meet projected population growth. It also provided park prototype facilities, including models for community parks, district recreation complexes, civic parks and regional parks. To date, the Parks and Recreation Department has nearly achieved the development of the recreational facilities proposed within the assessment. A complete list of Horry County recreational facilities can be found in the Horry County Parks and Open Space Plan.

Population growth and tourist use has exceeded anticipated trends identified within the Assessment. In addition, the trends in recreation continue to evolve and there is now a greater interest in providing alternative types of recreation, like skate parks, disc golf, paddling, and mountain biking. The County will continue to evaluate the recreational needs of our residents and part-time residents to ensure that existing and future recreational improvements meet their needs.

BEACHES, BOATING, AND BLUEWAYS

Beach Accesses

Horry County has over 30 miles of beachfront with over 350 public beach access sites, 21 of which are within the jurisdiction of Horry County, including those in Garden City and along Shore Drive. Many private access points and those within

the City of Myrtle Beach and the City of North Myrtle Beach have lifeguards available during the peak tourist season. Horry County is working to improve its beach access sites by providing improved parking and accessibility for golf carts and cyclists, in addition to showers and restroom facilities in some locations. Many sites have also been landscaped to ensure they are aesthetically pleasing and inviting. The Myrtle Beach Boardwalk is also a notable beach access site. This 1.2 mile walkway provides the public with access to the beach and to restaurants, shops, and entertainment.

Boat Landings

There are 32 public boat landings in all of Horry County, 28 of which are managed by Horry County Parks and Recreation. Most of the landings are located inland along black water rivers, including the Waccamaw (12), Pee Dee (2), Little Pee Dee (8) and Lumber Rivers (2). There are 6 landings located on the Intracoastal Waterway and 2 along tidal creeks. Because water-based recreation plays such an important role in the County, it is critical to ensure that these landings are maintained, inviting and safe.

Photo 14: Hwy 17/22 Boat Landing

Fishing

Fishing remains one of the most popular recreational activities for residents and tourists in Horry County. While Horry County has an abundance of freshwater fishing opportunities, saltwater fishing remains the most popular recreational activity in Horry County. In 2013, nearly 45,000 saltwater fishing licenses were issued in Horry County, accounting for 20.85 percent of all saltwater fishing licenses purchased in the State.

Horry County supported over 35 percent of the state's 14-day saltwater fishing licenses with nearly 26,000 of those issued were for non-residents. These numbers do not include the number of commercial fishing licenses, which would include charter fishing vessels or seafood suppliers. Commercial and charter fishing is heavy in the Little River area, as the Little River Waterfront has access to both the Atlantic Ocean and to the Intracoastal Waterway.

Because fishing is such a large interest to residents and vacationers, it is critical to maintain, enhance, and expand waterfront access at area piers, beaches, and boat landings. It also presents an economic opportunity for the development of additional marinas, boat maintenance and storage facilities, and public waterfront boardwalks and docks. There is also a marketing opportunity to help expand fishing to our freshwater resources and extensive inland waterways.

Photo 15: The Little River Waterfront serves as an economic development and recreational opportunity.

Water Sports

There are a variety of water-based sports available for residents and visitors to partake in, including surfing, paddling, parasailing, and jet skiing. Surfing and parasailing are exclusive to the beach, while paddling occurs at the beach and along the Intracoastal Waterway and rivers. Motorized boats and jet skis are only allowed to launch from the beach during the off-season. The City of North Myrtle Beach even allows banana boat rides from the beach during the summer. Commercial operations, however, are limited to private facilities, like marinas and private property,

as commercial use of public boat landings and beaches is prohibited, with the exception of those businesses with approved franchise agreements. Most local governments in Horry County offer the rental of umbrellas and beach chairs either through their parks departments or through an approved franchise agreement. Commercial boating operations are prohibited along the beach.

Blueways

There are two official paddling trails that traverse Horry County, including the Waccamaw River Blue Trail and the Southeast Coast Saltwater Paddling Trail. The **Waccamaw River Blue Trail** extends from Chris Anderson Landing on Hwy 9 in Horry County to East Bay Park in the City of Georgetown. This trail meanders through the protected bottomland hardwood swamps of the Waccamaw National Wildlife Refuge and the historic riverfront cities of Conway and Georgetown. The Blue Trail was established by American Rivers, a non-profit river advocacy group, and the National Parks Service. Its implementation is also supported by the Pee Dee Land Trust and the Waccamaw Riverkeeper Program.

The **Southeast Coast Saltwater Paddling Trail** (SECT) is another blueway that traverses Horry County. It spans from the Chesapeake Bay to the Georgia-Florida border, following the Intracoastal Waterway. For over 800 miles, the SECT hugs the coastal waters of Virginia, North Carolina, South Carolina, and Georgia, providing a unique opportunity for paddlers to experience an unbroken trail through four states in the tidal marshes and rivers of the southern USA. The National Parks Service, along with a number of agencies in Georgia, South Carolina, North Carolina, and Virginia were involved in the establishment of this paddling trail.

WILDLIFE VIEWING AND HUNTING

Wildlife Viewing

Horry County has a variety of scenic locations in which to enjoy nature and view wildlife. The Little Pee Dee River is designated as a Scenic River and is an ideal location to view wildlife by water. The Waccamaw River is another waterway in which to

view birds, alligators, beavers, and other wildlife. Further to the south, the Waccamaw National Wildlife Refuge has a number of locations in which to view threatened bird species, like the Swallow-Tailed Kite and Bald Eagle. Vereen Memorial Gardens also provides a great viewing area of tidal marshes in Little River, and of course, the beach provides a great location to view a variety of migratory birds. Waites Island provides an exclusive wildlife viewing location. While not publically accessible by car, its beach can be reached by boat.

Hunting

Hunting is a common sporting activity in rural areas of Horry County. In 2013, 2,575 hunting and sportsman licenses were issued, in addition to 3,011 combination hunting and fishing licenses. The hunting of deer, duck, doves, alligator and bear all require supplemental licenses. Hunting of migratory birds and waterfowl are by far the most popular types of hunting in Horry County. Big game licenses, mainly for deer, are also popular. Hunting typically occurs on private land, in addition to wildlife management areas. While hunting is popular, there are only three outdoor shooting ranges in all of Horry County.

HIKING TRAILS AND GREENWAYS

Hiking Trails

Hiking trails are limited in Horry County and consist mainly of nature trails at area parks and wildlife management areas. Popular nature trails include those at Myrtle Beach State Park, Vereen Memorial Gardens, and Cox Ferry Recreation Area. Walking paths can also be found at Loris Nature Park and Playcard Environmental Center. In addition, the Horry County Bike and Run Park has over 6 miles of mountain biking trails. There remains an opportunity to expand walking, hiking, and biking trails throughout the County. There is also a need to provide trails for equestrian and ATV users.

East Coast Greenway

The East Coast Greenway (ECG) is a multi-use trail system that extends from Maine to the Florida Keys, connecting urban areas with rural communities. In Horry County, the ECG is designed

for pedestrians and cyclists. There is an ECG Master Plan for Horry and Georgetown Counties that identifies route options and design criteria for the various sections of the trail and for the location of formal trailheads. Multiple segments of the trail have been completed in North Myrtle Beach, Myrtle Beach, Garden City, Litchfield, and Pawleys Island through the financial support from the Grand Strand Area Transportation Study (GSATS) Transportation Improvement Program (TIP). There remains the need to connect these various segments to allow for a continuous path through our region. There is also the need to develop sections of the trail through natural areas of the County. The East Coast Greenway, in addition to other pedestrian and cycling facilities, are discussed in further detail in the Transportation Element of the Comprehensive Plan and in the Horry County Bicycle and Pedestrian Plan.

CAMPING

There are numerous campgrounds in Horry County that cater to visitors with recreational vehicles (RVs). Such campgrounds are prevalent near Surfside Beach and off of Kings Road. There are nearly 9,000 campsites available in the County. RV camping is so popular that it makes up a total of 9 percent of the vacation accommodations in the Grand Strand (HC, 2012).

While RV campsites are prevalent throughout the County, tent camping is limited and mainly available at resorts along the beach. Myrtle Beach State Park is the only public park facility in the County that provides tent sites near the beach. Along the Lumber, Little Pee Dee, and Waccamaw Rivers in Horry County, there are no public or privately operated campgrounds for RVs or tents. However, there is a growing interest among paddlers and local residents for such facilities, as many people would like to paddle extensive lengths of these scenic rivers. While camping is allowed below the high water line or on sandbars along these rivers, their fluctuating water levels hinder such activities for the cautious. Campers are allowed to spend up to 3 days at county boat landings, but there are no restroom facilities and the rural segments of the County's waterways do not have trash receptacles. Safety

is also a concern for campers using the landings, as many rural landings are not patrolled regularly by Horry County Police. The lack of inland camping opportunities and a growing interest in paddling along our blackwater rivers may indicates the need for public or private parks, nature trails, paddling access and camping facilities. This would provide improved public access to our blackwater rivers and provide additional outdoor recreational opportunities for residents and vacationers.

Photo 16: Camping at Jordan Lake Landing

RECREATION FACILITIES & COMPLEXES

Horry County has an abundance of public recreational facilities that not only enhance the quality of life for our residents, but also support sports tourism. The following represent just a few examples of the recreational facilities in Horry County.

Horry County Parks and Recreation

Horry County Parks and Recreation operates more than 25 parks including: 32 baseball/softball fields; 16 tennis courts; 2 rugby fields; 17 soccer fields; 1 volleyball court; 2 disc golf courses; 10 basketball courts; and, 16 playgrounds. The County also has four community recreation centers, including North Strand Park, Carolina Forest Recreation Center, James Frazier Community Center, and the South Strand Recreation Center. Of these, three have gymnasiums for indoor athletic events.

Vereen Memorial Gardens is an Horry County Park located in Little River on more than 115 acres of forest and marshland and situated on the Intracoastal Waterway. It is a unique wildlife

refuge and botanical garden that has numerous trails and boardwalks.

Loris Nature Park is located across the street from Loris High School on 24 forested acres. It boasts a playground, pavilions, amphitheater, walking trails, dog park, and an 18 hole disc golf course.

City of Myrtle Beach- Grand Park and Indoor Athletic Center

The Grand Park Complex at Market Commons features seven large multipurpose fields and two youth fields. All have synthetic grass and lights and are designed to accommodate a variety of sports, including baseball, softball, lacrosse, soccer and football. Grand Park hosts dozens of national athletic tournaments annually and is located adjacent to The Market Common, Crabtree Memorial Gymnasium and a roller hockey rink.

Construction on the $12.4 million **indoor Athletic Complex** located adjacent to the Myrtle Beach Convention Center is slated to open in 2015. It is planned to include eight basketball courts, 16 volleyball courts, a café and retail area, an entertainment zone complete with a climbing wall and a 1500-seat telescopic bleacher system. It is also configurable for numerous indoor sports.

City of North Myrtle Beach Recreation Complex

The newly developed North Myrtle Beach Recreation Complex offers 4 regulation youth baseball/collegiate softball fields, 2 regulation high school/collegiate baseball fields, 8 regulation soccer/lacrosse fields, 8 batting tunnels, picnic shelters, 3 playgrounds, amphitheatre, walking/bike trails, 3 acre dog park, 25 acre lake for water-related activities, and a 10 acre meadow.

City of Conway Recreation Complex

The Conway Recreation Complex has been expanded and to include five baseball, softball, and t-ball fields, one soccer field, one football field and two multipurpose fields. The indoor facilities include indoor aquatic facilities, two full sized gyms, cardio center and free weight room and numerous community meeting spaces.

Cox Ferry Lake Recreation Area

Cox Ferry Lake Recreation Area along Jackson Bluff in Conway is owned and operated by US Fish and Wildlife. It has three trails of varying lengths including a boardwalk which allows hikers to meander through a flooded cypress swamp. Additional trails are being added to this passive recreation area. The property also has a pavilion, fishing dock, and launch area for non-motorized boats. Visitors can expect to see a variety of forest wildlife, including an array of plants and animals associated with bottomland hardwood habitats.

Myrtle Beach State Park

Myrtle Beach State Park was built in the 1930s by the Civil Conservation Corps, making it the first state park in South Carolina. The park is 312 acres and includes a campground, cabins, a mile of beach, picnic areas, fishing pier and nature center. Park rangers use the nature center and park grounds as an interactive learning environment to provide a variety of curriculum-based programs for students throughout the year as well as extra programs for locals and tourists during the summer months. As a South Carolina Heritage Trust site, the park's nature trail showcases the last stands of maritime forests on the northern coast of the State.

Golf Industry

Golfing is a long-standing recreational activity in the Grand Strand. There are more than 100 golf courses located throughout the county, which includes the only public course, Whispering Pines Golf Club which is owned by the City of Myrtle Beach. For many visitors to Horry County, vacations center on the sport of **golf**. "From modest beginnings 40 years ago, Myrtle Beach has become one of the best known and most popular golf resort areas in the country with over four million rounds played annually. While the development of golf communities has slowed recently, the sport of golf remains popular.

GOALS AND IMPLEMENTATION STRATEGIES

Recognizing that Horry County will continue to grow in population and in popularity as a vacation destination and permanent place to live, it is important to ensure that growth occurs in a manner that is compatible with the natural environment. The following goals and strategies have been generated to ensure that our natural resources are protected and managed for the health, safety, and enjoyment of current and future residents.

WATERWAYS & WETLANDS

GOALS

- Improve the County's understanding of drainage and water quality problems.
- Maintain and improve surface and groundwater quality in Horry County.
- Encourage development techniques which maintain and improve water quality.
- Conserve the essential flood reduction, groundwater recharge, pollution filtering, and habitat functions of wetlands and floodplains.
- Educate residents, businesses, government staff, and visitors on water quality protection.

IMPLEMENTATION STRATEGIES

Improve the County's understanding of water quality and drainage problems.

- Continue to implement a countywide water quality monitoring program through the Waccamaw Watershed Academy and the Waccamaw Riverkeeper's Volunteer Monitoring Program.
- Continue to cooperate with local universities in understanding the effects of our land use decisions on watersheds.
- Continue to utilize up-to-date stormwater computer modeling software.
- Prepare comprehensive drainage maps for the County using up-to-date stormwater infrastructure, landcover and elevation data.
- Coordinate with SCDHEC, Grand Strand Water and Sewer, and local governments to identify and map the location of septic

systems throughout the county and require connection to sewer systems when septic systems fail to perform properly.

- Study land use and zoning around the Bucksport Water System wells and implement policies that would further their wellhead protection program.

Maintain and improve surface and groundwater quality in Horry County.

- Continue to implement an illicit discharge detection & elimination (IDDE) program based on the County National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Management Plan.
- Continue to implement a Construction and Post-Construction Site Runoff Program based on the County NPDES Phase II Stormwater Management Plan.
- Work with known sources of point source water pollution to maintain and reduce pollutant discharges.
- Coordinate with SCDHEC and local governments to develop TMDL and 319 watershed plans to provide a course of action to improve impaired water bodies.
- Continue to implement mining regulations that address environmental degradation concerns while balancing the need for mined materials.
- Continue to work with the Natural Resource Conservation Service, the Farm Bureau and local agricultural landowners to address issues that affect water quality, including confined animal feeding operations, buffering, and irrigation.
- Seek grant funding from SCDHEC and the EPA to remediate known water quality problems, such as failing septic systems, leaking underground storage tanks, and brownfield sites.

Encourage development techniques which maintain and improve water quality.

- Incorporate low impact design techniques into future County facilities to serve as a model for private developers.
- Provide for the inclusion of low impact development techniques into the County's Land Development Regulations, Zoning Ordinance, and Stormwater Design Manual.
- Provide incentives for developers to incorporate low impact development techniques into their developments.
- Reduce the use of impervious surface and encourage the use of pervious surfaces through amendments to the Land Development Regulations and Zoning Ordinance.
- Administer Green Awards to recognize developers and designers for the design and execution of environmentally sensitive developments.

Conserve the essential pollution filtering, groundwater recharge, and habitat functions of wetlands and floodplains.

- Encourage the creation of interstate and intergovernmental compacts which address watershed issues for the Pee Dee, Little Pee Dee, Lumber, and Waccamaw Rivers.
- Adopt a riparian and wetland buffer ordinance between development and water resources to allow for the natural filtration of pollutants.
- Provide incentives for developers to preserve contiguous areas of natural vegetation and wetlands in residential communities.
- Promote the Natural Resource Conservation Service's Wetlands Reserve Program as a viable conservation option for qualified landowners.
- Strategically conserve land along the Waccamaw and Little Pee Dee Rivers for the dual purpose of protecting ecologically

significant habitats and minimizing future flood losses.

- Explore creative planning techniques, such as transfer of development rights, as a means to minimize the alteration of wetlands.
- Encourage the establishment of local wetland mitigation banks for local developers and road construction projects to mitigate their wetland impacts within the County.
- Apply the Horry County Open Space Inventory to earn credits with the National Flood Insurance Program's Community Rating System; thereby, reducing flood insurance rates.

Educate residents, businesses, government staff, and visitors on water quality protection.

- Cooperate with public education providers through the Coastal Waccamaw Stormwater Education Consortium to provide water quality education, workshops, technical trainings, and publications to a variety of audiences.
- Provide new members of County Boards and Commissions with materials to educate them on existing County environmental regulations.

COASTAL RESOURCES

GOALS

- Preserve and enhance existing dune systems, beaches, and marshes to provide habitat for wildlife and protect coastal property.
- Protect and restore coastal water quality for recreational use, shellfish consumption, and wildlife.
- Minimize risk of flood damage to coastal properties, infrastructure, and habitats.

IMPLEMENTATION STRATEGIES

Preserve and enhance existing dune systems, beaches, and marshes to provide habitat for wildlife and protect coastal property.

- Work closely with property owners and Government Agencies to maintain the

protective, ecological and recreational functions of the beach/dune system.

- Develop strategies for erosion control and beach/dune restoration that will protect, preserve, restore and enhance the natural character of Horry County's beach/dune system.
- Pursue available state and federal funding for erosion control and beach/dune restoration along County beaches.
- Coordinate with natural resource agencies and trained volunteer organizations to protect and restore critical habitats for threatened or endangered species.
- Partner with local rental agencies and hotels to develop an outreach program to educate tourists on Horry County's unique and fragile coastal ecosystem.

Protect and restore coastal water quality for recreational use, shellfish consumption, and wildlife.

- Sustain and consider expanding the existing beach water quality program.
- Improve the water quality in swashes and their impact on beach water quality.
- Implement the Murrells Inlet Watershed-Based Plan that targets improving water quality in Murrells Inlet for shellfish consumption.
- Coordinate with the City of North Myrtle Beach, the Waccamaw Regional Council of Governments, and DHEC to develop a watershed plan for the Little River/Cherry Grove area.

Minimize risk of flood damage to coastal properties, infrastructure, and habitats.

- Adopt and implement policies and procedures to protect and improve those lands, structures and facilities along the oceanfront that contribute to the economic well-being of Horry County.
- Develop strategies and pursue funding assistance to reduce future losses from flood and storm hazards.

- Coordinate with natural resource agencies and trained volunteer organizations to protect and restore dune systems and tidal marshes.

AGRICULTURE

GOALS

- Conserve and protect the agricultural heritage of Horry County.
- Expand existing and develop new agricultural niches in Horry County.
- Develop and promote the local food industry.

IMPLEMENTATION STRATEGIES

Conserve and protect the agricultural heritage of Horry County.

- Encourage agricultural landowners to protect their property's agricultural use through conservation programs like the USDA's Farm and Ranch Land Protection Program or Pee Dee Land Trust's Land Conservation Program.
- Explore creative planning techniques, such as transfer of development rights, as a means to minimize the conversion of farmland into non-agricultural uses.
- Coordinate with area farmers to designate historic farms through the Century Farm Program or the Horry County Historic Property Register.
- Provide educational opportunities for youth and the public to learn about current and historical farming practices used in Horry County.

Expand existing and develop new agricultural niches in Horry County.

- Pursue a formal feasibility study for the development of a multi-use agricultural facility.
- Support agricultural and heritage tourism by developing special provisions within the Zoning Ordinance.
- Partner with area Chambers of Commerce to promote agricultural and heritage tourism.
- Work with regional peanut producers to pursue investment in peanut shelling facilities.

- Leverage existing export networks to develop a market for regionally grown sweet potatoes.

Develop and promote the local food industry.

- Support and promote Clemson Extension's Waccamaw Market Cooperative to ensure that the sale of local foods is prioritized at area farmers markets.
- Provide support infrastructure for local farmers markets at County facilities where deemed appropriate.
- Work with NRCS and Clemson Extension to educate farmers about transitioning their fallow land for the cultivation of fruits and vegetables.
- Increase the number of farmers that are certified to provide locally grown products to schools through the State's Farm to Schools Program.
- Expand the number of area restaurants, resorts, and grocery stores that sell local produce, cheeses, and meats.

FORESTRY

GOALS

- Promote sustainable forestry practices on public and private lands.
- Strive to become a Fire Adapted Community through wildfire education, mitigation, and improved interagency coordination.
- Improve the esthetics and environmental quality of development through the preservation of trees and installation of native landscaping.

IMPLEMENTATION STRATEGIES

Promote sustainable forestry practices on public and private lands.

- Promote the South Carolina Forestry Commission's (SCFC) Best Management Practices for forest landowners and professional foresters.
- Encourage private forest landowners to participate in the SCFC Forest Stewardship

Program, Forest Renewal Program, and the Forest Land Enhancement Program.

- Support SC Forestry, Clemson Extension, and the USDA's programs to educate private landowners and developers on the benefits of conserving and properly managing forest resources.

Strive to become a Fire Adapted Community through wildfire education, mitigation, and improved interagency coordination.

- Encourage the establishment of additional Firewise Communities through the SC Forestry Commission and the National Fire Protection Agency.
- Support residential communities that have already opted or are opting to become fireworks and outdoor burning free zones.
- Coordinate with Horry County Public Safety Division, SC Forestry, and residential communities to identify wildfire fuel mitigation opportunities.
- Work with SC Forestry, Horry County Public Safety Division, and Firewise Communities to develop a Countywide Wildfire Prevention Plan.
- Amend the Land Development Regulations to address defensible space as a wildfire mitigation technique when new development is proposed in close proximity to large tracts of forested land.
- Support SC Forestry and SCDNR's efforts to conduct controlled burns of Lewis Ocean Bay Heritage Preserve in an effort to reduce wildfire fuels.
- Provide public education on the threat of wildfires in Horry County.

Improve the esthetics and environmental quality of development through the preservation of trees and installation of native landscaping.

- Update the County's Tree Preservation Ordinance to clearly convey the number of trees that must be retained onsite or replaced with development.

- Promote the use of native plants by providing a landscaping guide for developers.
- Consider amending the Landscape Buffer and Tree Preservation Ordinance to allow for a fee-in-lieu for developments that cannot meet onsite landscaping requirements.
- Educate Horry County staff and elected and appointed officials about the County's Tree Mitigation Fund.
- Continue to utilize the County's Tree Mitigation Fund to support beautification of Horry County's main corridors.

SPECIES HABITAT

GOALS

- Minimize habitat fragmentation in environmentally sensitive areas.
- Conserve environmentally sensitive lands for habitat protection and the enjoyment of future generations.
- Promote the use of native species and the eradication of invasive species.
- Reduce litter to protect the County's habitats, wildlife, and recreation spaces.

IMPLEMENTATION STRATEGIES

Minimize habitat fragmentation in environmentally sensitive areas.

- Mitigate the impacts of existing and future transportation corridors to ensure that wildlife habitat fragmentation is minimized.
- Explore creative planning techniques, such as transfer of development rights, as a means to conserve important natural and scenic features of the County.
- Encourage the reuse of existing infrastructure rather than the expansion of infrastructure into undeveloped areas.

Conserve environmentally sensitive lands for habitat protection and the enjoyment of future generations.

- Update the Horry County Parks and Open Space Plan to identify priority conservation areas and future recreation sites.

- Ensure that the land acquisition and conservation strategies within the County are meeting the diverse habitat needs of species native to the landscape.
- Actively work to protect lands between existing, preserved large tracts of land within the County.
- Support SCDNR, USFWS, and area partners in their efforts to acquire conservation land.
- Evaluate the effectiveness of the open space requirements of the Land Development Regulations.
- Establish the Horry County Open Space Fund to accept fees-in-lieu from developers, property and financial donations to acquire priority lands identified within the Parks and Open Space Plan.
- Encourage property owners to participate in the Wildlife Habitat Incentives Program of the Natural Resources Conservation Service.

Promote the use of native species and the eradication of invasive species.

- Utilize only native and naturalized plant species in County landscaping projects.
- Remove invasive plant species from the County's list of acceptable landscaping materials included in the Zoning Ordinance and the Land Development regulations and provide native species alternatives.
- Promote the Clemson Extension's Carolina Yard Program to encourage the use of native plant species on residential properties.
- Coordinate with Clemson Extension and the Master Gardener Program to educate landowners, businesses, and developers on the benefits of native plant species and the negative impact of invasives.
- Coordinate with SCDNR, USFWS, and the USDA to address invasive species on public property, within waterways, and on agricultural lands.

Reduce litter to protect the County's habitats, wildlife, and recreation spaces.

- Establish a year-round litter reduction and enforcement program.
- Support volunteer-led litter cleanups of roadways, parks and other open spaces.
- Educate residents and visitors about the impacts of litter on the environment and property values.
- Beautify highway corridors and public spaces to encourage drivers to respect our County's roadways.
- Engage area businesses, churches, and community groups to lead and support litter reduction and beautification initiatives.
- Update the Land Development Regulations to provide minimum dumpster sizes for commercial and industrial uses.

AIR QUALITY

GOALS

- Reduce air pollution contributions from point and mobile sources.
- Identify renewable energy opportunities that may be harnessed by local businesses, industries, and residents.

IMPLEMENTATION STRATEGIES

Reduce air pollution contributions from point and mobile sources.

- Monitor air quality in the Myrtle Beach Metropolitan Statistical Area.
- Encourage and support the use of alternative modes of transportation.
- Promote the concept of 'Complete Streets' to ensure connectivity of roads and bicycle and pedestrian paths with the goal of reducing commute times.
- Improve the flow of traffic along highway corridors to reduce vehicle idle times and emissions.

Identify renewable energy opportunities that may be harnessed by local businesses, industries, and residents.

- Identify incentives, credits and opportunities related to the installation and use of solar panels, wind turbines, or other types of renewable energy sources.
- Explore off-shore wind industries as an economic opportunity for the Grand Strand.
- Consider amending the Zoning Ordinance and Land Development Regulations to allow for solar panels and small wind energy systems.
- Consider amending the Zoning Ordinance and Land Development Regulations to allow for solar fields in rural areas of the County.
- Participate in the regional Air Quality Coalition led by the Waccamaw Regional Council of Governments.

PARKS AND RECREATION

GOALS

- Ensure the number, types, quality and distribution of recreational facilities meet the needs of existing and projected populations.
- Improve public access to natural resources for passive recreation opportunities.
- Foster and promote recreation-based tourism in Horry County.

IMPLEMENTATION STRATEGIES

Ensure the number, types, quality and distribution of recreational facilities and programs meet the needs of existing and projected populations.

- Update the Recreational Needs Assessment and Action Plan to identify current recreational needs, trends, and priorities of full-time and seasonal residents.
- Create and maintain a Recreation Inventory, cataloging and mapping all recreational facilities, trails, and properties in Horry County.

- Coordinate with area municipalities on an ongoing basis to maintain the Recreation Inventory and assist with the siting and development of future recreational facilities.
- Develop a Recreational Maintenance Plan to project the maintenance needs and costs of existing facilities.
- Incorporate recreational facility development and improvements into the Horry County Capital Improvements Plan.
- Ensure that playgrounds, parks, and other recreational spaces meet the latest National Safety Guidelines and ADA accessibility regulations.
- Actively seek grants to help fund the development of new recreational facilities and programs.
- Coordinate with area developers and businesses on the donation of land and equipment to support future recreational facilities.

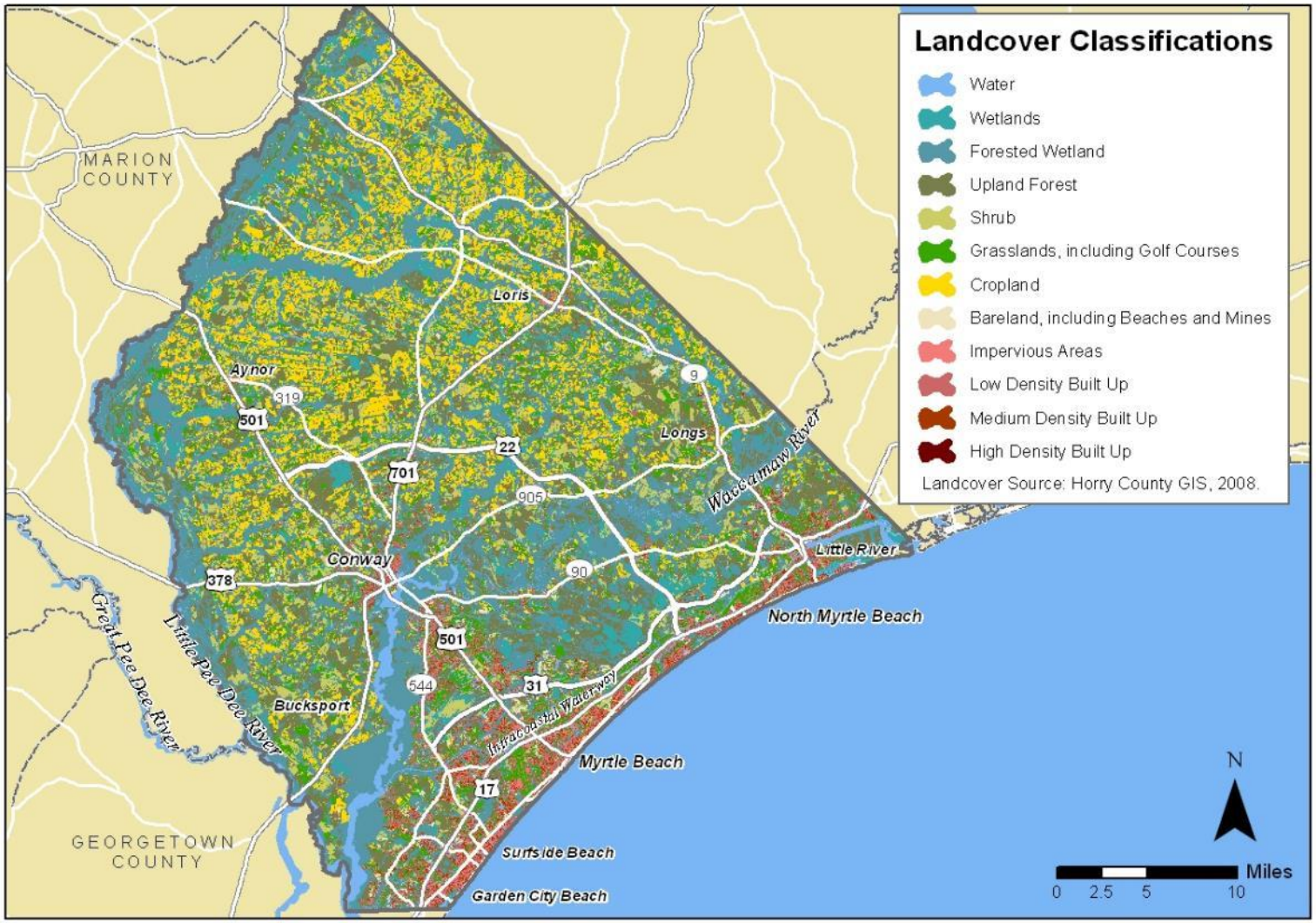
Improve public access to natural resources for passive recreation opportunities.

- Consider the development of a Blueways and Greenways Master Plan to identify existing and potential trail systems for paddlers, cyclists, pedestrians, and equestrians.
- Coordinate with federal and state agencies and conservation organizations to identify passive recreation opportunities on existing conservation land.
- Improve public access on County-owned properties by providing walking trails, scenic overlooks, picnic sites, fishing docks, boardwalks, and eco-learning experiences.
- Connect park sites and open spaces with biking and pedestrian trails.
- Maintain and enhance existing boat landing and beach access sites.
- Consider the development of waterfront parks in areas where boating, fishing, and scenic access is limited.

Foster and promote recreation-based tourism in Horry County.

- Convene a nature-based tourism partnership that focuses on the development of new heritage tourism, eco-tourism, and agri-tourism enterprises.
- Coordinate with area Chambers of Commerce to promote area fishing, hunting, paddling, and eco-tour guide businesses.
- Improve user recognition of Horry County Parks and Recreation facilities by branding its signs, brochures, and website.
- Explore the development of franchise agreements at boat landings and beaches for the rental of non-motorized boats, fishing equipment, and guided tours.
- Consider the development of an Equestrian Center to host large scale equine events.
- Improve ballfields to attract tournaments.

APPENDIX I: MAPS

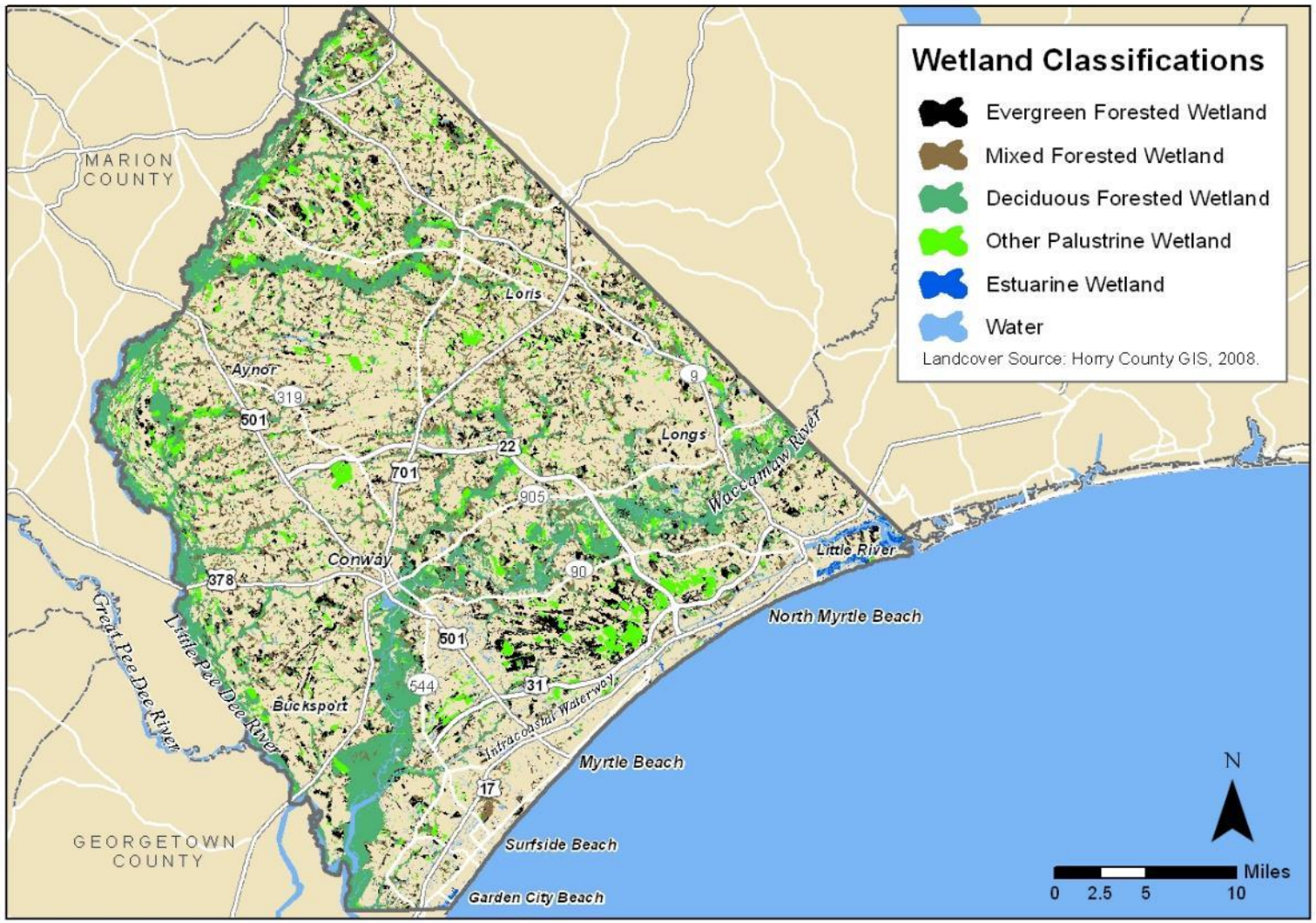


Appendix Map 1: Landcover Classifications

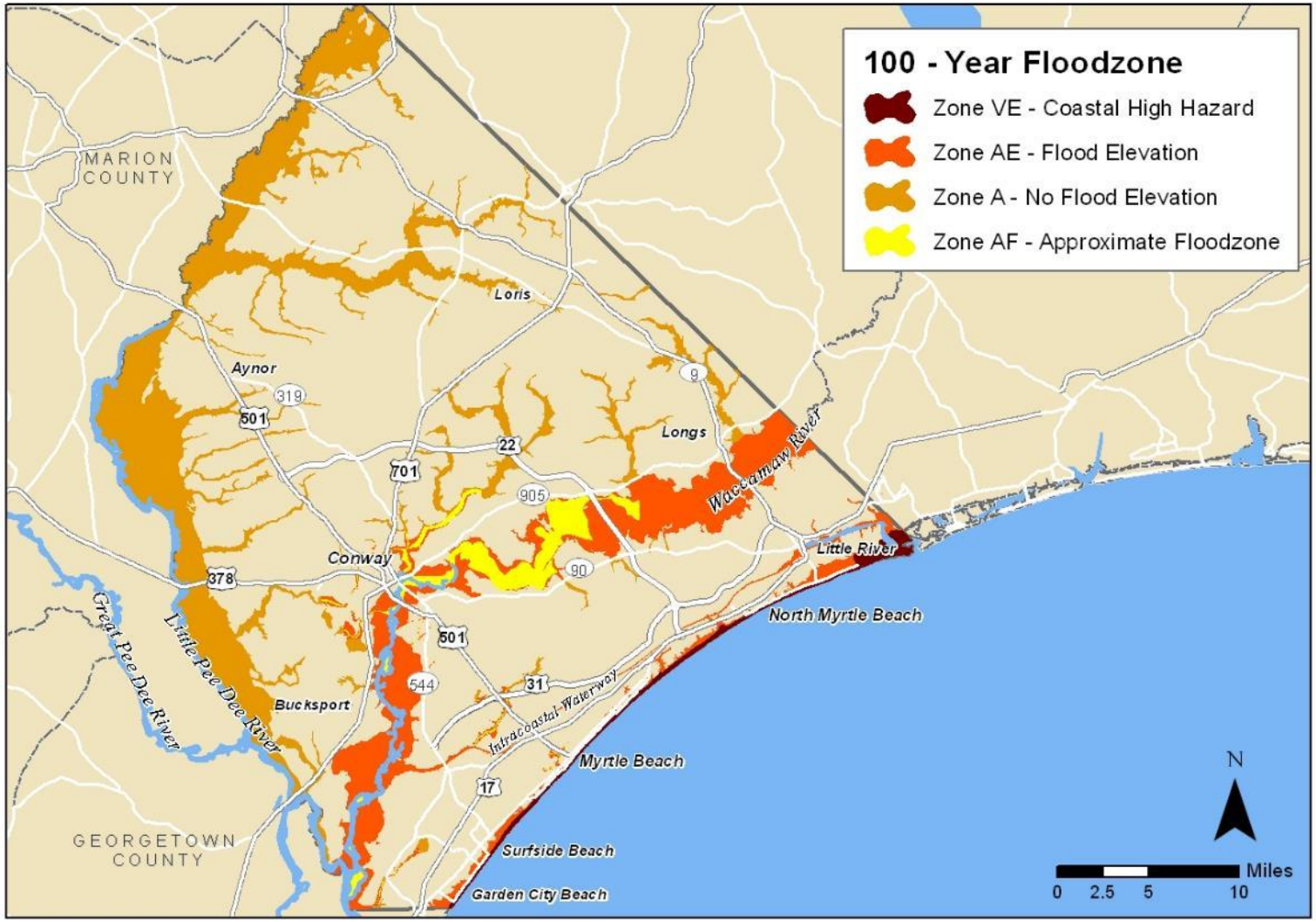
Appendix Table 1: Expanded Landcover Classifications

Landcover Classification	Sq Miles	Acres	Percent
Water	29.40	18,814.30	2.57
Other Palustrine Wetlands	64.42	41,227.48	5.63
Other Estuarine Wetland	3.06	1,930.12	0.26
Deciduous Forested Wetland	163.08	104,370.03	14.24
Mixed Forested Wetland	120.85	77,342.71	10.55
Evergreen Forested Wetland	68.11	43,587.66	5.95
Upland Deciduous Forest	0.34	217.52	0.03
Upland Evergreen Forest	211.63	135,444.47	18.48
Upland Mixed Forest	2.34	1,498.44	0.20
Shrub	102.82	65,805.53	8.98
Grassland	114.03	72,981.07	9.96
Golf Course	9.96	6,375.91	0.87
Orchards, Groves, and Vineyards	0.37	239.65	0.03
Cropland	48.71	31,175.12	4.25
Cleared Agriculture	97.55	62,432.81	8.52
Bare Land	9.84	6,296.66	0.86
Mine	0.83	529.40	0.07
Beach	1.26	803.70	0.11
Low Density Built Up	26.37	16,877.46	2.30
Medium Density Built Up	22.21	14,216.15	1.94
High Density Built Up	0.59	378.04	0.05
Impervious	12.62	8,077.29	1.10
Structure	14.17	9,071.38	1.24
Paved Road	14.85	9,506.12	1.30
Unpaved Road	5.75	3,680.36	0.50
Total	**1,145.16**	**732,879.38**	**100.00**

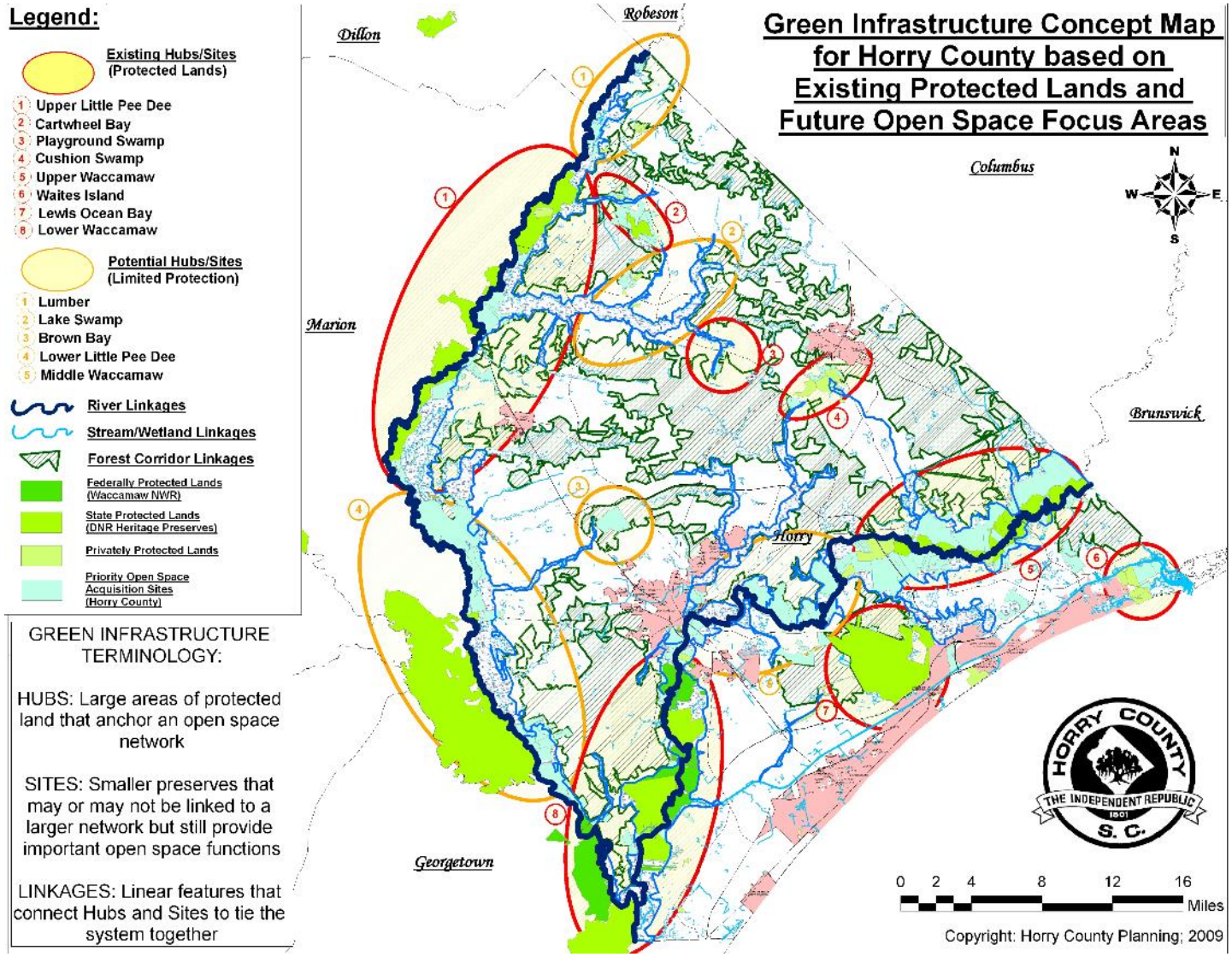
Note: The mapping analysis underestimated the total beach area, as the analysis was limited to areas included within the county's official boundaries, which does not include a majority of the beach.



Appendix Map 2: Wetland Classifications



Appendix Map 3: 100 - Year Floodzone



Appendix Map 4: Priority Conservation Areas

APPENDIX II: WATER QUALITY IMPAIRMENTS

Appendix Table 3: 2012 LIST OF 303 D IMPAIRED WATERS IN HORRY COUNTY.

WATERBODY	STATION	DESCRIPTION	IMPAIRMENT	CAUSE
LUMBER RIVER	PD-664	CAUSEY LANDING	FISH	MERCURY
LUMBER RIVER	PD-038	RICEFIELD COVE LANDING	AQUATIC LIFE	DISSOLVED OXYGEN
LUMBER RIVER	PD-038	RICEFIELD COVE LANDING	RECREATION	FECAL COLIFORM
LUMBER RIVER	PD-038	RICEFIELD COVE LANDING	FISH	MERCURY
LITTLE PEE DEE	PD-351	CEDAR CREEK AT SC HWY 23	AQUATIC LIFE	DISSOLVED OXYGEN
LITTLE PEE DEE	PD-054	SANDY BLUFF LANDING	FISH	MERCURY
LITTLE PEE DEE	PD-176	LAKE SWAMP ON PEE DEE HWY	RECREATION	FECAL COLIFORM
LITTLE PEE DEE	RS-06009	BOB'S BRANCH AT SEA BREEZE DR, GREEN SEA	AQUATIC LIFE	DISSOLVED OXYGEN
LITTLE PEE DEE	RS-03513	LOOSING SWAMP ON NICHOLS HWY	AQUATIC LIFE	DISSOLVED OXYGEN
LITTLE PEE DEE	PD-657	GUNTER'S LAKE LANDING	FISH	MERCURY
LITTLE PEE DEE	PD-691	HUGHES LANDING	FISH	MERCURY
LITTLE PEE DEE	PD-350	PUNCHBOWL LANDING	FISH	MERCURY
LITTLE PEE DEE	PD-620	HWY 378	FISH	MERCURY
GRT PEE DEE	CSTL-559	YAUHANNAH LANDING @ 701 BRIDGE	FISH	MERCURY
WACCAMAW	MD-124	CHRIS ANDERSON LANDING AT SC 9	FISH	MERCURY
WACCAMAW	PD-363	SIMPSON CREEK AT SC 905	RECREATION	FECAL COLIFORM
WACCAMAW	CSTL-553	RED BLUFF LANDING AT SC 31	FISH	MERCURY
WACCAMAW	PD-369	REAVES FERRY LANDING	RECREATION	FECAL COLIFORM
WACCAMAW	CSTL-554	REAVES FERRY LANDING	FISH	MERCURY
WACCAMAW	CSTL-555	WACCAMAW RIVER DR, CONWAY	FISH	MERCURY
WACCAMAW	RS-06165	BRIDGE ON STERITT SWAMP RD, CONWAY	AQUATIC LIFE	DISSOLVED OXYGEN
WACCAMAW	RS-06165	BRIDGE ON STERITT SWAMP RD, CONWAY	RECREATION	FECAL COLIFORM
WACCAMAW	MD-158	LONG AVE AT CRAB TREE SWAMP, CONWAY	AQUATIC LIFE	DISSOLVED OXYGEN
WACCAMAW	MD-158	LONG AVE AT CRAB TREE SWAMP, CONWAY	RECREATION	FECAL COLIFORM
WACCAMAW	RS-04375	US 501 AT CRAB TREE SWAMP, CONWAY	RECREATION	FECAL COLIFORM
WACCAMAW	RS-05561	HELLHOLE SWAMP AT MCNABB SHORTCUTT RD, LORIS	AQUATIC LIFE	DISSOLVED OXYGEN
WACCAMAW	RS-10389	BROWN SWAMP AT US 701	AQUATIC LIFE	DISSOLVED OXYGEN

WATERBODY	STATION	DESCRIPTION	IMPAIRMENT	CAUSE
WACCAMAW	MD-107	KINGSTON LAKE AT LAKESIDE DR CONWAY	AQUATIC LIFE	DISSOLVED OXYGEN
WACCAMAW	MD-107	KINGSTON LAKE AT LAKESIDE DR CONWAY	RECREATION	FECAL COLIFORM
WACCAMAW	PD-638	BEAR SWAMP AT PITCH LANDING RD, CONWAY	AQUATIC LIFE	BIODIVERSITY
WACCAMAW	CSTL-556	PITCH LANDING, CONWAY	FISH	MERCURY
WACCAMAW	MD-144	TODDVILLE LANDING	FISH	MERCURY
WACCAMAW	MD-145	1 MILE SOUTH OF BUCKSVILLE LANDING	FISH	MERCURY
WACCAMAW	CSTL-557	BUCKSPORT LANDING	FISH	MERCURY
WACCAMAW	MD-136	1/4 MILE UPSTREAM OF JCT WITH ICW	FISH	MERCURY
ICW	CSTL-558	SOCASTEE SWING BRIDGE	FISH	MERCURY
ICW	RS-03332	STALVEY CREEK AT SC 707	RECREATION	FECAL COLIFORM
ICW	MD-163	6TH AVE S, NORTH MYRTLE BEACH	FISH	MERCURY
LITTLE RIVER	01-01	LITTLE RIVER JETTY	SHELLFISH	FECAL COLIFORM
LITTLE RIVER	01-02	MOUTH OF DUNN SOUND CREEK	SHELLFISH	FECAL COLIFORM
LITTLE RIVER	01-05	BIG BEND UP DUNN SOUND CREEK	SHELLFISH	FECAL COLIFORM
HOG INLET	MD-276	53RD AVE, NEAR CHERRY GROVE LANDING	AQUATIC LIFE	DISSOLVED OXYGEN
HOG INLET	MD-276	53RD AVE, NEAR CHERRY GROVE LANDING	AQUATIC LIFE	HEAVY METALS
HOG INLET	01-19	MAIN CREEK AT 53RD AVENUE , CHERRY GROVE	SHELLFISH	FECAL COLIFORM
HOG INLET	01-17	42ND AVENUE, CHERRY GROVE	SHELLFISH	FECAL COLIFORM
BEACH	02-01	WHITE POINT SWASH, ATLANTIC BEACH/NORTH MYRTLE	SHELLFISH	FECAL COLIFORM
BEACH	WAC-009A	WHITE POINT SWASH, ATLANTIC BEACH/NORTH MYRTLE	RECREATION	ENTERO
BEACH	02-02	SINGLETON SWASH, ARCADIA SHORES	SHELLFISH	FECAL COLIFORM
BEACH	WAC-015	SINGLETON SWASH, ARCADIA SHORES	RECREATION	ENTEROCOCCUS
BEACH	WAC-015A	BEAR BRANCH SWASH, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	02-03	CANE PATCH SWASH, MYRTLE BEACH	SHELLFISH	FECAL COLIFORM
BEACH	WAC-016A	CANE PATCH SWASH, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-017	64TH AVE N, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	01-17A	53RD AVE BRIDGE, DEEP HEAD SWASH, MYRTLE BEACH	SHELLFISH	FECAL COLIFORM
BEACH	WAC-018	50TH AVE N, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-020	24TH AVE N, MYRTLE BEACH	RECREATION	ENTEROCOCCUS

WATERBODY	STATION	DESCRIPTION	IMPAIRMENT	CAUSE
BEACH	WAC-021	8TH AVE N, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	03-01	WITHERS SWASH, MYRTLE BEACH	SHELLFISH	FECAL COLIFORM
BEACH	WAC-022A	WITHERS SWASH, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-024	23RD AVE S, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	03-02	MIDWAY SWASH, MYRTLE BEACH	SHELLFISH	FECAL COLIFORM
BEACH	WAC-025A	MIDWAY SWASH, MYRTLE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-028	PIRATELAND SWASH	RECREATION	ENTEROCOCCUS
BEACH	WAC-029	OCEAN LAKES CAMPGROUND	RECREATION	ENTEROCOCCUS
BEACH	WAC-029A	S OCEAN LAKES	RECREATION	ENTEROCOCCUS
BEACH	WAC-031	11TH AVE N, SURFSIDE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-031A	SWASH AT 5TH AVE N, SURFSIDE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-032	3RD AVE N, SURFSIDE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-033	3RD AVE S, SURFSIDE BEACH	RECREATION	ENTEROCOCCUS
BEACH	WAC-035	13TH AVE S, SURFSIDE BEACH	RECREATION	ENTEROCOCCUS

Impairment (Use): Aquatic Life, Fish=Fish Consumption, Shellfish= Shellfish Consumption, Recreation= Swimming

Cause:

- Fecal Coliform and Enterococcus. Fecal bacteria that can transmit diseases to humans through contact with water or the consumption of contaminated shellfish.
- Dissolved Oxygen. Aquatic life requires oxygen for survival. When too many nutrients are in the water column and a lot of vegetation is present, it consumes the dissolved oxygen, not leaving enough for other aquatic life.
- Heavy Metals. Heavy metals are toxic to aquatic life and are typically found in sediments. They are introduced to natural waters through runoff from roads, as metals are common components of automobiles and petroleum products.
- Mercury. Mercury can be found in fish, especially in the Waccamaw, Little Pee Dee, and Lumber Rivers. Mercury can cause birth defects and other health problems if consumed.
- Biodiversity: The abundance and diversity of macrobentic invertebrates is used as an indicator of ecosystem health. When it does not exist in its natural condition, it is an indicator of decreasing environmental quality.

SOURCE: SCDHEC. 2012. List of 303 D Impaired Waters. http://www.scdhec.gov/environment/water/tmdl/docs/tmdl_12-303d.xls

Appendix Table 4: 2014 Fish Consumption Advisories

WATERBODY	LOCATION	SPECIES OF FISH	ADVISORY
Lumber River	From NC/SC State Line to the Little Pee Dee River	Bowfin (Mudfish)	DO NOT EAT ANY
		Channel Catfish	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Bluegill	1 meal a month
		Chain Pickerel	1 meal a week
		Redear Sunfish	1 meal a week
Little Pee Dee River	From NC/SC State Line to the Great Pee Dee River	Blue Catfish	DO NOT EAT ANY
		Bowfin (Mudfish)	DO NOT EAT ANY
		Chain Pickerel	DO NOT EAT ANY
		Flathead Catfish	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
		All Other Fish	1 meal a week
Waccamaw River	From the NC/SC State Line to U.S. Hwy 17	Bowfin (Mudfish)	DO NOT EAT ANY
		Largemouth Bass	DO NOT EAT ANY
		Chain Pickerel	1 meal a month
		Black Crappie	1 meal a week
		Blue Catfish	1 meal a week

		Bluegill	1 meal a week
		Channel Catfish	1 meal a week
		Redear Sunfish	1 meal a week
		Warmouth	1 meal a week
Intracoastal Waterway	From Little River Inlet to the Waccamaw River	Bowfin (Mudfish)	1 meal a month
		Bluegill	1 meal a week
		Redear Sunfish	1 meal a week
		Largemouth Bass	1 meal a week
Atlantic Ocean	Atlantic Ocean off the SC Coast	Shark	DO NOT EAT ANY **
		King Mackerel > 39 inches	DO NOT EAT ANY **
		King Mackerel 33-39 inches	1 meal a week **
		King Mackerel < 33 inches	No Restrictions **
		Swordfish	1 meal a month **
		Cobia	1 meal a month **
		Tilefish	1 meal a week **

**EPA and FDA advise women who are or may become pregnant, nursing mothers, and children under 14 not to eat any king mackerel, shark, swordfish or tilefish.

Source: SCDHEC. 2013 SC Fish Consumption Advisories.
https://www.scdhec.gov/administration/library/ML-004042.pdf

APPENDIX III: HORRY COUNTY RARE SPECIES

The following species have been identified as rare either at the national or state-level. These species are likely to become threatened or endangered if measures are not taken to protect them and their habitat. Species are listed by both their *scientific* and common names.

Vertebrate Animals	
Fundulus diaphanus	Banded Killifish
Heterodon simus	Southern Hognose Snake
Pituophis melanoleucus	Pine or Gopher Snake
Ursus americanus	Black Bear
Invertebrate Animals	
Elliptio congaraea	Carolina Slabshell
Lampsilis splendida	Rayed Pink Fatmucket
Villosa delumbis	Eastern Creekshell
Vascular Plants	
Agalinis aphylla	Coastal Plain False-foxglove
Agalinis maritima	Salt-marsh False-foxglove
Andropogon mohrii	Broomsedge
Anthaenantia rufa	Purple Silkyscale
Asclepias pedicellata	Savannah Milkweed
Balduina uniflora	One-flower Balduina
Calamovilfa brevipilis	Pine-barrens Reed-grass
Calopogon barbatus	Bearded Grass-pink
Chamaedaphne calyculata	Leatherleaf
Coreopsis gladiata	Southeastern Tickseed
Coreopsis integrifolia	Ciliate-leaf Tickseed
Coreopsis rosea	Rose Coreopsis
Crotonopsis linearis	Narrowleaf Rushfoil
Dionaea muscipula	Venus' Fly-trap
Echinodorus tenellus	Dwarf Burhead
Eupatorium recurvans	Coastal-plain Thorough-wort
Fimbristylis perpusilla	Harper's Fimbry
Helenium brevifolium	Shortleaf Sneezeweed

Vascular Plants	
Helianthemum georgianum	Georgia Frostweed
Ilex amelanchier	Sarvis Holly
Juncus abortivus	Pinebarren Rush
Lachnocaulon beyrichianum	Southern Bog-button
Lechea torreyi	Piedmont Pinweed
Lilaeopsis carolinensis	Carolina Lilaeopsis
Lipocarpha micrantha	Dwarf Bulrush
Litsea aestivalis	Pondspice
Lygodium palmatum	Climbing Fern
Minuartia godfreyi	Godfrey's Stitchwort
Oxypolis ternata	Piedmont Cowbane
Parnassia caroliniana	Carolina Grass-of-parnassus
Peltandra sagittifolia	Spoon-flower
Physostegia leptophylla	Slender-leaved Dragon-head
Plantago sparsiflora	Pineland Plantain
Pteroglossaspis ecristata	Crestless Plume Orchid
Pyxidanthera barbulata	Well's Pyxie Moss
Rhynchospora oligantha	Few-flowered Beaked-rush
Ruellia pedunculata ssp. pinetorum	Stalked Wild Petunia
Sabatia bartramii	Bartram's Rose-gentian
Sabatia kennedyana	Plymouth Gentian
Sarracenia rubra	Sweet Pitcher-plant
Scleria baldwinii	Baldwin Nutrush
Solidago pulchra	Carolina Goldenrod
Sporobolus teretifolius	Wire-leaved Dropseed
Stylisma pickeringii var. pickeringii	Pickering's Morning-glory
Tofieldia glabra	White False-asphodel
Xyris brevifolia	Short-leaved Yellow-eyed Grass
Xyris flabelliformis	Savannah Yellow-eyed Grass

Source: SC Department of Natural Resources, 2012. http://www.dnr.sc.gov/species/pdf/Horry2012.pdf

APPENDIX IV: INVASIVE PLANT SPECIES IN HORRY COUNTY

Trees	
Ailanthus altissima	Tree-of-Heaven, Ailanthus, Chinese Sumac, Stinking Sumac, Paradise-tree
Albizia julibrissin	Silktree, Mimosa, Silky Acacia, Japanese Mimosa
Broussonetia papyrifera	Paper Mulberry
Cinnamomum camphora	Camphortree, Camphor Laurel, Shiu Leaf, Gum Camphor, Laurel Camphor
Elaeagnus angustifolia	Russian Olive, Oleaster
Firmiana simplex	Chinese Parasoltree, Phoenix Tree, Varnish-tree
Melia azedarach	Chinaberrytree, Persian Lilac, Pride-of-India
Morus alba	White Mulberry, Common Mulberry
Paulownia tomentosa	Princesstree, Paulownia, Royal Empresstree, Royal Paulownia
Poncirus trifoliata	Trifoliate Orange, Hardy Orange,
Pyrus calleryana	Bradford Pear, Callery Pear
Schinus terebinthifolius	Brazilian Peppertree
Triadica sebifera	Tallowtree, Popcorntree, Chinese Tallowtree
Vernicia fordii	Tungoil Tree, Chinese Wood-oil Tree
Shrubs	
Berberis thunbergii	Japanese Barberry
Elaeagnus pungens	Silverthorn, Thorny Olive
Elaeagnus umbellata	Autumn Olive
Euonymus alatus	Winged Burning Bush
Lespedeza bicolor	Shrubby Nonnative Lespedezas

Shrubs, continued	
Ligustrum japonicum	Japanese Privet
Ligustrum lucidum	Glossy Privet
Ligustrum sinense	Chinese Privet
Ligustrum obtusifolium	Border Privet
Ligustrum ovalifolium	California Privet
Ligustrum vulgare	European Privet
Lonicera x bella	Bell's Honeysuckle
Lonicera fragrantissima	Sweet-Breath-of-Spring, Winter Honeysuckle, Fragrant Honeysuckle
Lonicera maackii	Amur Honeysuckle
Lonicera morrowii	Morrow's Honeysuckle
Lonicera tatarica	Tatarian Honeysuckle
Mahonia bealei	Leatherleaf Mahonia
Nandina domestica	Nandina, Heavenly Bamboo, Sacred Bamboo
Spiraea japonica	Japanese Spiraea, Japanese Meadowsweet
Polygonum cuspidatum	Japanese Knotweed, Fleeceflower, Mexican Bamboo
Rosa bracteata	Macartney Rose
Rosa laevigata	Cherokee Rose
Rosa multiflora	Multiflora Rose
Pyrus calleryana	Bradford Pear, Callery Pear
Spiraea japonica	Japanese Spiraea, Japanese Meadowsweet, Maybush
Solanum viarum	Tropical Soda Apple

Vines & Others	
Akebia quinata	Five-Leaf Akebia, Chocolate Vine
Ampelopsis brevipedunculata	Amur Peppervine, Porcelain Berry
Arundo donax	Giant Reed
Cactaceae spp., Opuntia spp.	Cactus
Eragrostis curvula	Weeping Lovegrass
Ipomoea pes-caprae	Railroad Vine
Lonicera japonica	Japanese Honeysuckle
Imperata cylindrica	Cogongrass
Phyllostachys aurea	Bamboos
Pueraria montana var. lobata	Kudzu
Vitex rotundifolia	Beach Vitex
Yucca aloifolia	Spanish Bayonet, Dagger Plant
Wisteria sinensis	Chinese Wisteria
Wisteria floribunda	Japanese Wisteria

Source: Miller, James H., Chambliss, Edwin B., Loewenstein, Nancy J. (2010). A field Guide for the Identification of Invasive Plants in Southern Forests. USDA Forest Service, Southern Research Station.

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