NATURAL RESOURCES ELEMENT

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Introduction

The goal of the Natural Resources Element is to identify, promote, and enhance the natural resources in Georgetown County and correlate the overall vision of the Comprehensive Plan with these goals and objectives; by implementing strategies to:

- *Protect and sustain the natural resources of the region, making the protection of these resources a top priority in shaping the future of the county.*
- *Sustain natural environments, habitats, and wildlife for the general health, safety and welfare of current and future generations.*
- *Maintain, enhance, and/or restore the integrity of wetlands, watersheds, and flood plains in the county to help mitigate personal property from flood loss and provide for a more resilient ecology.*
- *Sustain and rejuvenate upland and coastal habitats, while limiting development in these critical environments to protect our natural resources.*
- *Protect and conserve wetland habitats, salt water marshes, and forested lands from residential and commercial encroachment throughout the Waccamaw Neck and other sensitive environmental areas.*
- Protect agricultural lands, rural landscapes, air and water quality, and natural resource areas.

The growth and economic stability of Georgetown County are based on our natural resources in ways not comparable to other areas. A diversity of natural resources including clean water, productive habitats, and abundant wildlife are among the greatest assets in the County**.** Wooded areas and open spaces, along with the robust network of natural rivers, lakes and ponds contribute to the hydrologic function of county's watersheds. Provisions should be made for the protection and conservation of the natural resources that support and enhance the quality of life in Georgetown County.

Tourism, agriculture, fisheries and forestry also depend on these valuable natural resources. The County must maintain abundant, accessible, and sustainable natural resources in order to appeal to tourists and promote sustainable growth. Natural resources will provide the County with long term stability, ecology, biodiversity, and growth if they are safeguarded and considered a key component for economic and development decisions. A recent poll conducted by the County as part of the comprehensive planning process shows that 96% of area residents rank preservation of natural resources as a top priority. Considering the facts that our natural resources provide a multitude of ecosystem services, such as water filtration, erosion reduction, and flood waters storage, it seems fitting that these natural resources and their services are held with such upmost importance.

Comprehensive Planning is a balancing act between the physical, cultural, historical, and economic impacts on a community. All development decisions by both the Planning Commission and County Council should be made with our natural resources in mind. The Natural Resources Element includes ten (10) sections as mandated by the state statute below, and those sections that can significantly impact the natural environment and shape the future development of Georgetown County.

SC Code of Regulations - Section 6-29-510: (3)

Section I
BACKGROUND

South Carolina, and especially Georgetown County, is blessed with abundant natural resources, diverse landscapes, and scenic beauty. These natural resources and access to the bounty of the sea and its tidal marshes encouraged settlement of the region hundreds of years ago and continue to drive the economy of the area today. Natural Resources could be defined as raw materials from the earth that man extracts and employs for some use.[1] But they are so much more than this defines. Natural Resources provide infinite value to the public's health, safety, and welfare in our community. Typically these resources include air, water, land, minerals, and plant and animal life; or a combination thereof. These basic building blocks help tie Georgetown's economy back to the land that gave its ancestors prosperity years ago.

Georgetown County has historically been a natural resource-based economy. Early examples include naval stores, indigo and rice production.

The natural resources form the character of the County and are also the foundation of its culture, heritage, environment and economy. Native plants and animals provided the County's earliest industries and formed the foundation for natural cash crops like rice, indigo, fur and timber. It is these diversified natural resources that gave Georgetown County's economy a competitive advantage. However, these resources must be protected, promoted, and utilized in a way that ensures economic vitality and sustainable growth in the future.

Geography at a Glance

Georgetown County has a total of 814.86 square miles. It is located in the Atlantic Coastal Plain, which consists chiefly of unconsolidated rock material approximately 1,200 feet thick. Georgetown County is generally level or gently sloping, with elevations ranging from sea level to a maximum of about seventy-five (75) feet. Marshy or low-lying regions are quite characteristic of the terrain. Only three percent (3%) of the County exceeds fifty (50) feet in elevation.

gtcouty.org

Situated on the southeast Atlantic Coast, Georgetown County has an annual average temperature of 63.8[2] F. The annual rainfall for the Georgetown area is 55.07[3] inches. The peak rain periods normally occur during the months of July and August. An abundance of natural resources are available in Georgetown County. These resources include, but are not limited to, solar and wind energy, mineral deposits, soil fertility, timber, water power (stream flow and tides), fisheries, wildlife, natural scenery and recreational opportunities. Natural resources are generally regional in terms of their location and impact. In order to

[1] "The Economic Contribution of Natural Resources to South Carolina's Economy"; David B. Willis & Thomas J. Straka, Clemson University, December 2016.
[2] https://www.dnr.sc.gov/climate/sco/ClimateData/countyData/county_georgetown.php; SC State Climatology Office, 30-year Climate Normals, Mean Temp, Brookgreen Gardens, Georgetown County, SC.
[3] https://www.dnr.sc.gov/climate/sco/ClimateData/countyData/county_georgetown.php; SC State Climatology Office, Precipitation Records (1957-2020), Brookgreen Gardens, Georgetown County, SC.

study Georgetown County holistically, it is necessary to examine the entire Pee Dee region. The remaining sections of this Chapter provide a foundation for continuing and initiating efforts to maintain the levels of quality found in the many natural resources of Georgetown County.

Section II
SOILS, MINERALS, and SLOPE CHARACTERISTICS

The majority of soils found within the County have loamy sand or sandy loam surface textures and sandy-to-sandy clay subsoils. Drainage varies from moderate to very poorly drained soil types. Along the coast where development pressures are the greatest, the soils are thick beds of level or dunned sand. The capabilities and limitations of soils in the county have a pronounced influence on how land is used for both urban and rural purposes.

Each of the major soil associations found in Table 4.0 (Appendix A) is rated in accordance with the following categories:[4]

- ***Slight Limitations*.** Development should present few soil related problems. Isolated soil deposits within the associations may, however, be unsuitable for certain applications, and an on-site investigation is recommended.
- ***Moderate Limitations.*** Development can be economically feasible, but should not be considered without extensive on-site soil investigation.
- ***Severe Limitations.*** Development is extremely hazardous and will be difficult and costly. Development should generally be discouraged and absolutely prohibited without extensive investigation.

Soil characteristics are a major factor when assessing the feasibility of constructing roadways, residential and commercial buildings, and other vital infrastructure. To view an interactive GIS map of the County soils layer, visit the Georgetown County GIS server at *https://georgetown.maps.arcgis.com/home/index.html*

There are multiple types of soils that make up the fertile grounds in this region. From sands to loams to clays, Georgetown County utilizes a unique biomass of soil and mineral types that help define the region. Table 4.1 (Appendix A) shows the details of all the types of soils, total acreages, and the total percent of each soil type for the area.

Soil erosion, both water and wind driven, can be a major issue for the riverine and coastal shorelines of the County. Soil and sediment from excessive soil erosion can cause a number of downstream impacts including the reduction of cropland productivity, damaging fish and wildlife habitats, clogging storm drainage systems, and increasing cost associated with water treatment. To learn more:
https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/erosion/

Engineering techniques can be employed in many cases to overcome inherent limitations due to the presence of certain soil types. Knowing and understanding these limitations is important when proceeding with all types of construction projects. Promotion of

[4] Full report on Table 8, Page 79-80 of Soil Survey of Georgetown County of South Carolina.

stormwater management and soil conservation can be utilized to properly recognize the suitability and limitations of these soil types.

At the county and regional levels, it is important that all large-scale development projects refer to soil-to-soil survey information. Planners and resource managers can obtain soil survey & technical assistance from the U.S.D.A. Natural Resources Conservation Service, but this should not be used in place of a geotechnical engineering report for construction.

Section III
AGRICULTURAL RESOURCES

Prime agricultural soils are included in some of the major soil associations in Georgetown County. These soils, as defined by the U.S. Department of Agriculture, are the soils best suited to producing food, feed, forage, fiber and oilseed crops. These soils have properties that are favorable for the economic production of sustained high yields of crops. About 115,000 acres or 22% of the county is considered prime agricultural land. The Census of Agriculture indicates that there are a total of 166 active farms within Georgetown County. These farms comprised a total of 80,272 acres primarily west of the Waccamaw River in the western section of the county. In 2017, agricultural land had an average farm size of 484 acres, up by 52% from 2012. These farms generated an estimated product market value of $9,273,000[5] with the primary crops consisting of Corn, Soybeans, Cotton and Tobacco (order of total acreage). To put this on a national scale, these numbers rank Georgetown 2,693 out of 3,143 counties.

farmflavor.com

Trends in the numbers above clearly show that this once prosperous agricultural region has now evolved. Likewise, the egression of farming as a trade has become a nationwide event. More and more young Americans are moving towards industrial and tech related jobs, rather than working off the land. The trend continues to show over the past century that Georgetown County has redeveloped from an agricultural market into an industrial, and now tourist, driven society. Georgetown County farming and farm statistics from the USDA can be found here: https://www.nass.usda.gov/Statistics_by_State/South_Carolina/index.php

For decades, farmers have produced the bulk of our local product through industrial type agriculture, or a system dominated by farms growing the same crops year after year, using chemical pesticides and fertilizers that can damage our soil, water supply, air, and even climate. This agricultural system is not built to last, because it squanders and degrades the resources it depends on.[6]

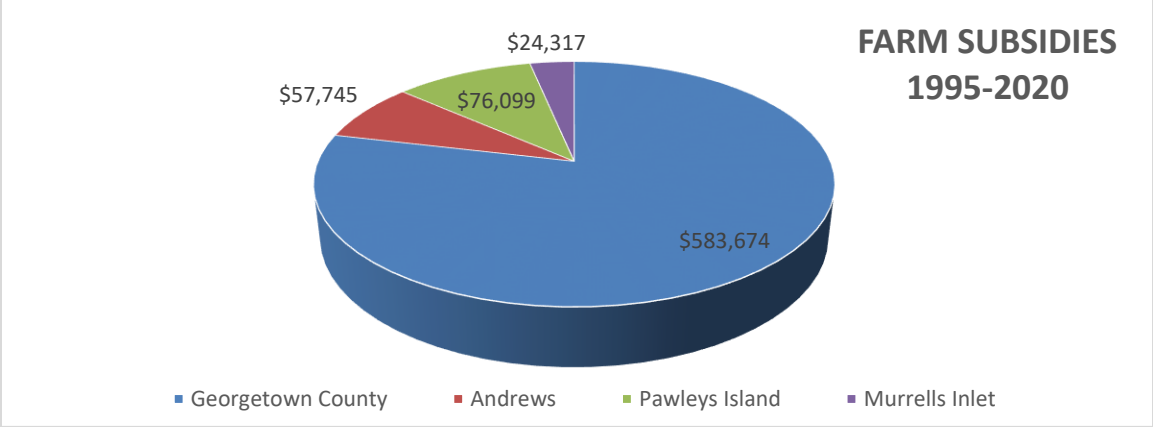
One of the main goals of the USDA Strategic Plan 2022-2026 is to foster a sustainable agricultural system, making it more resilient to issues like climate change and the use of

[5] 2017 Census of Agriculture, County Profile, Georgetown County, SC page 1. www.nass.usda.gov.
[6] https://www.ucsusa.org/resources/what-sustainable-agriculture.

harmful chemicals that are destroying our natural resources.[7] To offset the non-point source chemicals used in current agricultural practices, new agriculture systems should utilize organic materials and sustainable techniques (see Goal #3). This approach includes, but is not limited to, diversity by rotating crops, adopting agroforestry practices, integrating livestock and crops, reducing tillage, and planting cover crops during off-season months.

The SC Agritourism Association (SCAA) is also helping to promote and market "farm fun." This is a way for farmers to diversify their operations to make for agriculture-based activities that bring people to farms, ranches, and other agricultural settings. Some examples of agritourism include u-pick crop operations, corn mazes, on-the-farm restaurants and farm-to-table dinners. More information on this new rural, agriculture-based tourism front can be found on their website here: https://scagritourism.org/.

Subsidies – Farm subsidies, beginning in the 1930's, provided by the federal government are supposed to help agricultural producers manage the variations in agricultural production and profitability from year to year while ensuring a stable food supply. The 2014 farm bill limits the amount of payments a person who is "actively engaged" in farming to $125,000 per year. Small commodity farmers, like most of the farms in Georgetown County, only qualify for a mere pittance, while producers of meat, fruits and vegetables are almost completely left out of the subsidy market. Organic farming should be encouraged instead of government subsidies because it has far less impacts on the soils and groundwater contamination. Figure 4.2 below is a pie graph showing Georgetown County subsidies from 1995 through 2020.[8] Breakdown includes all subsidies whether they were from Conservation, Disaster, or Commodity. *Figure 4.2*



Drought – Another major condition affecting the agricultural and horticultural resources of our region is drought. Defined as a prolonged shortage in the water supply, whether atmospheric, surface water or ground water, drought can affect the County in many ways. The U.S. Drought Monitor (USDM) is a system that categorizes the intensity of drought through five (5) levels listed below. Current drought levels in Georgetown County, along with temperature, precipitation, and other climate related information, can be found on the NOAA drought website at https://www.drought.gov/states/south-carolina/county/georgetown

[7] 2022-2026 USDA Strategic Plan, https://www.usda.gov/sites/default/files/documents/usda-fy-2022-2026-strategic-plan.pdf.
[8] https://farm.ewg.org/top_recips.php?fips=45043&progcode=total_cr EWG's Farm Subsidy Database; 2022.

U.S. Drought Monitor (NOAA, USDA, & NDMC)	
D0	Abnormally Dry
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

Stakeholders – Agricultural Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
US Department of Agriculture (USDA)	Provide leadership on food, agriculture, NR, rural development, nutrition, and related issues through science.	Federal	http://offices.sc.egov.usda.gov
SC Department of Agriculture (SCDA)	Promote and nurture the growth and development of SC's agri-business while assuring safety and security.	State	http://agriculture.sc.gov
South Carolina Aquaculture Association (SCAA)	Benefits the production, promotion, and marketing of aquaculture in SC.	State	https://www.aquanet.com/united-states/columbia/aquaculture-aquaponics/south-carolina-aquaculture-association-scaa
South Carolina Agritourism Association (SCAA)	Dedicated to promoting and marketing agritourism farms.	State	https://scagritourism.org/sc-agritourism-association/

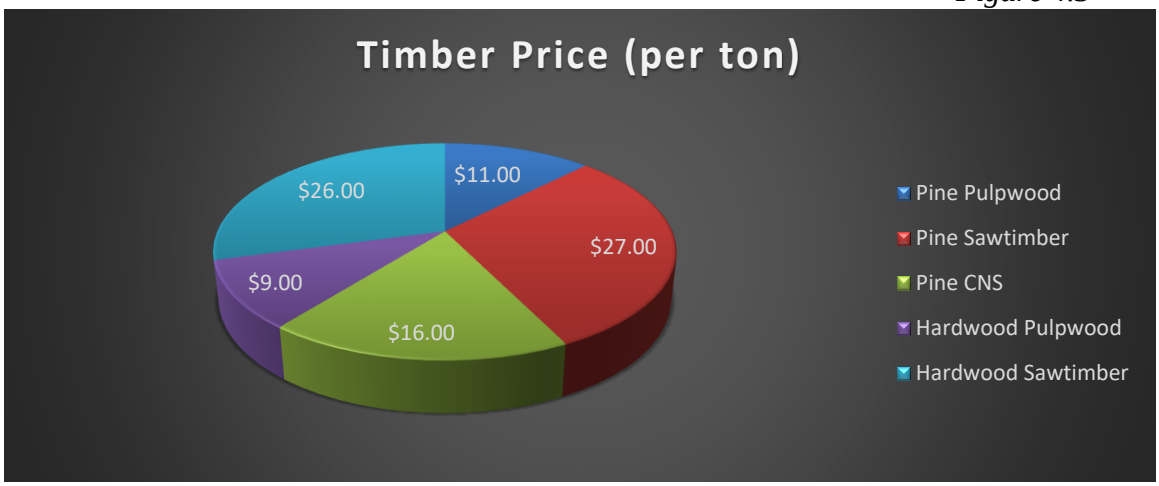
Section IV
FOREST AND WOODLAND RESOURCES

Georgetown County is rich in botanical resources. Chief among these resources are the forests which account for almost 650 square miles or about 3/4 of the total land area in the county. The multi-functional forests provide food and shelter for wildlife, filter out CO_2 emissions while producing oxygen, and help decrease the surface temperature. Grants available through multiple sources can aid in this preservation (see Goal #2). According to Georgetown County GIS satellite imagery, there are three (3) types of forests in the county. Evergreen Forests cover about 46% percent of the land in Georgetown County, Mixed Forests cover about 12% percent, and Saturated Bottomland Forests cover about 13%. Georgetown County forests most commonly include oak, slash pine, loblolly pine, bald cypress, tupelo gum, black willow, red maple and sweet gum trees.

scencyclopedia.org

Forests also provide economic wealth to the County's population in the form of timber production. New estimates show that forested land sales have doubled due to the increase in timber prices and production. Figure 4.3 shows the estimated timber prices (per ton) in Georgetown County from December 2021. These owners generally use the best management practices (BPM's) approach to managing the forest, which is referred to as the Sustainable Forestry Initiative. This management process balances the growing and harvesting of trees while also focusing on the protection of the wildlife habitat, soil, air and water quality.

Figure 4.3



Source: https://timberupdate.com/locations/georgetown-county-south-carolina/

Forestry and Forest-Products Industry

Of the 650 square miles of forests, roughly 1/4 are owned and used by the forest and paper industry. The forestry and forest-products industry have a total economic impact of $827 million in total industry output, $289 million in value-added, $161 million in wages and salaries, and 2,953 jobs. In addition, forestry-related activities contributed an estimated $57.25 million in tax revenue, $18.75 million of which went directly to state and local governments. Table 4.2 below shows the forestry and forest-products figures for Georgetown County.

Table 4.2

Forestry Sectors	# of Jobs	% of County	Labor Income ($)	% of County
Forestry & Logging	652	2.02	24,037,713	1.72
Solid Wood Products	253	0.78	15,314,731	1.10
Pulp and Paper	601	1.86	61,831,199	4.43
Wood Furniture	10	0.03	378,331	0.03
Subtotal	**1516**	**4.7**	**101,561,974**	**7.27**

Source:https://www.clemson.edu/extension/timber-market/files/impact/georgetown-county-forestry-impact.pdf Gtown County Economic Impact of Forestry & Forest-Products Industry, 2019; Khanal, Guynn, & Phinney, Clems0n Univ.

Fire Prevention and Protection

A relatively new program introduced by the Forestry Commission is Firewise USA, and it deals with the wildland-urban interface (WUI) that developing communities like Georgetown are facing on a daily basis. The WUI is a zone of transition between wilderness (unoccupied land) and land developed by human activity.[9] Human settlements in the WUI are at much greater risk to wildfires than urban developments. In an effort to combat these issues, the National Fire Protection Association's Firewise program educates communities and homeowners on how to protect their homes from potential wildfire damage. Only three (3) communities in Georgetown County are recognized as Firewise, they include Camden Creek at Allston Plantation, DeBordieu Colony, and Prince George. For more information on the Firewise program, see footnote (9) below.

[9] https://www.scfc.gov/protection/fire-prevention/wildland-urban-interface/.

Preservation of Forest Lands

Wee Tee State Forest: Acquired in January 2004, the 12,403-acre Wee Tee State Forest is located in Williamsburg and Georgetown counties. Wee Tee's bottomlands and aquatic systems furnish excellent fish and wildlife habitat and provide the citizens of South Carolina numerous recreational opportunities. Approximately 11,500 acres of the area is located in the Santee River floodplain and is subject to periodic flooding. Because of this location and the function it serves to the county, Wee Tee State Forest is considered one of the most significant tracts of land in the Santee River floodplain.

Santee River Wilderness Corridor: With financial help from The Open Space Institute (OSI) and The Nature Conservancy (TNC), three tracts of forested wetlands, totaling over 5,700 acres, were purchased along the northern bank of the Santee River in Georgetown County in December of 2021. The property contains critical habitat (including a mix of freshwater marsh, tidal forested wetlands, and upland mature pine-hardwoods) to shelter 116 priority wildlife species of conservation concern, while the river itself is home to endangered fish.[10] This conservation project now consists of the largest block of protected coastal lands in the state, which is known as the Santee River Wilderness Corridor.

scfc.gov

Prince George: Just south of the urban areas of the Waccamaw Neck portion of Georgetown County is an area known as Prince George. This property was once targeted for a massive development of approximately 3,000 dwellings, a 500-room hotel, and three (3) golf courses. The tract later sold to a conservationist in 2015 and in 2021, he granted a conservation easement to the Pee Dee Land Trust for about 1,200 acres of prime forest and wetlands. This monumental transfer marked the final chapter in a 35 year battle for lands that "need to be permanently protected."[11]

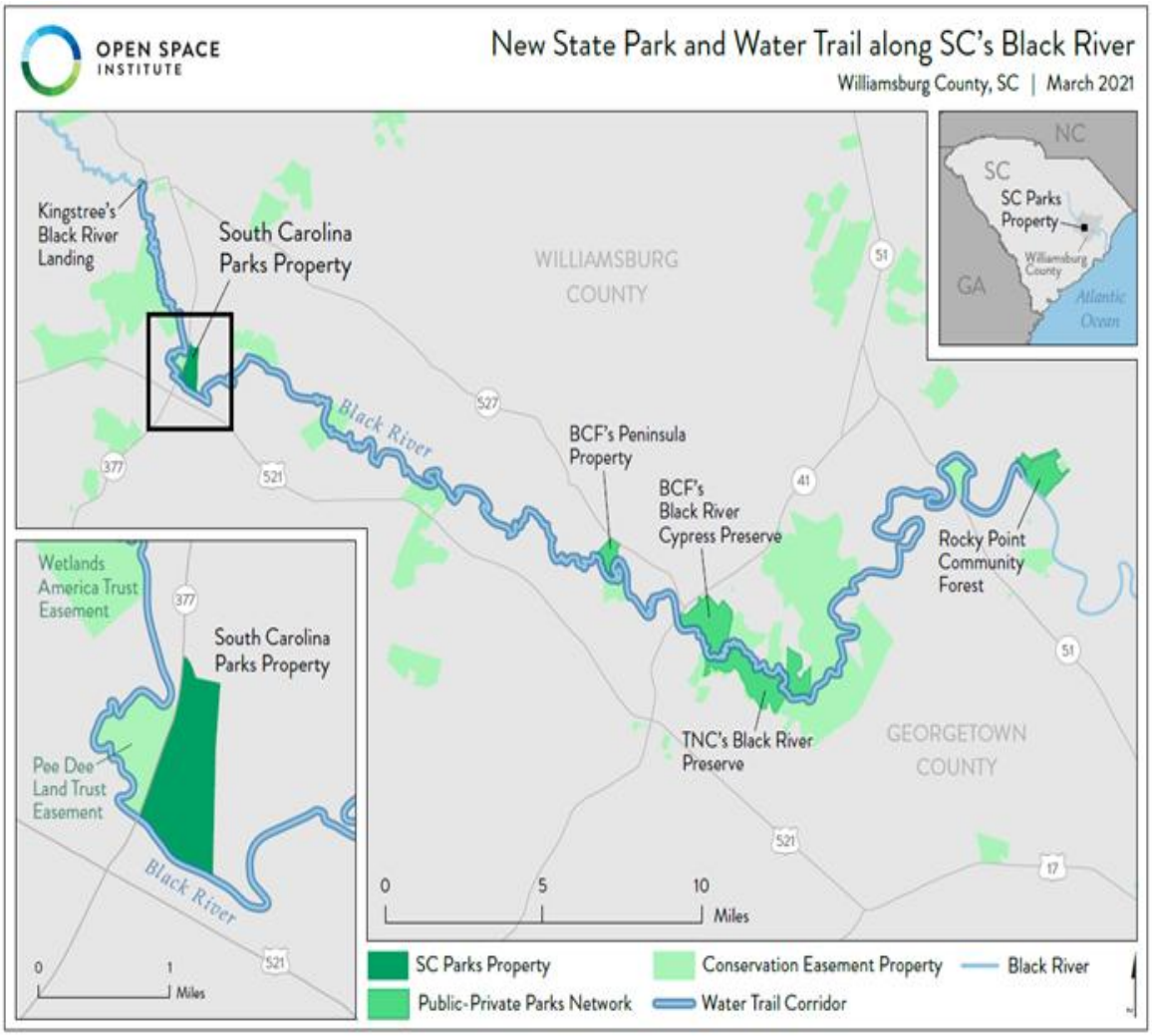
farmandranch.com

[10] https://www.openspaceinstitute.org/news/the-open-space-institute-and-the-nature-conservancy-complete-historic-acquisition-of-three-santee-river-properties.

[11] Bud Watts, PG Preservation, LLC. Article in Coastal Oberver, Tuesday, February 22, 2022.

Black River State Park: Several state and local governments, along with some non-profit organizations and community volunteers, have created a concept and started initial planning for a new water trail and linear park system along the Black River. This 70-mile network, starting at Kingstree's Black River Landing and ending at the Rocky Point

Figure 4.4



Community Forest (see Figure 4.4), will snake through Williamsburg and Georgetown Counties. The State Parks accepted a donation from the Open Space Institute for 310 acres of lands spanning along the Black River. This new state park would be the first of its kind in the state composed of a network of public and private properties.

County Ordinances and Policy

Georgetown County has a number of forested areas that are under preservation status, but is it enough? One way to ensure the preservation of valuable land in the County is to incentivize private land owners to conserve their property. The County Green Space Sales Tax Act referendum was passed by the state and went into effect on May 16, 2022. The bill provides for up to 1% sales tax, which estimates show could gain as much as $300 million statewide over a four-year span for additional preservation of open space. It can

be used to purchase land, conserve easements, and buy down density to slow and/or prevent development in certain areas. More info: https://www.scstatehouse.gov/sess124_2021-2022/bills/152.htm

Georgetown County Planning and Zoning has recently adopted updates to the landscape buffer ordinance in December 2021 and the tree ordinance in 2022. These policy improvements will help with future protection of open spaces as well as encouraging the use and conservation of native plants and trees. They will also help mitigate clear-cutting for commercial and residential development, and conserve "grand" trees. See Georgetown County Zoning Ordinance, Article XIII for all new requirements and regulations.

While the new planning and zoning regulations are making an impact, there are still more policy changes that are needed. Land owners and developers are already finding ways to circumvent these regulations, so policy needs to be revised and strengthened to add stricter enforcement and penalties. Where applicable, fees should be increased for malice violations, and tree canopy minimums should be enforced, not only on commercial development, but for all residential development as well.

Stakeholders – Forest Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
American Forest Foundation	Conserving and enhancing family forests by using innovative approaches for owners to manage both ecological and economic gains.	Nonprofit	forestfoundation.org
S.C. Forestry Commission (SCFC)	Protect, promote, enhance and nurture the forest lands of SC to achieve greatest good for citizens.	State	www.scfc.gov
Sustainable Forestry Initiative (SFI)	Balances the growing and harvesting of trees with the protection of wildlife habitat, soil, air, and water quality.	Nonprofit	www.sfiprogram.org/sustainable-forestry-initiative
International Paper (IP)	Leading producer of fiber-based packaging and pulp. Focus on sustainable and renewable resources.	Private Industry	www.ipaper.com/US
Pee Dee Land Trust (PDLT)	Conserve and promote the appreciation of natural, agricultural, and historical resources in the Pee Dee region.	Nonprofit	www.pdlandtrust.org
Clemson Univ. Extension Univ. of South Carolina	Part of the Belle W. Baruch Institute, focus is on research and education.	State/ Nonprofit	www.hobcawbarony.org/research
Green Infrastructure Center (GIC)	Assist communities in protecting and conserving ecological & cultural assets through enviro-sensitive decisions.	Nonprofit	www.gicinc.org
Trees SC	Collaboration of organizations & agencies dedicated to our state's trees.	Nonprofit	https://treessc.org

Section V
PLANT and WILDLIFE

Georgetown County has a wide variety of ecosystems, which support a wide array of species of plants and animals. Man's activities, as well as soil characteristics and natural moisture conditions, have influenced vegetative patterns. Habitat varies from dry upland ridges that have sparse plant cover to upland deciduous forest that provides a variety of food and cover for wildlife. Bottomlands afford another kind of habitat. Farm ponds, lakes, and streams provide favorable conditions for many species of fish and fowl. The southeastern part of the county includes large areas of marshland that

extend inland for many miles along the major rivers and tributaries. These marsh areas are suited for ducks, geese, and other wetland plant and wildlife.
Plant species in Georgetown County, and throughout South Carolina, are vast in numbers and types. With over 100 evergreen and deciduous trees, and numerous types of shrubs, ground layer plants, vines, ferns and grasses, the natural landscape in our region is one that needs protection and conservation. This ecosystem forms the vital habitats that support the sustainability of all plants and wildlife.

The major game species in the County include eastern cottontail rabbit, gray squirrel, white-tailed deer, wild turkey, bobwhite quail, and mourning dove. The wild turkey population is increasing because of restocking carried out by the South Carolina Department of Natural Resources. The Region also lies within the Atlantic Flyway, which accounts for the tremendous population of waterfowl in the fall and spring.


plantationserviceinc.com

State shellfish harvesting areas exist all along the coast with the North Inlet and Murrells Inlet being the most economically important shellfish harvesting areas in Georgetown County. While many of these shellfish harvesting areas are under private leases, public grounds for recreational harvesters in the County are also available. Due to discharges from oxidation ponds, treatment plants, malfunctioning septic tanks, and urban runoff, some shell fishing areas are periodically closed. This trend is becoming more and more commonplace in Murrells Inlet, the Pawleys Island inlet, and the greater Winyah Bay, and controls should be established to limit this type of contamination.

Wildlife Management

Wildlife Management Areas in the County provide open public lands to the sportsman and non-hunter alike. Public hunting and year-round recreation can be found in the scenic spots of these lands. These areas include: Santee Delta, Samworth, and the Santee Coastal Reserve Wildlife Management Areas. These areas are subject to regulations and special schedules of the South Carolina Department of Natural Resources (SCDNR). Cat Island and the southern tip of North Island are included in a heritage trust preserve known as the Yawkey Wildlife Center. These habitats help make up a total of 20,000 acres of waterfowl and wildlife protection reserves.


georgetownclimate.org

A number of federal, state, and privately held protected areas exist in Georgetown County. Private protected areas include conservation easements and foundation holdings. The borders of preserves and wildlife refuges are not impenetrable ecological barriers. Rather, they are fluid boundaries that are susceptible to the influence of outside activities. The edges of these protected areas should be buffered from land uses that would threaten the integrity and ecological function of the habitats within the reserves. These protected areas safeguard Georgetown County's natural legacy and are important areas for education and scientific research.

Table 4.3

Protected Area	Designation
Samworth Wildlife Management Area	Wildlife Management Area
Sandy Island	Preserve
Tom Yawkey Wildlife Center	Wildlife Management Area
North Inlet-Winyah Bay National Estuarine Research Reserve	National Estuarine Research Reserve
Waccamaw National Wildlife Refuge	National Wildlife Refuge
Santee Coastal Reserve Wildlife Mgmt Areas	Wildlife Management Areas
Brookgreen Gardens	Wildlife Management Area and Park
Hobcaw Barony	Wildlife Management and Research Reserve

Rare, Threatened, and Endangered Plant Species

There are numerous plants and animals that have become rare, threatened, and even endangered due to the overproduction in harvesting and hunting without proper reclamation and conservation. Table 4.4 (Appendix C) lists the plants in Georgetown County that are threatened or endangered. This includes Pondberry, Seabeach, and Yellow Pond Lilies.

At-Risk, Candidate, Endangered, and Threatened Animal Species

South Carolina is part of the Southeast Region (Region 4) of the U.S. Fish & Wildlife Service Program. The Endangered Species Program works to conserve and restore endangered and threatened species and the ecosystems upon which they depend. Before a plant or animal species can receive protection under this Endangered Species Act, it must first be place on the Federal list of endangered and threatened wildlife and plants. An "endangered" species is one that is in danger of extinction throughout all, or a significant portion of, its range. A "threatened" species is one that is likely to become endangered in the foreseeable future. Table 4.5 (Appendix C) is a listing of all the endangered and threatened animal species in Georgetown County. The Department of Natural Resource (SCDNR) also creates a list through their State Wildlife Action Plan (SWAP). A link to the SWAP can be found in the Stakeholders below.

Stakeholders – Plant and Animal Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
The Heritage Trust Program	Prevents habitat loss by protecting critical natural habitats and significant cultural sites.	State	heritagetrust.dnr.sc.gov
Marine Turtle Conservation Program	Managing and protecting sea turtles in South Carolina.	State/Local	www.dnr.sc.gov/seaturtle

SC United Turtle Enthusiasts (SCUTE)	Volunteer organization dedicated to sea turtle conservation in Georgetown.	Nonprofit	townofpawleysisland.com/scute
Marine Resources Research Institute (MRRI)	Monitors the state of the oyster and clam resources, oyster reef ecology & restoration methods.	State	www.dnr.sc.gov/marine/mrri
Waccamaw National Wildlife Refuge (NWR)	22,931 acres of coastal river ecosystems for benefit of endangered & threatened species, fish, and wildlife.	State	www.fws.gov/waccamaw
Brookgreen Gardens	Collect, conserve, and exhibit plants, animals, and cultural materials of SC.	Nonprofit	www.brookgreen.org
Hobcaw Barony	Research Reserve	Nonprofit	https://hobcawbarony.org
North Inlet-Winyah Bay National Estuarine Research Reserve (NIWBNERR)	Dedicated to conservation, research, education, and stewardship in the NI-WB estuaries.	State	http://northinlet.sc.edu/
Yawkey Wildlife Center	Committed to preserving and sustaining charitable values in conservation and wildlife.	Nonprofit	yawkeyfoundation.org/giving/conservation-wildlife/
SC DNR State Wildlife Action Plan (SWAP)	Part of a state comprehensive plan for species deemed to be in greatest need of conservation.	State	https://www.dnr.sc.gov/swap/index.html
National Fish & Wildlife Foundation (NFWF)	Dedicated to sustaining, restoring and enhancing the nation's fish, wildlife, plants and habitats.	Federal	https://www.nfwf.org/
Audubon South Carolina	Part of the National Audubon Society, this local chapter focuses on birds and protecting the habitat in which they live.	Nonprofit	sc.audubon.org

Section VI
WETLANDS

Wetlands are a special area of consideration in Georgetown County. Defined as lands that are transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water, approximately 44% of the county is considered wetlands. There are an estimated 3.8 million acres of wetlands in SC and 95% of these are found in coastal areas. These are environmentally sensitive areas, which merit special consideration for future development. In fact, the salt marshes of Murrells Inlet and Pawleys Island are two of the most imperiled wetland areas in South Carolina.

USGS.gov

Wetland Classifications – Wetlands come in many shapes and sizes, and their appearance can fluctuate depending on precipitation levels, the season, and other conditions. Some wetlands, like salt marshes, are generally obvious, but others are often mistaken as upland during dry periods. Similarly the boundaries between wetland and upland can be difficult

to identify. This is why a trained professional should be consulted for all wetland delineations.

Wetlands are often classified by professional for use in legal and permitting context (below). However, all wetlands serve similar environmental functions and offer the same values, demonstrating the need for broader protections at the County level.

- **Jurisdictional Wetlands** (wetlands subject to federal permitting) – 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. This definition of wetlands is used by the Army Corps of Engineers (ACE) and the Environmental Protection Agency (EPA) for regulatory purposes. Currently, jurisdictional wetlands are legally considered to be "waters of the United States," falling under federal jurisdiction pursuant to the Clean Water Act. Wetlands include swamps, marshes, bogs, and similar areas.
- **Non-jurisdictional Wetlands** (also called "geographically isolated wetlands") – wetlands with no apparent surface water connection to perennial rivers and streams, estuaries, or the ocean. For example, Carolina Bays are non-jurisdictional wetlands. These wetlands are the most vulnerable because they are surrounded by upland and are not legally considered to be "waters of the United States." As such, they are frequently filled or built on.
- **Other Types of Wetlands** – as defined in the SC Code of Laws, Title 48 – Environmental Protection and Conservation. Some other geographical features that can be considered wetlands include: beaches, dune systems, tidelands (mud flats or coastal wetlands), coastal zones, marine sanctuaries, and some flood plains.

Riverine wetlands are wooded swamps along rivers and streams. Figure 4.1 (Appendix B) shows the types of wetlands spatially referenced across the County. The bottomland hardwoods and cypress trees of these wetlands are nourished by a layer of water, which usually covers the surface area. Coastal wetlands consist of tidal, salt, brackish, and fresh water marshes. Because these wetlands harbor, nourish and produce a wide variety of wildlife, they are the most unique of all the wildlife habitats. The major types of coastal wetlands include the shallow fresh marshes, deep fresh marshes, open fresh water, irregularly flooded salt marshes, regularly flooded salt marshes, and bays.

The nation's largest wetland restoration program, NCRS, has protected over 62,000 acres in SC.

Wetland Functions

Flood Control and mitigation – Wetlands serve the vital ecological function of flood control and water retention during flood and rain events through hydrologic absorption and storm water flow regulation. Their topography and location allow them to capture, store, and slowly release water, providing protection for people, property, and infrastructure. Natural wetlands are more cost-effective and efficient at addressing flooding concerns than engineered stormwater infrastructure.

Storm Protection and Erosion Control – Wetlands provide natural protection from hurricanes, storm events, and erosion. Their vegetation and spongey soils stabilize waterways by reducing the velocity of water, preventing stream scour and bank escarpment. Deeply rooted wetlands vegetation stabilizes soils and protects shorelines from erosive forces like wind and water. Through their erosion control function, wetlands also help to conserve soil and water for farms and forests.

Pollution Control and Filtration – Wetlands naturally remove harmful nutrients and pollutants from environment through biological degradation and chemical oxidation. The natural friction wetlands create slows down water flows, allowing suspended sediments to settle. Nutrients from sources like fertilizers, leaking septic systems, sewage, and manure, can then be removed from the environment through vegetation uptake or microorganism absorption.

Habitat – Wetlands are some of the most biologically diverse ecosystems in the world, comparable to tropical rainforests and coral reefs in their species diversity. Wetlands provide spawning, nesting, breeding, feeding, and migration habitat for a wide variety of plants, birds, mammals, amphibians, reptiles, crustaceans, insects, and microorganisms, including rare, endangered, and threatened species.

dnr.sc.gov

Groundwater – Groundwater-connected wetlands receive and recharge groundwater, contributing to healthy aquifers and maintaining drinking water supplies for communities. A healthy range of wetlands supports overall watershed health.

Carbon Storage – Georgetown's wetlands prevent carbon from being released into the atmosphere through a process known as carbon sequestration, which helps lessen the impacts of climate change. The EPA estimates the social cost of carbon is approximately $52 per metric ton per year. While carbon sequestration rates range for an area, a measure from the Lower Waccamaw River estimates a social costs yield for carbon storage to be between $1.72 and $5.12 million per year.[12]

Education and Scientific Research – Wetlands are naturally occurring classrooms and laboratories, providing excellent opportunities for education and scientific research on a wide range of topics, including soil types, water quality, and unique species of plants and animals.

[12] Economic Benefits of South Carolina's Beaches and Barrier Islands, https://www.scseagrant.org/wp-content/uploads/Economic-Benefits-of-Beaches-Barrier-Islands.pdf SC Sea Grant Consortium.

Recreation, Tourism, and Aesthetics – Wetlands provide unique spaces for a variety of recreational activities, including hiking, boating, fishing, hunting, birdwatching, wildlife viewing, and photography.

Wetlands Restoration and Management

dnr.sc.org

Because of their vital importance to Georgetown County's water and wildlife resources, many groups are now practicing successful wetland management in order to conserve and even restore these natural wetland and riparian ecosystems. A good way to help retain these wetlands is with wetland buffer areas. This would help enhance water quality, water storage, and create new wildlife habitats (see Goal #6). Recently the U.S. Fish and Wildlife Service awarded a $1 million National Coastal Wetland Conservation grant to SCDNR. With additional contributions and matching funds totaling $895,215 from Duck's Unlimited, SCDNR, the Open Space Institute, and Audubon South Carolina, this $1.9 million wetland restoration grant will help restore 240 acres of tidal wetlands in the Lower Middleton complex at the Samworth Wildlife Management Area.[13] Restoration activities include building canals, dike and berm restoration, and waterfowl habitat enhancement.

Estuary Management and Planning

The County's salt marshes provide numerous ecosystem functions including nursery habitat for fish and crabs & nutrient filtering and cycling. Marshes protect adjacent uplands from erosion and storm damage by absorbing the dissipating wave energy and establishing a root system to stabilize sediments. Despite these benefits, marshes and estuaries continue to be threatened by land development pressure. The South Carolina Department of Health and Environmental Control – Ocean & Coastal Resource Management (SCDHEC-OCRM) has direct permitting authority within these valuable natural resource areas to limit the potential negative impacts of human activities. They are responsible for the management and enforcement of all shoreline activities in coastal and estuarine tidelands.

Carolina Bays

Carolina Bays are isolated wetlands in natural shallow, elliptical shaped depressions, which are largely fed by rain and shallow groundwater resources. The Bays are especially rich is in biodiversity, including some rare and endangered species. Habitats include many bird species, mammals, trees, and plants. Some of the Bays have been greatly modified due to farming, highway building, housing developments, and golf courses. Carvers Bay, a large one in Georgetown County was used as a bombing practice range during WWII. It has been drained and is mostly used for tree farming today.[14]

[13] https://sc.audubon.org/news/grant-awarded-wetland-restoration-georgetown-county-waterfowl-management-area. 2022.
[14] www.dnr.sc.gov/geology/Carolina-bays.html & https://en.wikipedia.org/wiki/Carolina_bays

Natural and Nature-Based Solutions (NNBS)

Living shorelines, such as oyster reefs, create vital Natural and Nature-Based Solutions (NNBS) which are a method to enhance ecosystem resilience in both natural and human-dominated systems.[15] Oysters create critical living habitats and provide essential ecosystem services including improving water clarity and quality and providing natural breakwaters. While these solutions are often considered for coastal problems such as sea level rise and flooding, riverine and urban systems can also benefit from this design, while reducing hard engineering practices like sea walls and bulkheads. When implemented correctly, NNBS can provide habitat protection, prevent wildlife loss, create greener cities, and combat issues such as extreme weather, food production, and water resource management. These solutions act to protect, sustainably manage, and restore ecosystems to promote biodiversity and human well-being. By working with existing natural systems and human-made infrastructure, NNBS can produce long-term social, economic, and environmental benefits.

Living shorelines are an effective, more natural, option for stabilizing the shoreline as opposed to walls (known as bulkheads) and rocky barriers (known as rip rap). Encouraging the growth of oysters and salt marsh, living shorelines use native vegetation and/or the installation of green infrastructure, such as oyster shells. When you construct a living shoreline, you are protecting your shoreline from erosion and promoting a land to water connection ensuring marsh migration can occur. A local example of a NNBS in the City of Georgetown is the Boyd Living Shoreline project that is currently taking place around the edges of Morgan and East Bay Park. This 3-4 year project will increase the natural shellfish populations and therefore help the site specific sedimentation rate while reducing the erosion processes around this peninsula at the mouth of the Sampit River.

Flood Studies, Flood Insurance Rate Maps (FIRMs), and the Community Rating System (CRS) Program

Studies of the flood-prone areas in the County have been made by the Federal Emergency Management Agency (FEMA) in partnership with state organizations, like SCDNR, and private consultants. These studies are compiled and help develop the Flood Insurance Rate Maps (FIRMs) for the County. The maps were revised in 2015, but because of major flooding events and several hurricanes that impacted the region between 2015 and 2019, several more revisions to the flood maps were also made, most recently on November 12, 2021. These maps and their importance to potential flooding hazards, floodplain management, and the CRS Program[16] are vital to flood loss mitigation and the protection of our natural resources. CRS discussed in more detail in the Resiliency Element.

[15] https://www.naturebasedexchange.org/about
[16] https://www.fema.gov/floodplain-management/community-rating-system.

Stakeholders – Wetland Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
US Environmental Protection Agency (EPA)	Protect human health and to safeguard the natural environment; air, water, & land.	Federal	www.epa.gov/wetlands
US Army Corp of Engineers (USACE)	Responsibility of protecting and maintaining nation's waters & wetlands.	Federal	www.sad.usace.army.mil
SC Environmental Law Project (SCELP)	Use their legal expertise to protect land, water, and communities across SC.	Nonprofit	www.scelp.org
Ocean & Coastal Resource Management (OCRM)	Protect and enhance coastal resources by preserving sensitive areas and promoting responsible development.	State	https://scdhec.gov/environment/your-water-coast/ocean-coastal-resource-management-ocrm
Keep It Green (KIG)	Local advocacy group striving to reduce development and protect the land along the Waccamaw Neck.	Local Nonprofit	www.keepitgreeninsc.com

Section VII
COASTAL RESOURCES

From beaches and natural inlets to riparian and wetland habitats, Georgetown County boasts a bountiful collection of the eastern seaboards' best natural elements. These critical areas found along the coastal waters provide for and protect many of our natural resources. There are four (4) main coastal resources that will be covered in this section.

Post & Courier.com

Beaches – The beaches of Georgetown County are all part of a system of barrier islands that help form the landscape of coastal Georgetown County. Arguably the main reason that people reside and visit this area is because of the great beaches that these barrier islands produce. From Garden City Beach on the northern end of the county, down to Cedar Island near the North Santee River delta, sandy beaches with temperate waters bring hundreds of thousands of people back annually. More information on the beach geography and public access sites are located in Section X, Scenic Areas, Parks, and Recreation Sites.

Marshes and Inlets – Sitting just landward of these barrier islands are the many tidal marshes and inlets that provide plentiful wildlife habitat, food and recreation. Obviously the Atlantic Ocean is the main source of fisheries in our region, but it is the many creeks, marshes and inlets that attract a diverse group of species, both animal and human. These marshes and inlets provide the natural habitat for recreational activities such as fishing, boating and wildlife viewing. South Carolina has hundreds of thousands of acres of coastal marshes and wetlands, allowing humans to enjoy the many cultural services that they provide, helping drive the state's economy. The total annual economic contribution of coastal tourism on the South Carolina economy is approximately $9 billion and over 99,000

thelitchfieldcompany

jobs.[17] They also provide some natural processes like hurricane buffers, floodplain management and water filtration (explained under water quality below). Table 4.6 shows the estimated economic benefits of South Carolina's beaches and barrier islands. While Georgetown County only reflects a percentage of these figures, this gives a glimpse into just how economically and socially important our region's beaches and barrier islands are.

Table 4.6

Estimated Economic Benefits of South Carolina's Beaches and Barrier Islands		
Ecosystem Services	**Avg. Estimated Economic Benefits (2019$)**	**Methodology Used**
Recreation	$2,303,646,265	Visitor Expenditures
Wetlands Protection	$388,087,972	Damage Avoided
Carbon Storage	$3,419,195	Social Cost of Carbon
Water Quality Protection	$74,813,554	Value Function Transfer
Water Supply Protection	$4,766,515	Value Function Transfer
Sea Turtle Habitat	$10,676,247	Fine Amount / Valuation

Rivers and Delta Systems – In line with the resources listed above, the county's riverine and natural delta systems are very important to the ecology of the natural habitat. The low-lying delta plain functions as a great area for human activities, fish and wildlife habitats, as well as provides a highly fertile soil and diverse vegetation. It is these deltas where a river's flow slows to spread out to create sediment-rich areas and biodiverse wetlands. The geographical feature also produces a calm and navigable water body, which is one of the main reasons the settlement of Georgetown first originated in this river/delta region.

While these coastal resources attract tourism and economic vitality, there are other factors that create a hindrance on these important natural resources. Consistent wind driven

[17] Willis, DB, Straka TJ. Bulletin FW 13. Clemson (SC): Clemson University Experiment Station; 2016. **http://www.dnr.sc.gov/economic/EconomicContributionsSC.pdf**

erosion, king tides, coastal storms, and sea level rise (SLR)[18] are threatening our coastline, inlets, and rivers. Mitigation of these risks on our natural resources is long overdue.

Stakeholders – Coastal Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
SC Department of Natural Resources (SCDNR)	Serve as the principle advocate for and steward of SC's NR.	State	www.dnr.sc.gov
SC Coastal Conservation League (SCCCL)	Protect the natural environment of SC coastal plains & enhance quality of life through balanced solutions.	Nonprofit	www.coastalconservationleague.org
-North Inlet/Winyah Bay National Estuarine Research Reserve (NIWBNERR)	Part of Hobcaw Barony, which promotes estuaries, watershed preservation, resilient coastal communities and ecosystems.	State 12,300 acre reserve	www.northinlet.sc.edu
SC Estuarine and Coastal Assessment Program (SCECAP)	A coastal monitoring program through SCNDR & SCDHEC designed to watch and report on coastal estuarine habitats.	State	www.dnr.sc.gov/marine/scecap
Institute for Marine & Coastal Sciences	Conduct research and support education that will improve the management of marine and coastal resources.	State/ Belle W. Baruch Institute	www.clemson.edu/cafls/research/baruch
Institute of Coastal Ecology and Forest Science	Conduct research and education programs focused on the ecology and management of NR for coastal SC.	State/ Belle W. Baruch Institute	www.baruch.sc.edu
Winyah Rivers Foundation	Protect, preserve, monitor, and revitalize the health of the Winyah Bay watershed.	Nonprofit	www.winyahrivers.org
South Atlantic Fishery Management Council (SAFMC)	Conservation and management of fish stocks within the federal coastal areas of the southeast.	Federal/State	www.safmc.net
Atlantic States Marine Fisheries Commission	Promote the better utilization of the fisheries, marine & shell of the Atlantic seaboard.	State Commission	www.asmfc.org
SC Oyster Restoration and Enhancement (SCORE)	Focused on the importance of oyster population, water quality, erosion control, and habitat for shellfish.	Nonprofit/ Community-Based	score.dnr.sc.gov
National Oceanic and Atmospheric Administration (NOAA)	Forecasts weather, monitors oceanic and atmospheric conditions, and manages & protects marine fisheries.	Federal	www.noaa.gov
Federal Emergency Management Agency (FEMA)	Coordinates response to disasters and provides federal funding in the form of grants and loans to mitigate such natural disasters.	Federal	www.fema.gov
The Nature Conservancy (TNC)	Protect land and water resources and stewards for food and water sustainability.	Nonprofit	www.nature.org/en-us
Open Space Institute (OPI)	A national conservation group designated to protect land, water, public recreation, wildlife habitat, and climate.	Nonprofit	www.openspaceinstitute.org
Murrells Inlet 2020	Promote conservation of the natural environment while fostering local community and commerce.	Nonprofit	murrellsinletsc.com

[18] https://coast.noaa.gov/slr/

Section VIII
SURFACE and GROUNDWATERS

Surface Water in Georgetown County is available from five (5) river sources. These are the Pee Dee, Waccamaw, Santee, Sampit, and Black Rivers. These river systems are part of the Winyah Bay Watershed that starts all the way up in southern Virginia and the Appalachian Mountains. It is recognized as the third largest watershed on the East Coast.[19]

The county has abundant quantities of ground water available from a number of principal and secondary aquifers. Principal aquifers are encountered at depths of 400 to 900 feet with secondary aquifers encountered at depths of 70 feet or less. Yields from the principal aquifers range from 150 to 900 gallons per minute (g.p.m.) and from 50 to 100 g.p.m. in the secondary aquifers. Both the principal and secondary aquifers are subject to salt water intrusion near the coast and do not contain a sufficient quantity of water to support the increased levels of concentrated development on the Waccamaw Neck.

toolkit.climate.gov

The primary source of this groundwater is the local aquifers. The main aquifer for the Waccamaw region is the Crouch-Branch Aquifer. It is generally composed of thin- to thick-bedded sands and clays deposited in marginal marine and/or lower delta plain environments. The Crouch Branch aquifer is approximately four hundred and fifty (450) feet thick in the Waccamaw area. Between 1970 and 2001, the groundwater levels in the Crouch Branch Aquifer at the GEO-077 well have declined at an approximate rate of 1.9 feet per year, with a total decline of approximately one hundred (100) feet.[20] The secondary aquifer for Georgetown is the Tertiary age Floridan Aquifer. It is only represented in the southernmost portion of the county and is about fifty (50) feet thick.

Groundwater in Georgetown County is used for various purposes throughout the community. Figure 4.1 provides the ways most groundwater is used in Georgetown and the adjacent counties. While the vast majority of groundwater is filtered and used for the potable water supply, there is an astounding amount of groundwater that is used for recreational use to keep the Strand's golf courses green and thriving. Contrary to this type of groundwater usage is the addition of non-point source groundwater pollutants from fertilizers, pesticides, and other contaminants (which is discussed in more detail under Water Quality).

[19] http://northinlet.sc.edu/about-north-inlet-winyah-bay/
[20] https://scdhec.gov/sites/default/files/media/document/Final%20Waccamaw%20GWMP_09132017.pdf

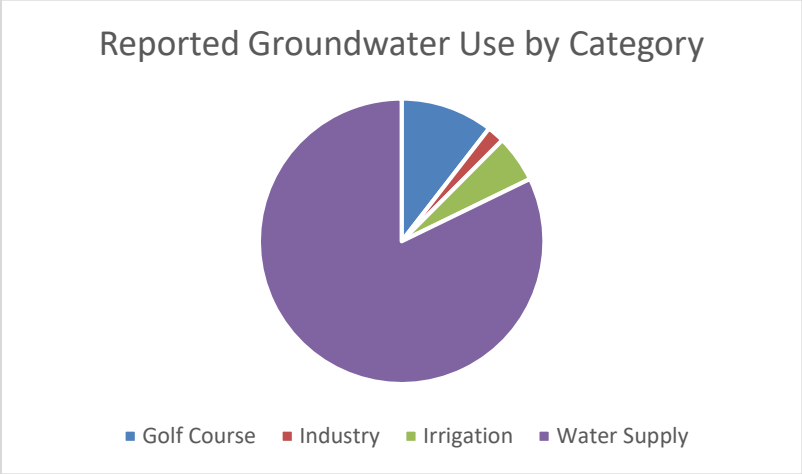


Figure 4.1

The lower Black River has some of the best quality water in the county and the Waccamaw Region, however the water suffers from low dissolved oxygen levels and organic enrichment on occasion. This is believed to be caused by the flushing of wetlands with low dissolved oxygen levels and stormwater runoff from agriculture areas upstream. Similar problems also exist for the Waccamaw River.

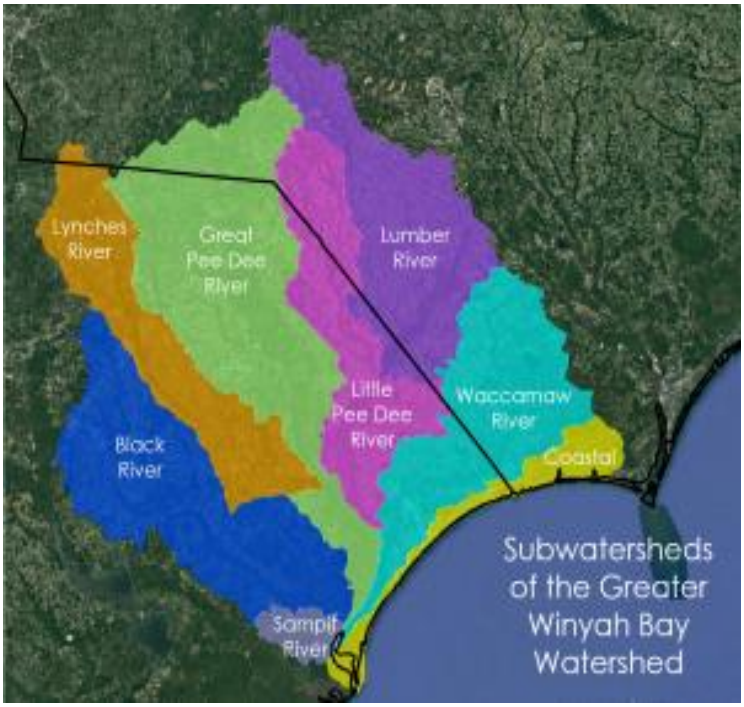
The Pee Dee River has generally good quality water, with all uses associated with its "Freshwater" classification fully supported. Examples include suitability for primary and secondary recreation, a source of drinking water after conventional treatment in accordance with DHEC requirements, fishing and the ability to support aquatic life, and for agricultural and industrial uses.

The North Inlet was reclassified by DHEC as "ORW" or "Outstanding Resource Waters" because of its significance as an outstanding ecological resource. This represents the highest classification, which may be assigned to surface waters. Ocean waters adjoining the Waccamaw Neck test well with the exception of several areas where the shellfish harvesting is conditionally prohibited after excessive rains due to polluted stormwater runoff. These estuaries are critical to maintaining our local fish and shellfish populations, as about 75% of these fisheries are spawned in estuary environments.

seegeorgetown.com

Human development generally brings several changes to the quality of water unless steps are taken to protect it. First of all, paving and building decrease surface area for water absorption, and the compaction of soil during construction decreases permeability, resulting in increased run-off. Greatly increased sediment loads are characteristic during construction activities without mandatory controls. Nutrients, oxygen-demanding materials and coliform levels in stormwater runoff from urbanized areas are greatly increased during development. These are all major problems with water quality and controls, which should be considered before development begins. Current water quality problems are notably due to the response of the rapid expansion of area development, particularly along the Waccamaw Neck, and the non-point source pollution associated with said stormwater run-off.

The Georgetown County Water and Sewer District has constructed a water treatment plant on the Waccamaw Neck that draws water from the Waccamaw River. There is also an industrial surface water intake in the county, known as the IP Canal, which is located on the Black River.



Like other counties in the region, Georgetown County's underground resources are subject to threats if not addressed adequately. These threats include septic tank failures that could leak waste material, polluted runoff, petroleum contaminants, solid waste collection sites, wastewater treatment plant spills, and industrial sources of pollution. Prudent and pro-active initiatives are needed to ensure that the condition of the County's groundwater resources are not allowed to deteriorate.

Septic Tanks – Throughout rural Georgetown County where access to a centralized sewer system is not readily available, residential septic tanks are a common method of treating wastewater. These systems have been known for failure and can result in the contamination of nearby groundwater sources, which can be a pathway for human exposure if groundwater supplies are utilized as the local drinking water supply. In fact, several stream segments within the Waccamaw region are listed as impaired, and the probable source is from failing septic systems. Communities such as Plantersville, Sandy Island, Sampit, and even Pawleys Island are listed on the DHEC's environmentally distressed communities for sewer needs.[21]

Being a coastal area, the Waccamaw region faces added environmental threats caused by these failing septic systems. Malfunctioning septic systems also release excessive amounts of nitrates and phosphates into the environment, degrading the water quality of our local streams and rivers. Installing on-site wastewater treatment systems in areas with shallow water tables and sandy soils makes the utilization of new septic systems a major cause for concern and an inflated risk on our natural resources. Consideration should be given to minimize the use of new septic systems in these areas as future development occurs.

Watersheds – Georgetown County is made up of one (1) major watershed, the Greater Winyah Bay Watershed, and eight (8) sub watersheds that direct surface and groundwater towards a major water body. While a watershed study on the Waccamaw Neck area is underway, and a County-wide watershed study is planned, a separate water quality study

[21] https://wrcog.org/wp-content/uploads/2014/08/2011-Waccamaw-Region-208-Plan-Chapters-1-6.pdf (Chapter 5, Table 5-2 on page 68) 2010.

already took place in Murrells Inlet in 2014. This study focused on addressing point and non-point source pollutants and how they affect the ecosystem, especially the shellfish harvesting areas. It also covered the risks that are associated with the contamination of such resources. See Section IX, Air and Water Quality, for more information on this detailed watershed plan.

Stakeholders – Surface and Groundwater Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
SCDHEC Bureau of Water	Protect and preserve State water resources for drinking, swimming, fishing, and other uses to benefit present and future South Carolinians.	State	https://scdhec.gov/bow
Coastal Waccamaw Stormwater Education Consortium (CWSEC)	Partners in the Horry & Georgetown region working together to protect clean water through stormwater education.	Partnership – state, university, and local communities	https://www.sccoastalinfo.org/partners/coastal-waccamaw-stormwater-education-consortium/

Section IX
AIR and WATER QUALITY

Maintaining good air quality is crucial to every aspect of community and commercial life in Georgetown County. The nature of our atmosphere, including air currents, cloud movement and the various forms in which water falls back to the land surface, make air quality and decisions affecting air quality, important issues that surpass local government authority. However, there are actions and policies that the County can incorporate which would ensure air quality responsibility at the local level and may serve as example in encouraging other jurisdictions to cooperate in evaluating and protecting the precious air resources.

The Clean Air Act (CAA) of 1970 is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and welfare and to regulate emissions of hazardous air pollutants.[22]

Particle pollution and ground-level ozone are two of the most widespread health threats. Some of these pollutants (CO, SO2, and lead) are emitted directly from a variety of sources in the air. An ambient air monitoring station was added in the City of Georgetown at Howard Adult Center to measure some of these pollutants starting around 2010 because of concerns about local industry. Since then, the concentrations on this air monitor were always below the National Ambient Air Quality Standards set by the EPA. Because the City is not considered a Metropolitan Statistical Area, and budget cuts, the air monitor was discontinued in 2019.

Most air quality issues come from man-made industry, burning fuels and biomass and of course, automobiles. But other sources of air pollution are natural, including volcanic

[22] https://www.epa.gov/laws-regulations/summary-clean-air-act

eruptions, forest fires, and haboobs (or sandstorms). The Air Quality Index (AQI) is a mechanism used by the EPA to measure the quality of the air at a given location. According to the IQair website, Georgetown had an AQI of only 18[23] on August 9, 2022 when this document was drafted. See Table 4.6 for the AQI Value Levels of Health Concerns. As the AQI increases, the population is more likely to experience increasingly adverse health effects. For example, on this same date, the AQI in Dubai, UAE was 166.[24]

Table 4-6

Air Quality Index (AQI) Values Levels of Health Concerns	
0-50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy

In accordance with the requirements of 40 Code of Federal Regulations Part 58, Subpart B, the South Carolina Department of Health and Environmental Control (SCDHEC) is responsible for tracking and monitoring our state's air quality. Annually SCDHEC's Bureau of Air Quality releases an Ambient Air Monitoring Network Plan that provides for the establishment and maintenance of an air quality surveillance system. This plan details regions across the state and help monitor the conditions which affect air quality. To research the Georgetown and Coastal regions in this report, see the 2021 AAMNP here: https://scdhec.gov/environment/your-air/ambient-air-monitoring-network

The local Waccamaw Regional Council of Governments (WRCOG) also sponsors an Air Quality Coalition, which is one of several regional environmental groups in South Carolina dedicated to improving the quality of the State's air.[25] The forum meets quarterly to discuss and address air quality concerns and ways they can help reduce air pollutants of the tri-county region. The overall goal is to work together with public and private sectors to improve air quality.

Electric Vehicles (EVs) – are a newer trend in the global fight against air quality issues. All major vehicle manufactures now sell either a fully electric vehicle or some type of hybrid that utilizes an internal combustion engine (ICE) and rechargeable battery engine for power. Recently Santee Cooper has released a new program to incentivize EV adoption by offering community project grants designed to advance EV support. These grants will be issued to local governments and businesses to help support the EV network, which will provide critical EV infrastructure, help reduce EV range anxiety, and establish our region as an EV-friendly destination. The South Carolina Energy Office has also formed an EV task force called that Electric Vehicle Stakeholder Initiative, which will facilitate a broad, collaborative statewide discussion among stakeholders to explore the opportunities to advance EV deployment in the state.[26]

[23] https://www.iqair.com/us/usa/south-carolina/georgetown. August 9, 2022
[24] https://www.iqair.com/world-air-quality-ranking. August 9, 2022
[25] https://wrcog.org/transportation-planning/air-quality-coalition/.
[26] https://energy.sc.gov/evinitiative

Water quality is another issue that impacts natural resources in Georgetown County. Discharges from oxidation ponds, treatment plants, malfunctioning septic tanks, urban runoff, and soil erosion and sediments impact the region's water quality and treatment costs. These trends are becoming more and more commonplace in Murrells Inlet, the Pawleys Island inlet, and the greater Winyah Bay, and controls should be established to limit this type of contamination. The wetlands and coastal marshes serve two very important mitigation functions for the region. The Carolina wetland regions have an ability to act like large natural sponges, absorbing and holding water, and then slowly releasing it through the canals and tributaries. As waters slowly flow from the north, they help trap and filter out sediments in the water, improving nearby water quality. These processes help our local water districts, like the Georgetown County Water and Sewer District and others, save millions of dollars in mitigation and treatment costs.

> Wetlands within SC's beaches and barrier island ecosystems are estimated to provide $4.21 - $5.33 million per year in water supply protection benefits.
> (SC Sea Grants Consortium)

Water quality is a County-wide environmental issue. The 208 Water Quality Management Program considers Winyah Bay as the #1 water quality concern in the County. As of the adopted date of this report, the Bay continues to be closed to shell fishing due to certain bacterial contaminations.[27] Similar water quality problems exist for the lower Sampit and the lower Santee Rivers as well. For a comprehensive look into local water quality management and the risks we face, visit the Waccamaw Region 208 Water Quality Management Plan here: https://wrcog.org/wp-content/uploads/2014/08/2011-Waccamaw-Region-208-Plan-Chapters-1-6.pdf

The Murrells Inlet Watershed Plan was completed in 2014 in collaboration with community stakeholders and support from both Horry and Georgetown County Councils passing resolutions for development and implementation of the plan. Community stakeholders worked to develop the plan with multiple agencies and support from the WRCOG and grant funding provided by SCDHEC under the 319 program. This plan addresses many aspects of the natural resources and ecology of this important saltwater estuary, including water quality. To view the complete watershed plan, visit: https://scdhec.gov/sites/default/files/media/document/Murrells%20Inlet%20Wtrshd%20Pln_2014.pdf

Murrells Inlet is also the only Municipal Separate Storm Sewer Systems (MS4) community in Georgetown County. MS4 is a public owned system of conveyances that include stormwater infrastructure such as catch basins, curbs, gutters, ditches, swales, pipes, culverts, and storm drains that discharge into waters of the state. Small MS4's, like the one that covers Murrells Inlet, must develop a program that covers the minimum control measures as follows:

- Public education and outreach
- Public participation/involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post-construction site runoff control
- Pollution prevention methods and good housekeeping

[27] https://sc-dhec.maps.arcgis.com/apps/webappviewer/index.html?id=f305d270358e426da4e4d9f4c1653df0. SCDHEC Shellfish Harvest Management Areas and Closures, 2022.

From more info on MS4's and the 70+ small MS4 communities around South Carolina, please visit: https://scdhec.gov/bow/stormwater/stormwater-municipal-storm-sewer-systems-ms4s

Stakeholders – Air and Water Quality Resources			
Organization Name	**Function**	**Type of Agency**	**Website**
SCDHEC Division of Air Quality Analysis	Gathers ambient data through-out state to make sure we are meeting air quality standards.	State	https://scdhec.gov/environment/air-quality
Santee Cooper	Major electric utility service for Georgetown introduces new grant program for EVs.	State	www.santeecooper.com
Georgetown County Environmental Education Center (EEC)	Educates and promotes students on important environmental issues.	County	www.georgetowncountysc.org/267/Recycling
Fuel and Energy Savings Committee	County Public Services hold monthly committee meetings to report Ozone awareness to SCDHEC.	County	www.georgetowncountysc.org/255/Public-Services
SC Sea Grants Consortium	Supports conservation of SC's coastal resources for a sustainable environment.	State, University based	www.scseagrants.org

Section X
NATURAL SCENIC AREAS, PARKS, AND RECREATIONAL SITES

This section includes natural sites and developed locations that enhance the natural features of the County. There are a number of scenes and sites in the County that generally inspire appreciation for the natural environment and resources of the area. Many of these locations are maintained and managed through the Georgetown County Parks and Recreation Department: http://www.georgetowncountysc.org/235/Parks-Recreation

Beach Access

Georgetown County contains almost thirty-five (35) miles of beautiful, Atlantic Coast beaches. Beach segments include Garden City Point (3 miles), Huntington Beach (3 miles), Litchfield (4 miles), Pawleys Island (4 miles), DeBordieu/Arcadia (5 miles), North Island (8 miles), South Island (5 miles), and Cedar Island (3 miles). Only forty (40%) percent of the County's beach area possesses general access to the public. There are currently seventy-four (74) public beach access locations in Georgetown County. While the number of public beach access points have relatively remained the same over the years, many updates to these beach accesses have taken place. Increased vehicle parking, golf cart parking, emergency vehicle ramps/accessibility, and adding restrooms and trash receptacles have been a work in progress. For geographical mapping locations of the County's beach access points, boat ramps, and many other recreational layers, please visit the Georgetown County GIS portal and add it in the Layer List here: https://georgetown.maps.arcgis.com/apps/webappviewer/index.html?id=8914e8af08b34826b2f38aac4dec476b

Boat Ramps

Georgetown offers numerous public boat and kayak launch facilities throughout the region. These landings give the public free access to the five (5) scenic rivers and Winyah Bay, which accesses the Atlantic Ocean, Intracoastal Waterway, and many inlets

and marsh areas. Figure 4.5 (Appendix D) shows all the boat launch locations on a map, and a full listing of these landings can be found in the Community Facilities element.

Recreational Sites

Other nature-based recreational and cultural areas are located all over the County. From local town playgrounds to national parks, Georgetown County has a vast array of natural and recreational sites to visit and enjoy. Some of these sites include:

- Brookgreen Gardens –
- Hobcaw Barony –
- Huntington Beach State Park –
- Yawkey Center –
- Santee Delta and Santee Coastal Reserve Wildlife Management Areas –
- Sandy Island –~~.~~
- East Bay & Morgan Parks –
- Plantation Tours –
- Indian Lake –

Descriptions and information on these areas can be found at the County Parks and Recreation website at https://www.gtcounty.org/235/Parks-Recreation, or found in our Cultural Resources element.

Scenic Rivers

The South Carolina State Scenic Rivers Program, formed out of the SC Scenic Rivers Act of 1989, is charged with conserving unique and outstanding ecological, recreational, geologic, botanical, wildlife, historical and cultural values of our state rivers. State Scenic Rivers are designated by the General Assembly after being determined eligible by the South Carolina Department of Natural Resources (SCDNR) and after local support for designation is demonstrated. The method of scenic river conservation is through a cooperative, voluntary management, which involves landowners, community interest, and the SCDNR working together for common river management and conservation goals.

Black Scenic River Project

A 75-mile segment of the Black River from County Road (#40) Bridge in Clarendon County extending southeast through Williamsburg County ending at Pea House Landing in Georgetown County was designated a State Scenic river in June 2001. This designation means that the river system offers diverse scenery, swamps, bottomland forests, coastal marshes, and historic structures. It also provides for an excellent habitat for a variety of wildlife species and migratory fish.

Great Pee Dee Scenic River Project

In 2002, the lower 70-mile segment of the Great Pee Dee was designated a State Scenic River. This designation extends from the US Highway 378 Bridge crossing between Florence and Marion Counties to the US Highway 17 Bridge at Winyah Bay in Georgetown County. The Great Pee Dee offers diverse scenery along winding water trails lined by swamps, bottomland forests, coastal marsh, and historic structures. The river floodplain and adjacent uplands contain large acreages of wild and undeveloped forestland, wetlands,

and open waters that provide excellent habitat for a variety of wildlife species; and the free-flowing, unaltered river system is an important habitat for resident and migratory fish species. These natural conditions of the Pee Dee River provide recreational boating and fishing opportunities and many other nature-based recreations that are valued by the public.

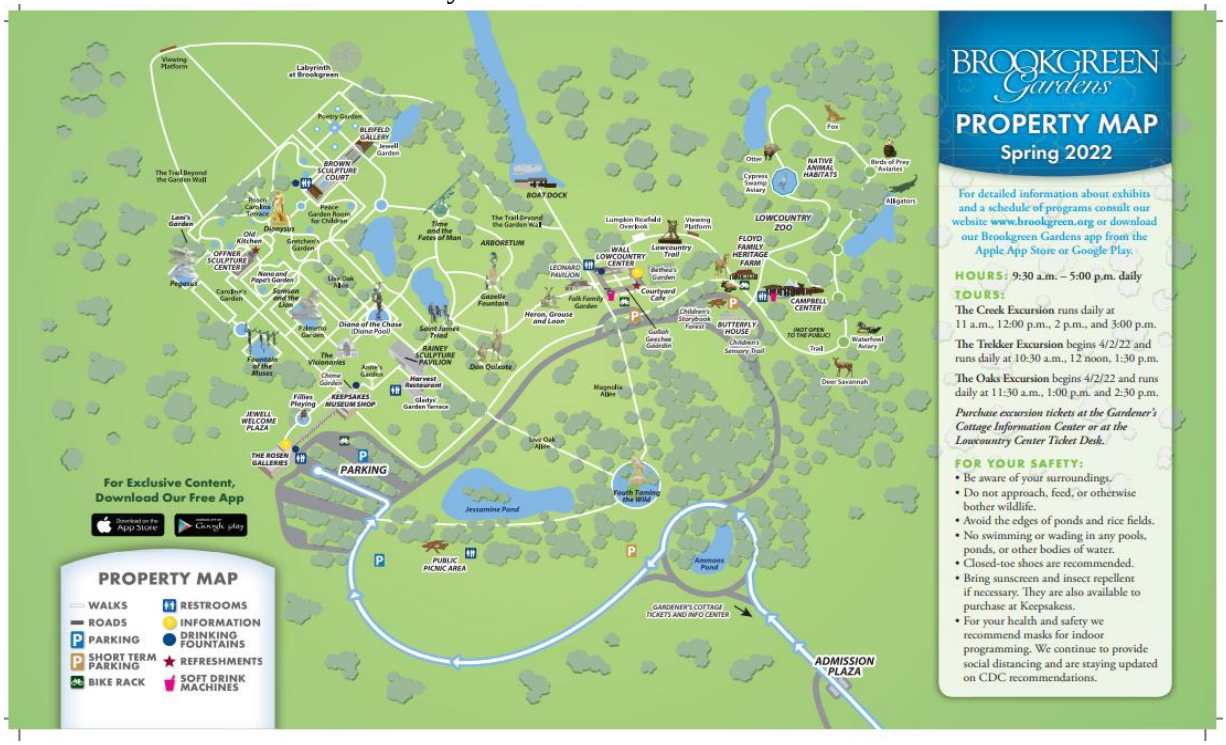
Observation Piers

Winyah Bay Fishing and Observation Pier – consists of half of the old Lafayette Bridge located off US Highway 17 and Pier Road in Georgetown. The pier is open daily from 6 am until midnight and is free of charge.
Hobcaw Point Observation Pier – located off US Highway 17 and open during daylight hours. Admission is free of charge.
Veterans Pier – a public pier, located at the south end of the Marsh Walk in Murrells Inlet and was part of a community revitalization project. Admission is free of charge.
Pawleys Island Pier – a private observation and fishing pier located on Pawleys Island. Hurricane Ian destroyed most of this pier in October 2022.

Private Commercial Nature Tours and Expeditions

There are numerous plantation tours and fishing charter trips offered throughout Georgetown County. In addition to these opportunities to view and experience the natural resources in the area, are three (3) centers that offer guided tours, but there are other tours available around the County including tours to see Winyah Bay's light house, happy hour cruise, shellfish exploring excursion, and even a pirate adventure cruise for the younger explorers. The County also offers kayak and canoe trips through Parks and Recreation.

Brookgreen Gardens offers a pontoon boat tour through the historic rice fields of old plantations and along the Waccamaw River in Georgetown County. This educational tour showcases the scenic wildlife ecosystems of the Waccamaw and the old rice fields.



Section XI
SUMMARY

The natural resources of Georgetown County and surrounding areas are vital to the economy and ecology of this region. These resources are the foundation on which we live, work, and play. From hazard mitigation and water filtration benefits, to recreation and scenic beauty, natural resources provide the tools that shape the quality of our daily lives.

Assets and Benefits of Georgetown County's Natural Resources include the following:

- The existence of open spaces and wooded areas, which provide outdoor recreational opportunities and a diversity of natural habitats in the County.
- Natural and un-developed areas, which aid in moderating the water run-off effects and flooding.
- A healthy network of natural water streams, water bodies and wetlands, which help provide and filter a sustainable water source and provide storage for floodwaters.
- Miles of public and private sandy beaches, and many navigable Scenic Rivers.
- Available groundwater resources that are suitable for residential & commercial use.

Threats and Risks to Georgetown County's Natural Resources include the following:

- Groundwater contamination and decreased water quality through point and non-point source pollution.
- Effects of salt water intrusion from sea level rise and storm surges into the region's aquifers and groundwater storage.
- Climate change causing rainfall, thunderstorm, and tropical system events to be more intense (more on this found in the Resiliency Element).
- Deterioration of recreational water resources such as beach erosion, river and saltmarsh sedimentation, and filling wetlands for development.
- Limited code enforcement due to staffing and budgetary constraints.
- Loss of wildlife, plant and animal habitats, and old growth forests due to wildfires and other contaminations.
- Increased clear-cutting practices and lack of tree canopy protection and/or buffer standards for all development.
- Loss of the natural ability to recharge or replenish groundwater sources due to the filling, destroying, and development of wetland areas.
- Lack of adequate buffers and setbacks for both fresh and saltwater wetlands.
- Loss of life and property from unregulated development practices and poor flood mitigation techniques in, and outside, the County's regulated flood hazard areas.

Section XII
GOALS, OBJECTIVES AND STRATEGIES

	Time Range Scale	
Short	Medium	Long
0-2 years	2-6 years	6-10 years

NOTE: Some of the objectives and strategies of the Goals in Section XII are aspirational and require collaboration with other agencies. These will not necessarily result in a new or updated ordinance due to constraints from the State and/or Federal governments.

Goal 1: Reduce the Level of Community-generated Stress upon Public Facilities Which Use or Affect Natural Resources.

Objectives	Strategies	Participants	Time Range
Evaluate and encourage recyclable or reusable technologies and products, including Electric Vehicles and EV infrastructure.	-Public information campaigns and promotions. -Encourage installation of electric car charging stations around the county. -Partner with the Palmetto Clean Fuels Coalition on EV grants and education. -Restrict single-use plastic bags. -Give retail, grocery, and other business establishments' ample time to adjust to the new ord. Suggested 9-12 months. -Tier in other non-recyclable and non-compostable containers.	SC Energy Office, Planning staff, County residents, Public Works	Medium
Reduce the emissions and energy consumption by the County landfill. (also see Community Facilities Element)	-Educate residents on Landfill consumption & capacity limits. -Encourage reduce, reuse, and recycle campaign within the County & PW Dept. -Increase recycling efforts across the County to limit waste going to the landfill. -Expand/improve existing recycling centers.	County residents, Public Works, Businesses,	Long
Encourage a reduction in the usage of single-occupancy vehicle trips.	-Promote ridesharing, public transit, walking/biking community, working remotely, and digital bill pay. -Facilitate walkable communities.	Planning staff, Local gov, Residents, Coast RTA, Williamsburg RTA	Medium

<u>Goal 2</u>: Make the Protection of Natural Resources a Priority in Shaping the Future Development of the County.

Objectives	**Strategies**	**Participants**	**Time Range**
Create policy for wetland & stream buffers to protect these critical habitats. (ref. 2024 Hazard Mitigation Plan, Action Item #3A)	-Add elevated wetland & stream buffer restrictions for increasing levels of development: Single-family, Multi-family, Commercial, and Industrial. -Use native species in buffer areas.	Planning staff, Stormwater Mgmt., PC, engineers, and developers	Short
Consider a comprehensive wetlands protection ordinance.	-Draft a wetlands protection and conservation ordinance that is stricter than both SCDES and USACE regulations. -Consider further restrictions on ~~all~~ development in or adjacent to ~~any~~ wetlands.	Planning staff, PC, Council, SCDES, USACE	Short
Pursue state, federal, & private grants to help attain land for greenways network and preserve environmental habitats.	- Pursue grants for mitigation through non-profits, local, state, and federal agencies based on the availability of matching funds.	State and Federal Agencies, Nonprofits, Planning staff, Finance dept.,	Long

<u>Goal 3</u>: Protect and improve water quality, including groundwater resources, for the public health, the natural environment, recreation, and the long-term public water supply.

Objectives	Strategies	Participants	Time Range
Reduce point and non-point source pollutants.	-Educate the community on the dangers contaminants from pesticide and fertilizer usage. -Ensure ordinances provide for enforcement when and where penalties are violated. -Encourage the addition of more pet waste stations throughout the County. - Consider ordinance to restrict septic-dependent development in major subdivisions with lots smaller than one acre.	USDA, County government, POA's, Parks & Rec., Nonprofits, Homeowners, CWSEC, SCDES, GCWSD	Medium
Encourage low-impact development.	-Utilize less impervious surface. -Encourage use of rain gardens in parking lots and on roof tops of commercial structures. -Encourage bio-swales and use of porous pavers or concrete. -Add requirements for natural plantings around retention ponds to absorb pollutants before infiltration into water and soils. -Review and update land development regulations for addition of "green streets" and other techniques.	Planning and Zoning staff, Stormwater Mgmt., Engineers, and Developers	Medium
Ensure the continued functional integrity of the County's waterbodies and wetlands.	-Implement recommendations from sources like the (upcoming) Georgetown County Watershed Plan, MI Watershed Plan, Waccamaw & Great Pee Dee Rivers Watershed Basin Plan, Waccamaw 208 Water Quality Mgmt Plan, etc. -Ensure protection measures of County Stormwater Ordinances are maintained. - Complete update of the Beachfront Management Plan. -Develop a Marsh Front Management Plan to compliment the Beach Front Mgmt Plan.	WRCOG, Planning staff, MI 2020, SCDNR, SCDES, SW Dept., Public Works	Long

<u>Goal 4</u>: Preserve and Enhance Unique Plant, Fish, and Wildlife Habitats in the County, and prevent or mitigate adverse impacts due to human activities.

Objectives	Strategies	Participants	Time Range
Protect endangered species and their natural habitats, before, during, and after development.	-Consider amending regulations to require BMP's for state-protected species. -Require documentation of compliance with federal regulations regarding rare, threatened, and endangered species for large-scale developments as part of preliminary reviews.	Planning staff, TNC, SCDNR, SCDES, County residents, Nonprofit groups	Medium
Strive to attain water quality that would provide for the health of open shellfish harvesting grounds.	-Develop and implement more stringent SW regulations and BMP's. -Identify and implement Watershed Protection Areas that have different SW requirements based on water quality in specific areas. -Reduce non-point source pollutants near marsh and wetland areas and enforce the reduction of said pollutants.	SCDNR, SCDES, SW Dept., Council, Planning staff, POA's.	Medium

<u>Goal 5</u>: Protect Prime Agricultural and Forest Lands in the County.

Objectives	**Strategies**	**Participants**	**Time Range**
Protect agricultural and forest lands through Zoning regulations.	-Use the Future Land Use Map place type designations to limit the rezoning of FA Zoning districts in rural areas of the County. -Discourage spot zoning of rural lands. -Propose area minimums for zoning districts. -Promote SC Arbor Day.	Planning staff, PC, developers, Timber industry, and Rural land owners	Short
Discourage urban sprawl.	-Address development regulations and zoning ordinance to add denser, smaller units, or cluster developments. -Educate public on value of conservation and cluster subdivisions. -Incentivize these developments through regulatory waivers to setback requirements, reduced parking allowances, etc. -Amend ordinances to promote conservation subdivisions in order to preserve rural agricultural and forest land, open spaces, and natural vegetation. -Help reduce the effects of urban heat islands by preserving the tree canopy.	Planning staff, PC, Developers, Private land owners, GHA, Habitat for Humanity	Medium
Continue to strengthen policy on tree removal and landscaping requirements.	-Help prevent clear-cutting of lots and promote sustainable infill development in urban areas by increased enforcement actions for unapproved tree removal. - Promote retention of tree canopy during development. -Add more regulations on residential tree removal, including consideration of longleaf pines of certain DBH.	Planning staff, PC, timber companies, developers, private land owners	Medium

<u>Goal 6</u>: Maintain the Proper Functioning of Wetlands, Watersheds, and Flood Plains in the County.

Objectives	**Strategies**	**Participants**	**Time Range**
Create protection regulations for small-scale wetland losses.	-Cooperate/communicate with state and federal agencies that monitor/maintain wetland inventories -Adopt a Wetlands Protection Ordinance.	Planning & Zoning staff, USACE, SCDES, SCELP, Land owners	Medium
Strengthen regulations on development buffers, and clear-cutting of both protected and non-protected trees.	-Amend policy/ordinances to improve retention of natural tree landscapes and buffers between non-compatible land uses.	Planning staff, PC, Council, SCELP, GIC, Other regulatory agencies, Developers	Short
Encourage the use of Natural & Nature Based Solutions (NNBS).	-Draft a policy to incentivize NNBS regulatory bonuses, such as parking reduction, roof pitch, & height allowance (in certain areas).	SCDES, DNR, Engineers, Planning staff, Developers, Conservation groups	Medium
Analyze County Zoning/Planning requirements with the guidelines and requirements of other existing County departments and outside agencies.	-Secure more robust guidelines from other regulatory agencies and apply them to County regulations; stormwater, public works, and zoning. -Review existing Land Development Regulations and Zoning requirements for conflicts with other regulations.	SCDES, DNR, FEMA, US Army Corps, Planning Staff, PC, Other regulatory agencies	Short
Protect floodplains to maintain their natural functions and to minimize damage from floods.	-Promote the cleaning, filtration, infiltration, and storage functions of floodplains and wetlands. -Continue to promote the CRS program and implement outreach & education projects.	Public education, SCDES SCDNR, FEMA, Planning staff, Building official, Insurance agents, Land owners	Long

<u>Goal 7</u>: Protect the natural and scenic beauty of the County's forests, rivers, tidal marshes, and wildlife habitats for natural, ecological, and economic benefits.

Objectives	Strategies	Participants	Time Range
Identify funding mechanisms to support and facilitate natural resource protection.	Apply for funding for sustainable natural and nature-based solution (NNBS) projects and other natural resource conservation efforts through state grants (living shorelines, greenways)	SCOR, SCP&R, SCDES, SCDNR, SCDOT, FEMA, Nature-Based Exchange	Long
Expand on the East Coast Greenway project to connect scenic pedestrian & bike paths throughout Georgetown County.	Partner with nonprofits, local municipalities, and SCDOT to connect the existing pedestrian paths & extend the Greenway wherever practicable while remaining cognizant of maintenance costs. -Review and update the current Bike/Ped plan.	City and County Planning Dept., SCDOT, Nonprofits, Regulatory agencies	Medium
Ensure the continued functional integrity of the County's rivers, streams, and wetland ecosystems & implement strategies and recommendations from County watershed studies.	-Review and consider implementation of recommendations from sources such as the Georgetown County Watershed Plan, Murrells Inlet Watershed Plan, Waccamaw & Great Pee Dee Rivers Watershed Basin Plan and the Waccamaw 208 Water Quality Management Plan.	Watershed Counties and municipalities, WRCOG, County SW Dept., Planning staff, Social groups, Other state regulatory agencies	Medium
Increase areas of open space around developed parcels.	-Incentivize and/or mandate open spaces as part of newly proposed development plans. -Also see Goal 1.3 from Land Use Element.	Planning & Zoning staff, PC, County Council	Short
Increase public access to natural resources.	-Identify areas where public access to beaches is limited. -Support efforts to create more public access points to the beaches, rivers, and inlets.	Planning and Zoning staff, Public Works, SCDOT, Town of Pawleys Island	Medium

<u>Goal 8</u>: Promote and encourage the conservation of natural habitats including, but not limited to, forest, river systems, estuaries, wetlands, and salt marshes.

Objectives	Strategies	Participants	Time Range
Works towards establishing more areas of protected land and discourage development in environmentally sensitive areas.	-Identify properties of interest. -Identify marsh/wetland migration corridors. -Utilize existing land protection programs and work with nonprofits and state agencies to preserve undeveloped areas and/or place them in conservation. -Continue to support SCDNR's state Scenic River designation. -Incentivize protection of wetland and forested areas. -Raise awareness about Conservation Easements to preserve land.	Planning staff, County Council, Nonprofits, Private land owners, Universities, State agencies, Federal agencies	Medium
Explore options to promote conservation through sales tax, grants or other funding opportunities.	-Pursue a free study through the Trust for Public Lands to develop a strategy and explore funding options for land conservation in Georgetown County. *(See also Recommendation 6 in Resiliency Element.)*	County staff, County Council,	Short

<u>Goal 9</u>: Direct new growth and sustainable development to areas and locations of the County that minimize the potential for negative impacts upon the region's greenspace ecosystem.

Objectives	Strategies	Participants	Time Range
Utilize existing infrastructure to avoid significant negative impacts from development on the natural environment.	Drive development towards or adjacent to urban areas to utilize existing water, sewer, stormwater, and electric infrastructure.	Utility Companies, City and County planning, Developers	Medium
Incentivize cluster development and smart growth.	-Reward or incentivize conservation development and open space requirements that protects the natural environment. -Review improvements to the pervious/impervious ratio for all development.	Planning staff, PC, Landowners, Developers	Long
Encourage development in other areas of the County adjacent to existing infrastructure.	-Encourage residential & non-residential development towards the periphery of urban cores to utilize existing infrastructure and utilities. -Encourage sustainable Economic Development towards southern and western portions of County where land is more plentiful and affordable.	Economic Development, Planning staff, PC, Landowners, Developers, Business partners	Short
Explore the potential for a Natural Resources Committee (or subcommittee) to review development proposals that impact the County's natural resources.	-Analyze other jurisdictions' methods for development reviews in terms of natural resources. -Explore a Resiliency and Sustainability advisory panel to review developments and their impacts on natural resources before PC meeting.	Planning staff, Regulatory agencies, County Council, Public volunteers	Medium

<u>Goal 10:</u> Promote environmental, science-based education for local decision-makers, businesses, and members of the public.

Objectives	Strategies	Participants	Time Range
Raise level of understanding and appreciation for natural resources and other environmental topics and issues.	-Continue participation in environmental trainings offered by groups such as the North Inlet/Winyah Bay NERR by staff, County Boards, County officials, design professionals, and the public. -Sponsor/hold workshop regarding County requirements as they relate to natural resources.	County staff and officials, Board members, Nonprofits, Univ, State agencies, Federal agencies	Short
Increase public awareness of the County's unique natural vegetation and habitats.	-Work with local environmental educational groups to provide a public education program to cover various topics, such as: -Natural & Nature Based Solutions (NNBS). -Planting native vegetation. -Effects of non-point source pollutants. -Sea-level rise and salt water intrusion. -Explore new software to help with the CRS program and educate public on the program's importance.	Planning staff, Public, SW Dept., Civic groups, POA's, K-12 schools, Nonprofits, Parks & Recreation, State agencies, Federal agencies	Short/ Medium
Aim to prevent forest fires and foster healthy forest ecosystems.	Participate in efforts to educate the public on the importance and benefits of prescribed burns.	Public, DNR, Parks & Rec., Civic groups, POA's	Medium

APPENDIX A

Table 4.0

Soil Association	Description
Craven - Coxville - Lenoir	Broad level area; gradients 0-6%
Capers	Level tidal flats; subject to daily salt water flooding
Norfolk - Goldsboro - Coxville	Broad; level or gently sloping area; gradients 0-2%
Lynchburg - Coxville	Broad; nearly level areas; gradients 0-2%
Bayboro - Protsmouth	Level, oval shaped depressions (Carolina Bays); subject to wetness or periodic flooding
Chastain - Chewacca	Flood Plains on Santee, Waccamaw, Great Pee Dee rivers old river channels; subject to flooding
Troup-Wagram - Rutelege	Level or gently sloping areas; gradients 0-10%
Wando - Coastal Beach	Beach areas and broad level areas around inlets; sand dunes formed naturally adjacent to the sea
Lakeland - Chipley	Broad, level or gently sloping areas, gradients 0-10%
Kershaw - Rutlege	Restricted to Sandy Island; high, nearly level or sloping areas; low level areas; gradients 0-10%
Chipley - Scranton - Rutlege	Broad nearly level or gently sloping areas; gradients 0-10%
Leon - Retlege	Broad nearly level areas; gradients 0-6%
Swamp - Fresh Water Marsh	Flat swampland along Black River and Mingo Creek

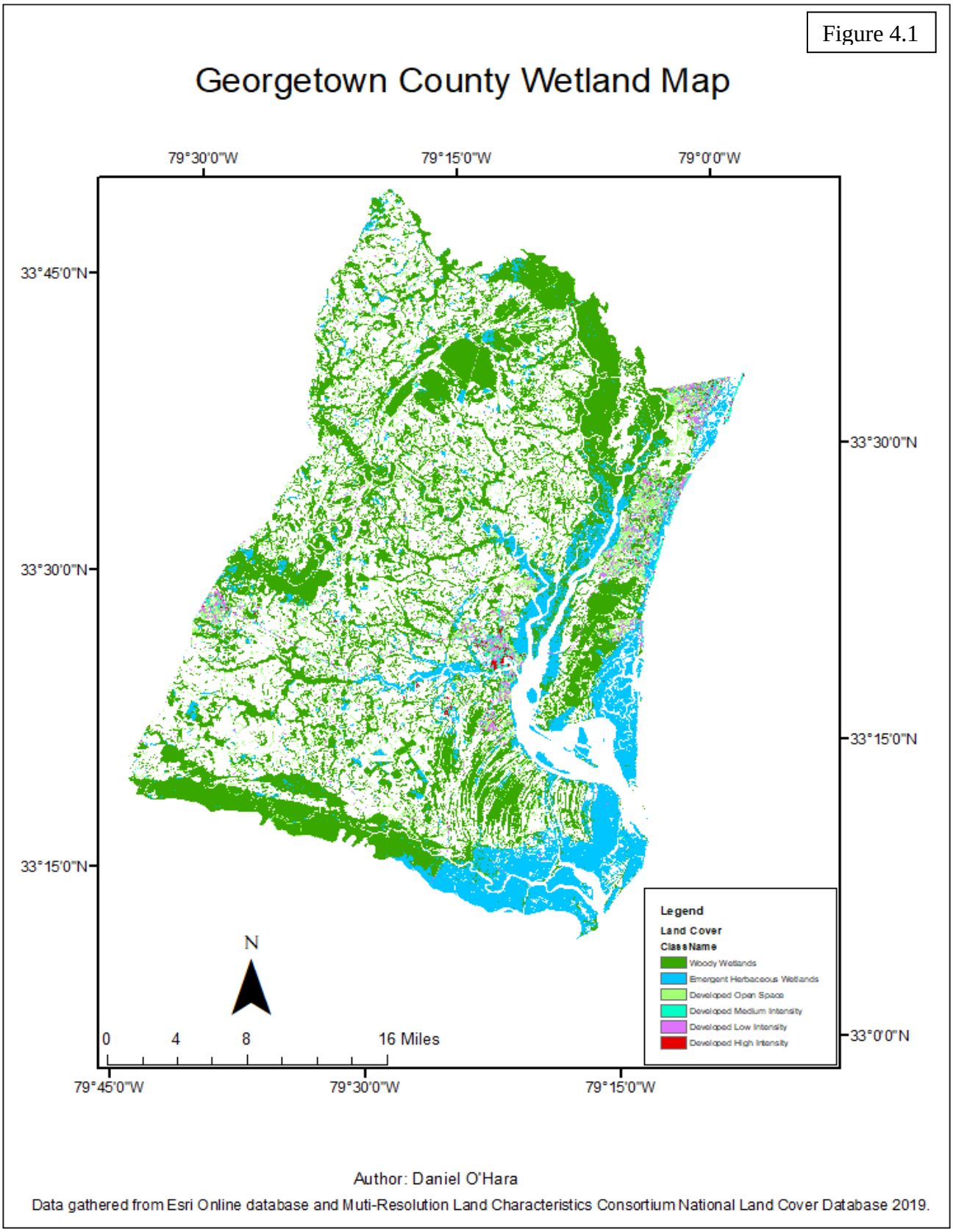
Table 4.1

Soil Name	Acres	(%)
Leon sand	18,460	3.6
Beaches	660	0.1
Yauhannah loamy fine sand	50,500	9.7
Bladen loam	51,770	9.9
Blanton sand	1,210	0.2
Bohicket silty clay loam	43,590	8.4
Cape Fear loam	19,720	3.8
Levy silty clay loam	24,110	4.6
Centenary fine sand	5,510	1.1
Chisolm sand	14,390	2.8
Wakulla fine sand	11,090	2.1
Eulonia loamy fine sand, 0 to 2 percent slopes	25,490	4.9
Eulonia loamy fine sand, 2 to 6 percent slopes	5,230	1.0
Rutlege sand	8,210	1.6
Echaw sand	11,800	2.3
Hobcaw loam	9,590	1.8
Hobonny muck	16,280	3.1
Johnston loam	13,350	2.6
Lakeland fine sand	19,110	3.7
Newhan sand	1,210	0.2
Norfolk loamy fine sand	1,540	0.3
Lynn Haven sand	7,480	1.4
Chipley fine sand	15,170	2.9
Witherbee fine sand	4,420	0.9
Chastain silty clay loam	28,740	5.5
Grifton loamy fine sand	17,500	3.4
Udorthents loamy	3,380	0.7
Wahee fine sandy loam	47,790	9.2
Yemassee loamy fine sand	33,780	6.5
Water	8,920	1.7
TOTAL	**520,000**	**100.0**

Source: Soil Survey of Georgetown County, SC: www.nrcs.usda.gov

APPENDIX B

Figure 4.1



Author: Daniel O'Hara

Data gathered from Esri Online database and Muti-Resolution Land Characteristics Consortium National Land Cover Database 2019.

APPENDIX C

Table 4.4

Category	Common Name /Status	Scientific Name	Survey Window /Time Period	Comments
Plant	Carolina-birds-in-a-nest (ARS)	Macbridea caroliniana	July-November	
	Pondberry (E)	Lindera melissifolia	February-March	
	Seabeach amaranth (T)	Amaranthus pumilus	July-October	
	Wire-leaved dropseed (ARS)	Sporobolus teretifolius	August-September	Following fire
	Yellow pond lily (ARS)	Nuphar lutea ssp. sagittifolia	April-October	

Source: https://www.fws.gov/charleston/pdf/Endangered/species_by_county/georgetown_county.pdf

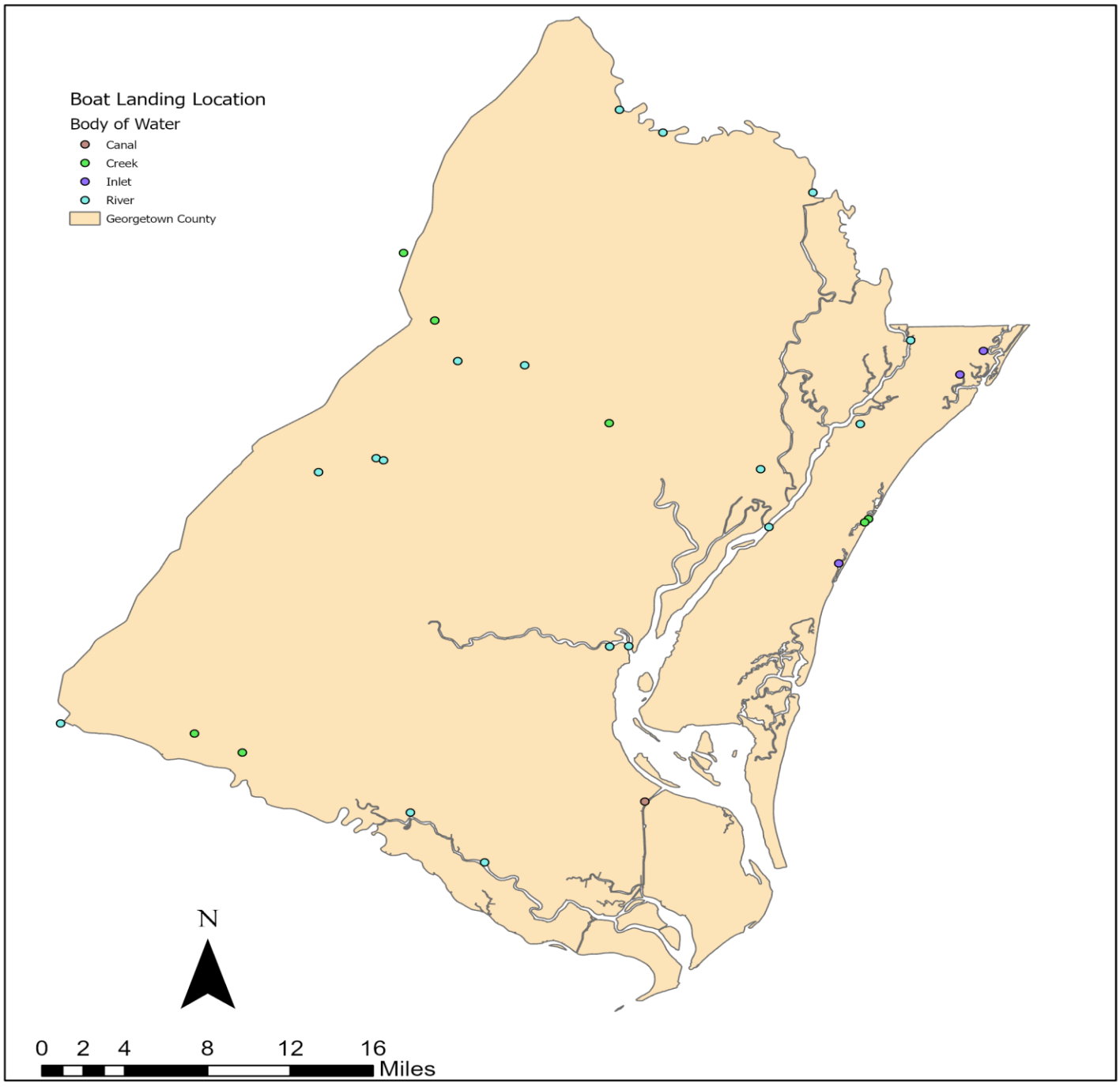
Table 4.5

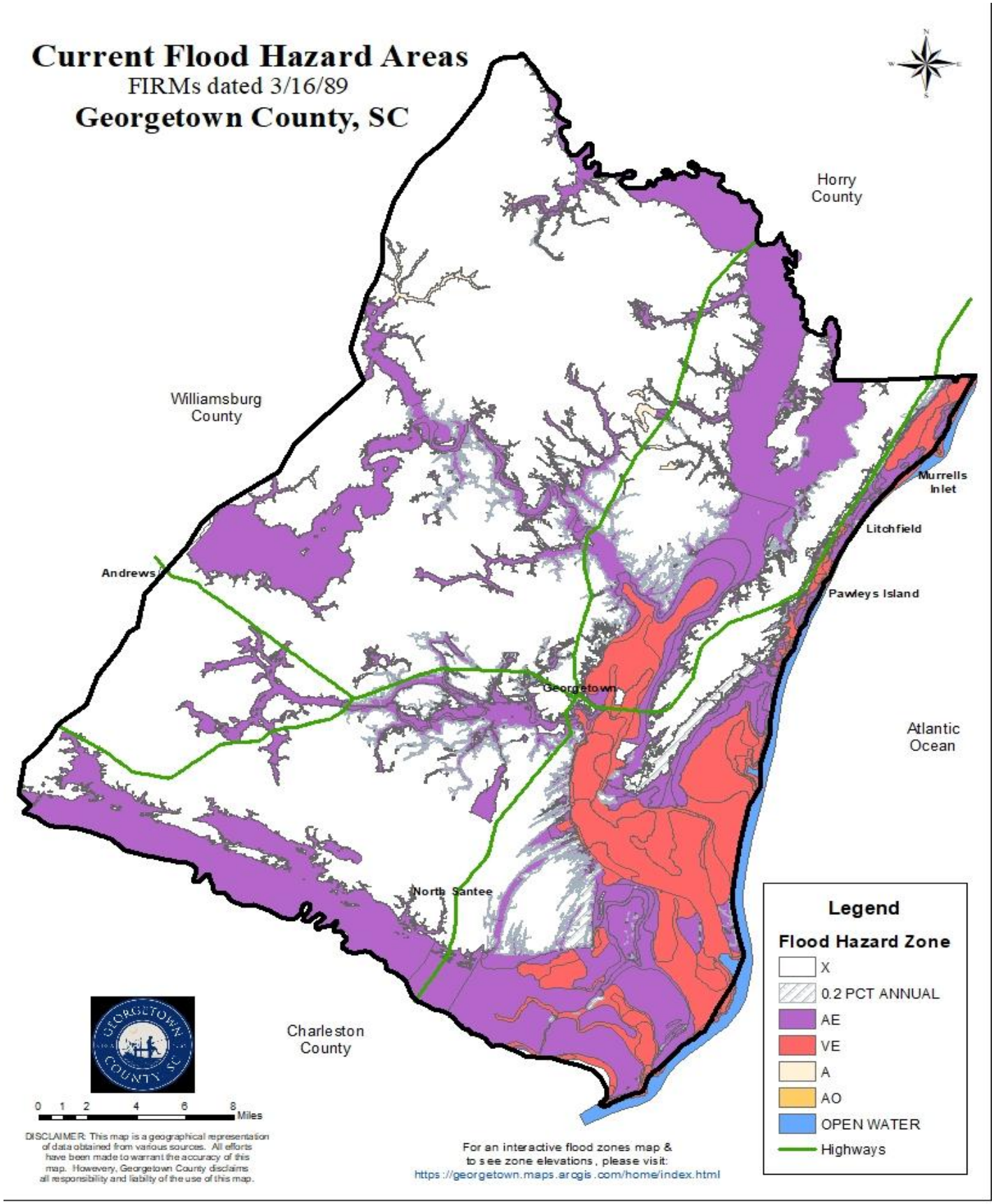
Category	Common Name /Status	Scientific Name	Survey Window /Time Period	Comments
Amphibian	**None Found**			
Bird	American wood stork (T)	Mycteria americana	Feb 15-Sept 1	Nesting season
	Bald eagle (BGEPA)	Haliaeetus leucocephalus	Oct 1-May 15	Nesting season
	Black-capped petrel (ARS)	Pterodroma hasitata	April-October	Offshore water primarily
	Eastern black rail (T)	Laterallus jamaicensis jamaicensis	April-June	Min of 5 surveys /survey point
	Piping plover (T, CH)	Charadrius melodus	July 15-May 1	Migration and wintering
	Red-cockaded woodpecker (E)	Picoides borealis	March 1-July 31	Nesting season
	Red knot (T)	Calidris canutus rufa	Aug 1-May 31	Migration and wintering
	Saltmarsh sparrow (ARS)	Ammospiza	Fall/winter	Fall/winter surveys
Fish	Atlantic sturgeon* (E)	Acipenser oxyrinchus*	Feb 1-April 30	Spawning migration
	Blueback herring* (ARS)	Alosa aestivalis*	Mid Jan-mid May	Peak: Mar-April
	Carolina pygmy sunfish (ARS)	Elassoma boehikei	Year round	
	Robust redhorse (ARS)	Moxostoma robustum	Late April-early May	Temp dependent: 16-24º C
	Shortnose sturgeon* (ARS)	Acipenser brevirostrum*	Feb 1-April 30	Spawning migration
Insect	Frosted elfin (ARS)	Callophrys irus	March-June	
	Monarch butterfly (ARS)	Danaus plexippus	Aug-Dec	Overwinter pop departs: Mar-April
Mammal	Finback whale* (E)	Balaenoptera physalus*	Nov 1-April 30	Off the coast
	Humpback whale* (E)	Megaptera novaengliae	Jan 1-March 31	Off the coast
	Right whale* (E)	Balaena glacialis	Nov 1-April 30	Off the coast
	Sei whale* (E)	Balaenoptera borealis		
	Tri-colored bat (ARS)	Perimyotis subflavus	Year round	Found in mines and caves in the winter
	West Indian manatee (T)	Trichechus manatus	May 15-Oct 15	In coastal waters
	Sperm whale* (E)	Physeter macrocephaius		
Crustacean	**None Found**			
Mollusk	**None Found**			
Reptile	Green sea turtle** (T)	Chelonia mydas**	May1-Oct 31	Nesting & hatching
	Kemp's ridley sea turtle** (E)	Lepidochelys kempii**	May1-Oct 31	In coastal waters
	Leatherback sea turtle** (E)	Dermachelys coriacea**	May1-Oct 31	Nesting & hatching
	Loggerhead sea turtle** (T, CH)	Caretta caretta**	May1-Oct 31	Nesting & hatching
	Southern hognose snake (ARS)	Heterodon simus	Most of the year	
	Spotted turtle (ARS)	Clemmys guttata	Feb-mid April	

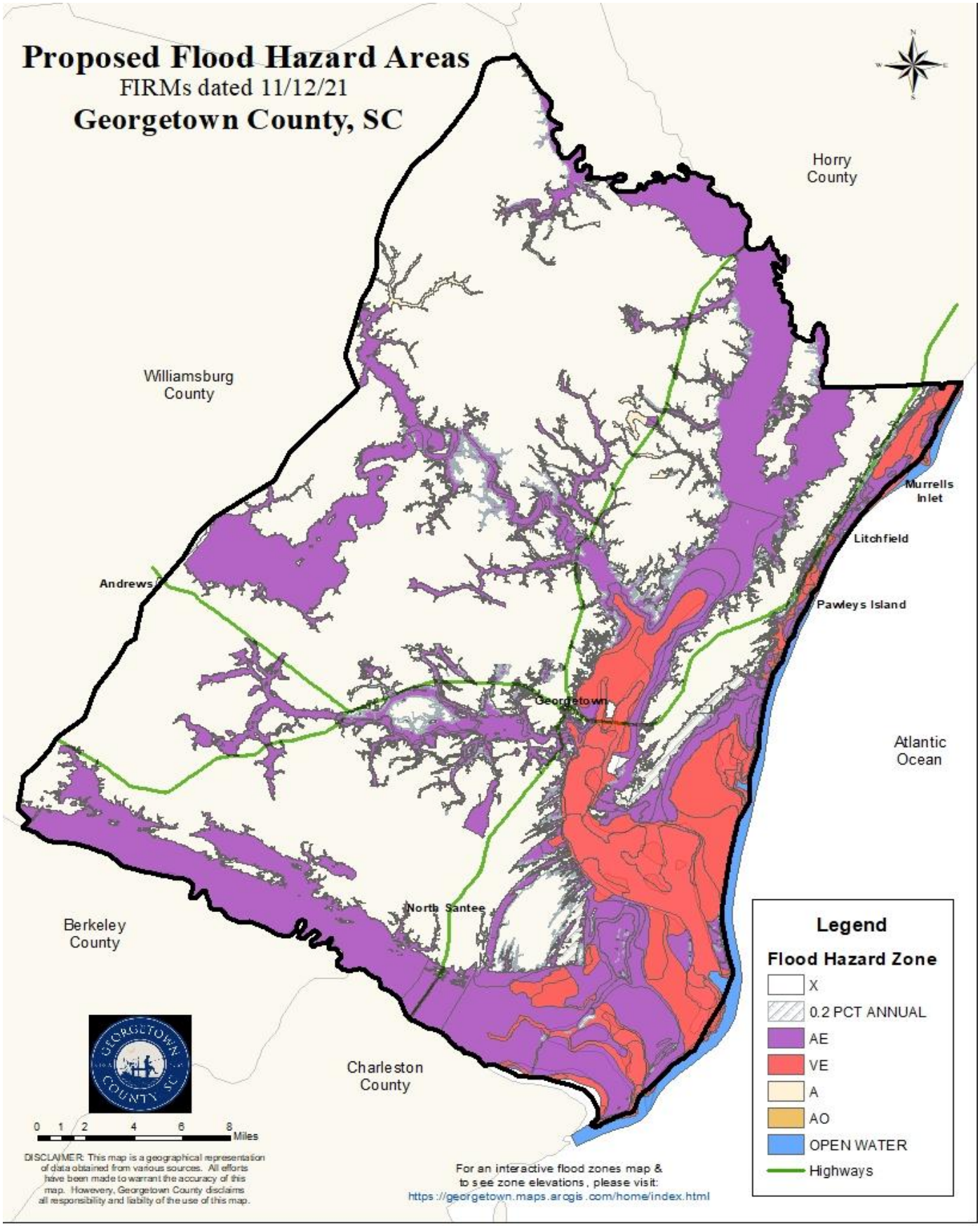
Source: SC List of At-Risk, Candidate, Endagered, and Threatened Species, 2019 https://dc.statelibrary.sc.gov

-**LEGEND** (for appendix C)-
*Contact Nation Marine Fisheries Service (NMFS) for more information on species
**The US Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS – Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued
ARS* - Species that are either former Candidate Species or are emerging conservation priority species
BGEPA – Federally protected under the Bald and Golden Eagle Protection Act
C – FWS or NMFS has on file sufficient info on biological vulnerability and threat(s) to support proposals
CH – Critical Habitat
E or T - Federally Endangered or Threatened
P or P – CH – Proposed for listing or critical habitat in the Federal Register

APPENDIX D *Figure 4.5*




Current Flood Hazard Areas
FIRMs dated 3/16/89
Georgetown County, SC
Horry County
Williamsburg County
Murrells Inlet
Litchfield
Andrews
Pawleys Island
Georgetown
Atlantic Ocean
North Santee
Charleston County
Legend
Flood Hazard Zone
X
0.2 PCT ANNUAL
AE
VE
A
AO
OPEN WATER
Highways
0 1 2 4 6 8 Miles
DISCLAIMER: This map is a geographical representation of data obtained from various sources. All efforts have been made to warrant the accuracy of this map. Howevery, Georgetown County disclaims all responsibility and liability of the use of this map.
For an interactive flood zones map & to see zone elevations, please visit:
https://georgetown.maps.arcgis.com/home/index.html


Proposed Flood Hazard Areas
FIRMs dated 11/12/21
Georgetown County, SC
Horry County
Williamsburg County
Murrells Inlet
Litchfield
Andrews
Pawleys Island
Georgetown
Atlantic Ocean
North Santee
Berkeley County
Charleston County
Legend
Flood Hazard Zone
X
0.2 PCT ANNUAL
AE
VE
A
AO
OPEN WATER
Highways
0 1 2 4 6 8 Miles
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