

Chapter 3.3 Natural Resources Element

3.3.1: OVERVIEW

Natural resources are included in this Plan because of: their significant contribution to the character and quality of life in Charleston County; their local value expressed through the public input process of this Plan; their ability to attract new residents; and because South Carolina State Law requires that a Natural Resources Element be included in the Comprehensive Plan. As a steward of natural resources, the County has a responsibility to coordinate with other jurisdictions and agencies to minimize the impacts of growth on the natural environment.

A key component in protecting natural resources is the promotion of sustainable development practices and patterns. The concept of “sustainability” involves the ability of a community and society to meet the needs of the present population while ensuring that future generations have the same or better opportunities.

There are increasing concerns that, as a culture, we are using resources at a faster rate than we are replenishing them and are creating communities that are not sustainable in the long run. Charleston County seeks to progress in a manner that conserves natural

resources and minimizes degradation of the natural environment.

One of the challenges in addressing sustainability in a community comprehensive plan is that many of the issues are global in nature – air quality, biodiversity, ozone and climate depletion, food production, and others - and it is often difficult to identify how local planning policies can address these issues. It can be overwhelming for community leaders to address these issues, particularly when the community has its hands full with local development issues. However, the County believes it is important to act responsibly through the implementation of strategies to address these issues. The County aspires to “think globally, act locally,” while also recognizing that these efforts must be balanced with other local demands on government time and resources. To supplement the strategies of this Element, the County adopted an Energy Element in 2012, which includes additional strategies to promote sustainable development practices.

Purpose and Intent

The purpose and intent of the Natural Resources Element is to: promote protection and enhancement of natural resources in the County; sustain natural environments, habitats, and wildlife for the general health, safety and welfare of current and future generations; promote sustainable development practices in conjunction with the other elements of this Plan; protect and enhance the unique natural characteristics of the County that contribute to the County’s identity and quality of life of its residents; and support the recommendations of the Charleston County Greenbelt Plan.



3.3.2: BACKGROUND AND INVENTORY OF EXISTING CONDITIONS

Numerous agencies are involved in the protection of natural resources including but not limited to the Environmental Protection Agency (EPA), the South Carolina Department of Health and Environmental Control (SCDHEC), the Department of Natural Resources (DNR), the Office of Ocean and Coastal Resource Management (OCRM), the U.S. Army Corps of Engineers (USACE), and non-profit agencies such as the Coastal Conservation League, the Sierra Club, Ducks Unlimited, the Lowcountry Open Land Trust, the Trust for Public Land, and The Nature Conservancy.

Charleston County's regulatory power regarding natural resource protection is limited to land-side issues related to the impacts of growth and development on the natural environment. For example, Charleston County can and does require larger lot sizes, lot widths, and buffers for development along the OCRM Critical Line and protects greenspace through the Charleston County Greenbelt Program. The County also is responsible for the impacts of non-point sources of pollution, or runoff, on water quality through its Stormwater Management Program, an implementation of Phase II of the Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES). In contrast, Charleston County is not responsible for permitting development activities such as docks or wetland filling or crossings; however, the County does regulate the land-side effects of these water dependent uses.

Water Resources

Charleston County has extensive water resources including the Atlantic Ocean, tidal rivers, creeks, lakes, tributaries, marshes, and freshwater wetlands. The Environmental Protection Agency, the South Carolina

Department of Health and Environmental Control, and the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) hold the main responsibilities for establishing and enforcing water quality goals through utilization of the 208 *Water Quality Management Plan*. These agencies monitor water quality to determine permit limits for treated wastewater dischargers and any other activities that may impact water quality. The U.S. Army Corps of Engineers has the authority to regulate certain activities in navigable waters and to protect freshwater wetlands. As stated above, the County has enacted regulations on land-side development activities to minimize the impact on water resources.

Floodplains are another important natural resource in Charleston County. Flooding in the County is principally due to hurricanes, tropical storms, and extra-tropical storms; however, it can also occur due to intense severe thunderstorm activity. Flooding also occurs from storm surge when storm tides are higher than the normal high tide. The Federal Emergency Management Agency (FEMA) has determined areas subject to flooding in the County.

Approximately 60 to 65 percent of the County is in a FEMA flood hazard area. Within Charleston County, the storm surge area encompasses most of the major rivers and adjoining estuarine marsh areas. Much of the remaining area that is not subject to storm surge is within the 100-year floodplain as designated by FEMA. The County's flood zones are shown on *Map 3.3.1: Charleston County Flood Hazard Zones*.

In July 2012, the United States Congress passed the *Biggert-Waters Flood Reform Act of 2012*, which mandated changes to FEMA policies, as well as the National Flood Insurance Program (NFIP). These changes most significantly impact local flood insur-

ance rates. To attempt to mitigate not only high flood insurance costs but also the impacts of future hazards due to climate change, Charleston County continuously works with local government entities to create and implement the *Charleston Regional Hazard Mitigation Plan*. The plan was originally adopted in 1999, and annual updates occur each year to ensure the plan is relevant. On November 7, 2013, the latest plan was adopted by County Council. Thirty other government entities in Charleston County have adopted the *Regional Hazard Mitigation Plan*, and this collaboration ensures that all communities within Charleston County agree to implement the strategies set forth in the plan.

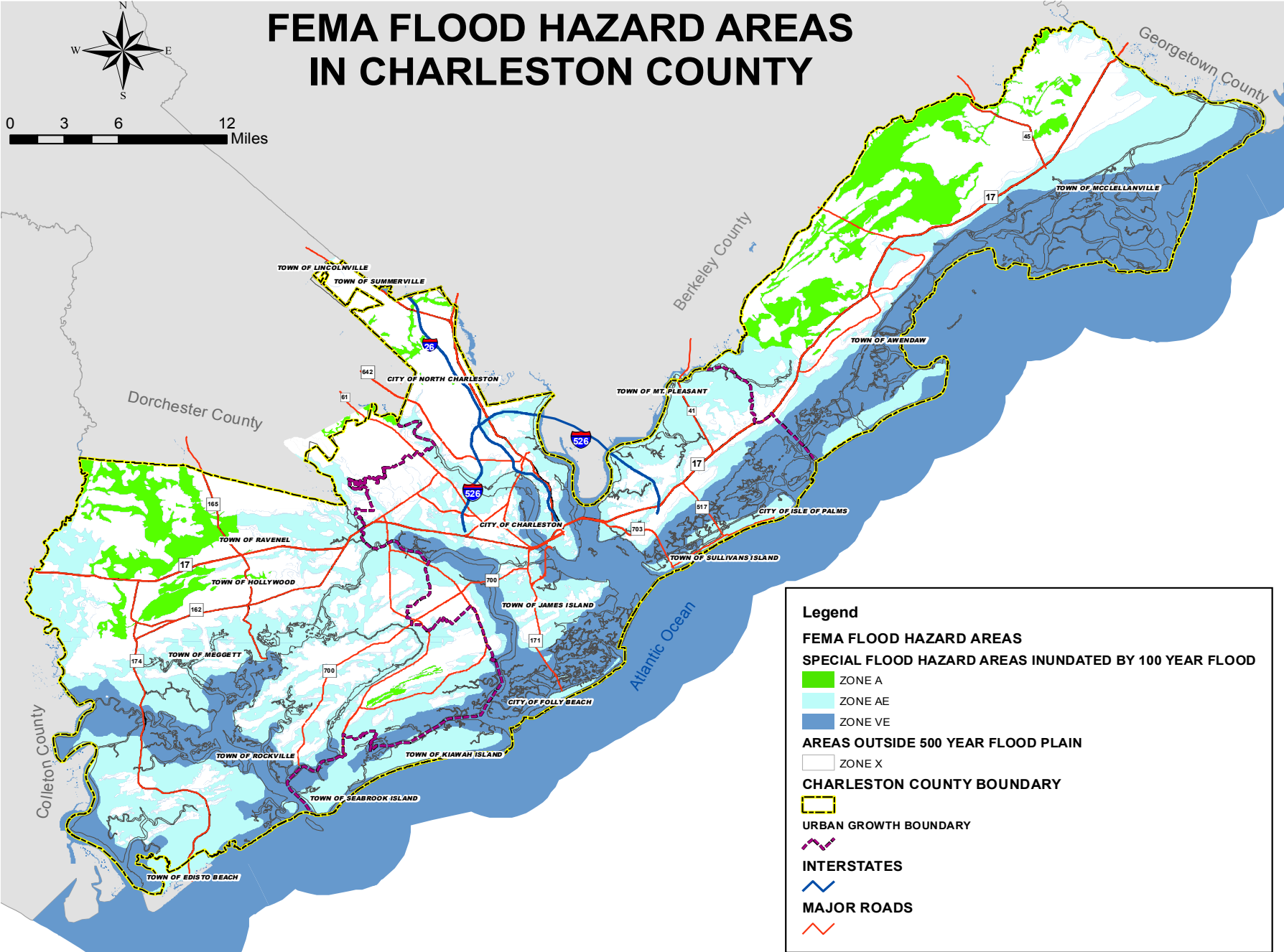
Critical Areas

SCDHEC defines "critical area" as coastal waters, tidelands, beaches, and beach/dune systems. State law mandates that SCDHEC permit all activity occurring in critical areas, which could include building docks, bulkheads, boat ramps, dredging, or filling. With the abundance of water resources in the County, several critical areas exist and permits are issued regularly. *Map 3.3.2: Office of Ocean and Coastal Resource Management Critical Area Permits* demonstrates the permits that have been issued as of March 2014. The *Charleston County Zoning and Land Development Regulations Ordinance (ZLDR)* includes waterfront development standards to protect these important areas.

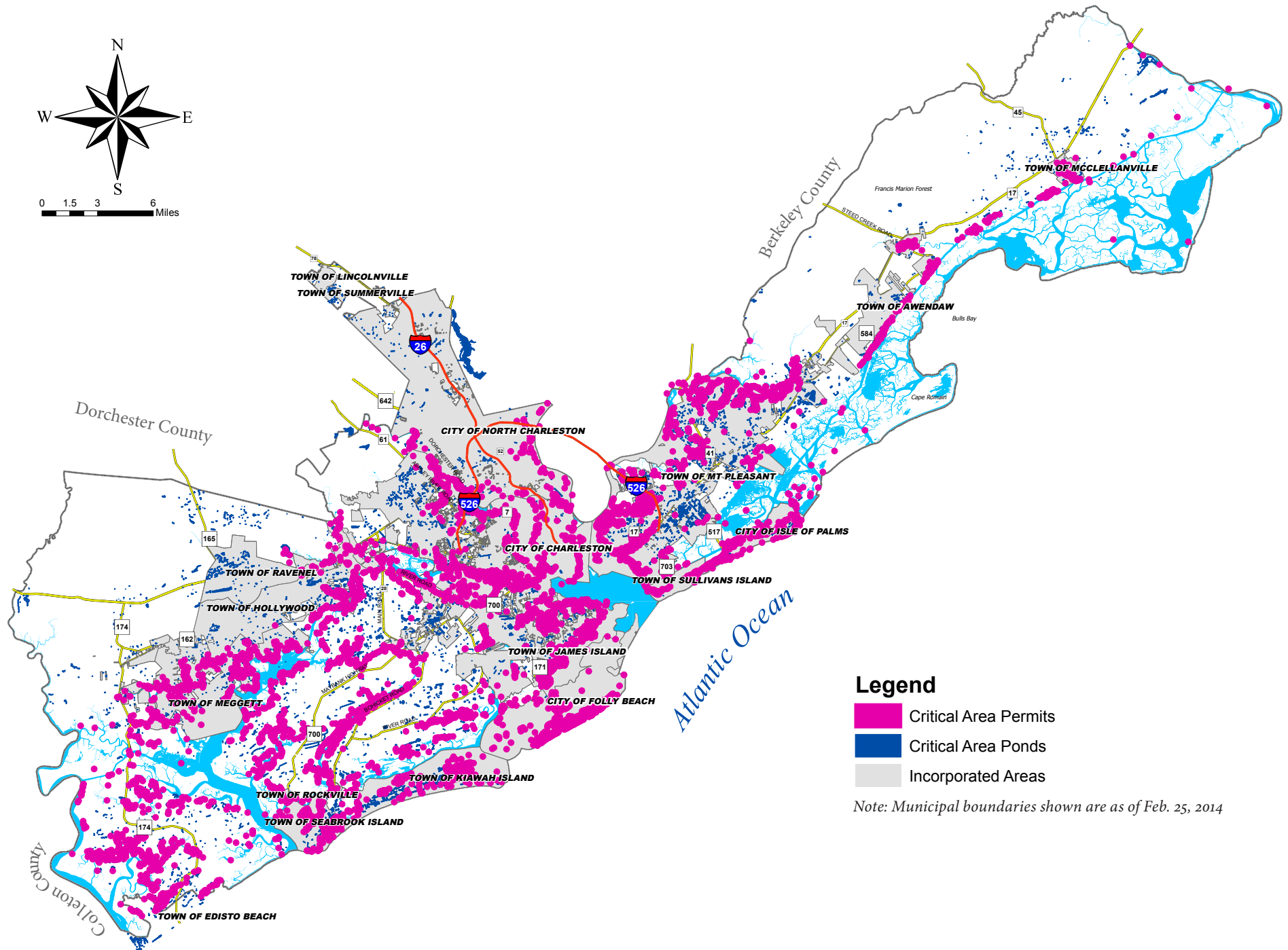
Aquatic Habitat

The aquatic habitats of Charleston County include coastal marine, estuarine, and freshwater ecosystems. The coastal marine ecosystem consists of tidal ocean beaches and sand bars, as well as coastal waters that extend seaward to the limit of low tide. The estuarine ecosystem extends from the ocean inland to the limit of tidal influence and the point where saltwater is measur-

MAP 3.3.1: CHARLESTON COUNTY FLOOD HAZARD ZONES, 2014



MAP 3.3.2: OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT CRITICAL AREA PERMITS, 2014



ably diluted by freshwater drainage. Freshwater ecosystems include swamps, bays, savannahs, floodplains, marshes, lakes, ponds, creeks, reservoirs, and rivers with certain average salinity levels.

Each of the aquatic habitats in Charleston County is characterized by unique hydrologic and water quality conditions, as well as biological communities adapted to survive and reproduce in those environments. Meandering shallow tidal creeks and salt marshes are dominant features of the estuaries of Charleston County, providing nursery habitat for many species of fish, crabs, mollusks, oysters, clams and shrimp. Pollutant loading from upland areas draining into tidal creeks is a water quality concern because these creeks function as direct conduits, receiving stormwater from the adjacent upland and conveying it to the larger estuarine system. Potentially toxic chemicals carried in stormwater also typically accumulate in bottom sediments, and depending upon the chemical conditions of the water, such as pH, salinity, or dissolved oxygen levels, can be released to cause unacceptable levels of some pollutants such as zinc, copper, lead and mercury. Malfunctioning septic tanks create another water quality concern. Fecal coliform and bacteria leaching into waterways can devastate aquatic systems and create unsafe drinking water and swimming conditions. SCDHEC gathers water quality data to develop South Carolina's 303(d) list of impaired waterbodies as required by the *Clean Water Act*. This list can be found by visiting the SCDHEC website (www.scdhec.gov). The sources for impairment of waters are identified, as well as recommended corrective actions to improve water quality. In Charleston County, the leading pollutant resulting in water impairments is fecal coliform bacteria.

There are generally three types of impacts on aquatic habitats associated with hu-

man activities: physical destruction or alteration of habitat, changes to water quality, and general disruption of normal feeding and breeding behavior caused by human disturbance. In addition to activities that affect habitat conditions, human impacts include, but are not limited to, direct harvesting of species through commercial and recreational fishing and hunting.

Terrestrial Wildlife Habitat and Designated Species

Charleston County is one of the most biologically rich and diverse habitat areas on the Atlantic Coast of the United States, containing many thousands of acres of tidal marsh and freshwater swamps. Interspersed with natural wetlands are thousands of acres of impoundments created during the nineteenth century when upland areas were altered and flooded for rice cultivation. Uplands in the eastern portion of the County are dominated by the fire-dependent Longleaf pine ecosystem - one of the most diverse ecosystems in the Country.

The wetlands and impoundments of Charleston County provide migration and wintering habitat for huge numbers of shorebirds and wading birds. The forested wetlands provide extensive breeding, migration, and wintering habitat for significant resident and migratory duck and geese populations. The region also provides important foraging and nesting habitat for a diversity of non-game species and species designated as endangered or threatened at the federal or state levels.

Farmland Soils

Productive soils generally predominate over large areas in Charleston County, providing expansive areas suitable for agriculture. At the time of the Charleston County

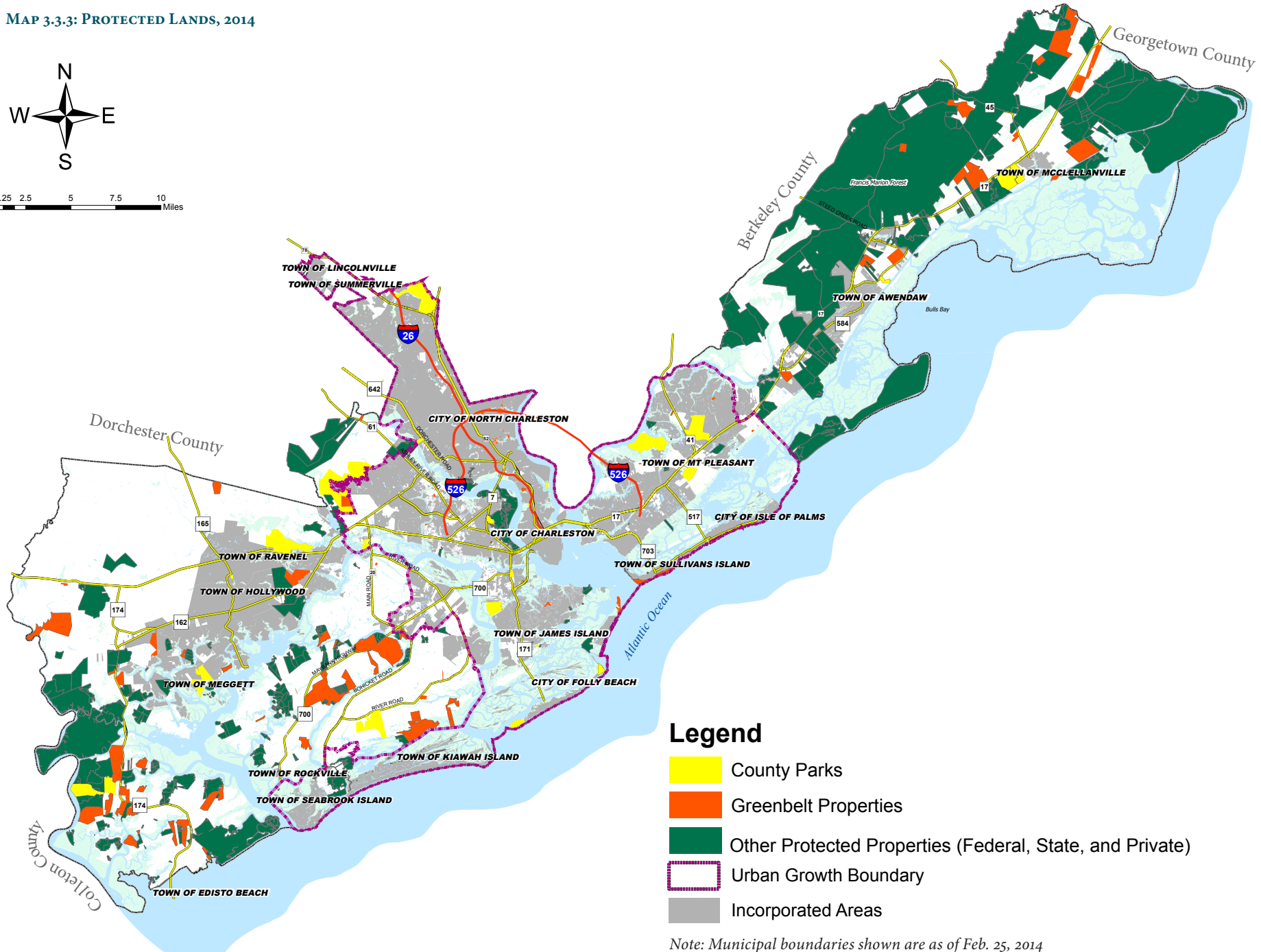
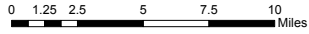
Conservation programs involving public-private partnerships and citizens in the County include:

- The Ashepoo, Combahee and Edisto (ACE) Basin Project;
- The ACE Basin National Wildlife Refuge;
- The Cooper, Ashley, Wando, and Stono (CAWS) Basin Project;
- The Santee Basin Habitat Protection Project;
- The Francis Marion National Forest;
- The Cape Romain National Wildlife Refuge;
- The Santee and Washo Coastal Reserve Wildlife Management Area;

- The Santee Delta-Cape Romain Unit of the Carolinian-South Atlantic Biosphere Reserve;
- The Edisto River Basin Project;
- The South Carolina Heritage Preserves; and
- The Charleston Harbor Project.

Public-private partnerships, along with the work of programs such as the County Greenbelt Program, ensure that land is conserved for green space and recreational purposes. *Map 3.3.3: Protected Lands* demonstrates conserved lands that are part of the County parks system, Greenbelt Program, or protected privately or by federal or state government.

MAP 3.3.3: PROTECTED LANDS, 2014



Legend

- County Parks
- Greenbelt Properties
- Other Protected Properties (Federal, State, and Private)
- Urban Growth Boundary
- Incorporated Areas

Note: Municipal boundaries shown are as of Feb. 25, 2014

Soil Survey (USDA 1971), almost three-quarters of Charleston County's land area outside of the City of Charleston (exclusive of tidal marsh) was farmland soils, categorized by the United States Department of Agriculture as prime farmland, state-wide significant soils, or unique soils.

Farm and Forest Resources

Charleston County's vision for the future clearly establishes a need to preserve and protect the community's agricultural tradition and its farm economy. The agricultural lifestyle is considered a vital element of the community's rural character and historic heritage. Today, this lifestyle and the rural countryside that supports it in Charleston County are threatened by a number of forces. The County is losing irreplaceable agricultural resources to urban sprawl at an alarming rate, with much of the new development in the County since 1982 occurring on prime farmland previously used by many generations of farmers for production of crops and livestock.

With the adoption of the 1999 *Comprehensive Plan* and subsequent updates, the County has shifted significant focus on the preservation of farmland resources both through the land use plan recommendations and the current *Zoning and Land Development Regulations Ordinance*. Agriculture and timbering activities have also been reinforced through the provision of preferential tax assessments for such activities.

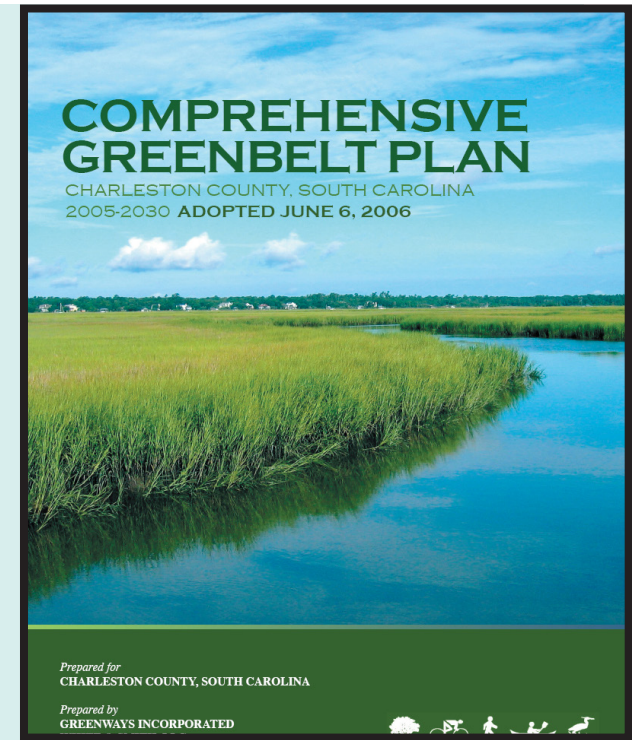
While the County has done much to manage growth through this Plan, the conversion of farmland to residential use still increases pressures on the farming community, not merely by taking land out of production but by creating a perception of rising property values for uses other than agriculture. With development, and the gradual dispersal of population into the suburbs and rural areas, come conflicts between farming activities and the interests of new residents unhappy with the noise, dust, and smells of routine farm activities. As farms are sold and converted, the remaining operations become separated by new development. Additionally, as the farming community shrinks, so does its local political voice,

and the chances increase that local planning and zoning decisions can be incompatible with agricultural activities.

However, sustainability initiatives, rising energy costs, and climate change predictions have resulted in a return to more local production of agricultural products. With its climate, quality soils, and access to the unique resources of the coastal environment, Charleston County has witnessed a renaissance of agricultural production, particularly in the fields of viticulture, organic farming, artisanal meat and cheese production, and other niche markets that are supported by the sustainability movement of thinking globally and buying locally. Several organizations exist in Charleston County that focus on access and production of local food.

Other issues affecting the agricultural economy include rising land values that adversely affect the viability of farming by making it increasingly difficult for new farmers to enter agriculture or for existing producers to buy or rent land to expand operations. Additionally, state and federal inheritance taxes make it extremely difficult for farming families to transfer ownership of the family farm from one generation to the next, particularly in locations where land has acquired significant value due to its development potential.

Charleston County also has extensive forest resources that benefit the County's economy, its natural resource base, and its rural character. A portion of the Francis Marion National Forest is within the County, and this immense natural resource is beneficial to the County in a variety of ways from enhancing the quality of life and providing recreational opportunities to preserving a unique ecosystem that has been present for hundreds of years in the Lowcountry. The manner in which forest land is managed has a direct influence on water quality, the way wetlands function, wildlife habitat, air quality, and scenic resources, as well as the land's long-term productive capabilities. In 2012, the Francis Marion National Forest began updating their *National Forest Land and Resource Management Plan* to comply with



Note: The 2006 *Charleston County Comprehensive Greenbelt Plan* is incorporated into this *Comprehensive Plan*.

recent changes in federal regulations. This plan revision includes several community workshops and incorporates strategies to address challenges facing National Forests such as forest restoration, watershed and habitat protection, and effects of climate change, among other issues. A number of initiatives and state programs are in place in South Carolina today that encourage forest stewardship and the long-term sustainability of forest resources.

Charleston County Council, recognizing the importance and plight of agriculture and forestry, established the Agricultural Issues Advisory Committee (the Committee) in November 2009. The Committee is a joint effort of municipal, county, state, and federal governmental agencies, non-profit organizations, and private sector agricultural and forestry operations whose mission is to identify ways to foster agriculture and agri-business in both Charleston County and across the state. The Committee is an extremely effective advocate for preservation of agriculture and forestry in South Carolina, facilitating the flow of information and ideas between farmers, foresters, non-profit groups, private entities, government agencies,



and elected and appointed officials; bringing together agricultural preservation efforts from around the state; and providing links between local producers and consumers.

In November 2011, the Town of Mount Pleasant, in partnership with the Appalachian Sustainable Agriculture Project (ASAP), completed a *Local Food and Farm Assessment*, which provided insight on the importance of agriculture in Charleston County. *Reference Box 3.3.1* summarizes this study. Continued attention to the importance of agriculture to Charleston County's economy and history will help ensure that this sector of the local economy is preserved and enhanced for years to come.

Groundwater Resources

Many residents and businesses of Charleston County and neighboring Dorchester and Berkeley Counties are and will be dependent upon groundwater to meet their water needs. Mount Pleasant Water Works relies in large part on water drawn from wells to meet the potable water needs of its residents. In the Rural Area, residents are completely dependent upon individual wells to provide for their water needs. As demand for groundwater grows in coming years, users will be forced to compete for a shrinking portion of the groundwater resource. Because the groundwater resources are part of a much larger interrelated system of aquifers underlying 28 counties from Columbia to the coast, planning for use and protection of groundwater resources is an issue that must be addressed collectively by many communities in the State. Both the South Carolina Department of Health and Environmental Control and the South Carolina Department of Natural Resources (SCDNR) are involved in the development of a coordinated groundwater protection program. The BCDCOG is the agency designated to coordinate a groundwater management Plan for the

Reference Box 3.3.1: Local Food and Farm Assessment (2011)

In 2011, the Town of Mount Pleasant consulted with the Appalachian Sustainable Agriculture Project (ASAP) to provide a Local Food and Farm Assessment. The study resulted in an emphasis on the relevance of the agriculture and timber industries across Charleston County.

According to the 2012 USDA Census of Agriculture, the County has **359 farms** and **nearly 35,436 acres of farmland**. The average farm size is 99 acres. Using 2007 data, the Assessment determined the value of agricultural products sold from Charleston County farms was approximately **\$24 million**. Charleston is the number one aquaculture (farming of fish, crustaceans, mollusks, etc.) producer in the state. A comparison of 2007 and 2012 data indicates that the number of farms increased however, the total acres of farmland decreased.

To understand the food market, ASAP consulted market research, restaurants, and grocers; all research indicated that locally grown food has more appeal with customers. Survey results from County residents indicate that there is strong support for having locally grown food available for purchase, conserving the region's farmland, and enjoying the recreational aspects associated with agriculture.

The report includes policy recommendations, many of which the County already practices including tax incentives for agricultural uses and creating an agricultural preservation board. Additional recommendations include promoting agri-tourism, creating a comprehensive farmland plan, and creating new zoning districts or regulations that encourage agriculture or urban gardening.

To read the complete report, please visit www.tompssc.com.

Berkeley-Charleston-Dorchester Region. A coordinated effort is needed to ensure that the quantity and quality of our groundwater resources is protected.

Air Quality

Air quality is monitored and regulated by several agencies including the U.S. Environmental Protection Agency (EPA) and the SCDHEC Bureau of Air Quality (BAQ). The *Clean Air Act*, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment.

The *Clean Air Act* established two types of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment and damage to animals, crops, vegetation, and buildings. EPA has set NAAQS for six principal pollutants, which are called “criteria” pollutants. The *Clean Air Act* requires EPA to review scientific information and standards for each pollutant every five years. In 2008, EPA set new standards for ozone pollution, called primary 8-hour ozone standards, that reflect new scientific evidence regarding ozone and its effects on public health and the environment. The new standards set the ozone limit at a maximum of 0.075 parts per million¹.

The BAQ is responsible for the conservation and enhancement of air resources in South Carolina in accordance with regulations pursuant to the *Pollution Control Act*, the *Asbestos Licensing Act*, and the *Clean Air Act*. The EPA and the BAQ have implemented an air quality monitoring program throughout South Carolina that measures concentrations of major pollutants in the

¹ Information obtained from EPA.

ambient air. The effectiveness of the State’s air quality program is measured in part by the rate of compliance with applicable statutes and regulations, and in part by the State’s attainment status for the NAAQS.

From 1999 to 2008, Charleston County experienced a degradation of air quality; however, from 2008 to 2012, the ozone level improved from 0.074 parts per million to 0.065 parts per million. In 2008, when the County had an ozone level of 0.074 parts per million, this was extremely close to the EPA limit of 0.075 parts per million. Nonattainment of NAAQS has serious implications including:

- Public health impacts such as asthmas and lung issues;
- New stringent air pollution control regulatory standards such as requirements to develop traffic restrictions to reduce nitrogen oxides and volatile organic compounds from automobiles, mandated use of low sulfur fuels, carpooling or busing requirements, and reduced driving days (failure to comply with such regulations can result in withholding of federal highway construction funds); and
- Impacts to industry and economic development due to required air pollution controls resulting in increased costs for goods and/or reduced employment opportunities.

The improved ozone level in 2012 could have resulted from the *Early Action Plan* (EAP), a collaboration of the County, BCDCOG, SCDHEC, and EPA. The EAP was created in 2004, and it determines what actions must be taken at state and local levels to ensure compliance with recently adopted federal regulations regarding ozone emissions. The EAP contains a “List of Emission Reduction Strategies” that facilitate the

County’s efforts to reduce harmful emissions through a series of suggested actions items.²

² Information obtained from BCDCOG.

3.3.3: NATURAL RESOURCES ELEMENT GOAL

Unique Lowcountry natural resources, such as rivers, creeks, wetlands, aquatic and wildlife habitat, beaches and dunes, groundwater, forests, farmland soils, and air quality will be preserved, and actions will be taken to mitigate any potential negative impacts of growth and development, and enhanced, where appropriate.

Natural Resources Element Needs

Natural Resources Element needs include, but are not limited to, the following:

- Protecting and enhancing natural resources;
- Sustaining natural environments, habitats and wildlife;
- Promoting sustainable development practices;
- Promoting and protecting scenic corridors; and
- Allowing compact land use patterns to help minimize the fragmentation of natural resources.

3.3.4: NATURAL RESOURCES ELEMENT STRATEGIES AND TIME FRAMES

The following strategic actions should be undertaken by Charleston County and cooperating agencies that promote and protect natural resources in the County. These implementation strategies will be reviewed a minimum of every five years and updated every ten years from the date of adoption of this Plan.

- NR 1. Maintain the *Zoning and Land Development Regulations Ordinance* to ensure that natural resources are protected prior to, during, and after development activities.
- NR 2. Continue protecting critical and natural resource areas by designating them for very low intensity uses in the future land use recommendations and the *Zoning and Land Development Regulations Ordinance*.
- NR 3. Promote sustainable, low impact development practices including but not limited to stormwater management, maintenance of vegetative cover, Critical Line buffers and setbacks, and conservation set-asides in development plans and the *Zoning and Land Development Regulations Ordinance*.
- NR 4. Promote sustainable development patterns by concentrating high intensity development in the Urban/Suburban Area where public facilities and infrastructure exist and encouraging low intensity development in the Rural Area to protect sensitive and unique natural resources.
- NR 5. Work with the Charleston County Greenbelt Program and participating non-profit agencies to implement the *Comprehensive Greenbelt Plan* and provide incentives for protection of natural resources using methods such as conservation easements to place land into permanent protection and provide development incentives such as density bonuses for land set-asides through land development regulations.
- NR 6. Explore the feasibility of establishing a public/private/multi-jurisdictional transfer of development rights program.
- NR 7. Investigate the *Firewise guidelines* and *Wild Land Interface Building Code* and use these tools to evaluate the *Zoning and Land Development Regulations Ordinance* for possible amendments to incorporate standards to protect rural residents from the danger of wildfires.
- NR 8. Continue to promote best management practices, including prescribed burning where appropriate, in forest maintenance, timber harvesting and agricultural production.
- NR 9. Continue to support local agricultural and timber operations through incentives such as tax relief initiatives to owners who keep their property in agricultural or timber production and voluntary agricultural and forestal areas/communities.
- NR 10. Continue protecting water quality through implementation of the NPDES Phase II Stormwater Management Program.
- NR 11. Work with applicable jurisdictions in the region, the BCDCOG and SCDHEC to adopt and implement a regional groundwater management plan.
- NR 12. Encourage sustainable landscaping that includes attractive environments that are in balance with the local climate and require minimal use of fertilizers and pesticides, while at the same time conserving water.
- NR 13. Adopt innovative planning and zoning techniques such as Form-Based Zoning and Multiple-Use Overlay Zoning District regulations to authorize the combination of land uses in compact development patterns.
- NR 14. Continue the efforts of the Charleston County Council Agricultural Issues Advisory Committee to identify ways to foster agriculture, agri-business, and forestry in the County and across South Carolina including but not limited to supporting state and local enabling legislation such as the Tourist Oriented Directional Signage Program and voluntary agricultural and forestal areas/communities.

- NR 15. Administer and implement the *Charleston County Local Comprehensive Beach Management Plan* as approved by Charleston County Council (through adoption of this Plan) and SC DHEC-OCRM.
- NR 16. As recommended in the *Charleston Regional Hazard Mitigation Plan*, prepare and adopt a county-wide Community Wildfire Protection Plan (CWPP) with the assistance of local and locally represented land management agencies and organizations and local hazard mitigation officials, including fire departments.
- NR 17. Investigate programs such as Septic Maintenance Programs to protect water quality and provide clean and safe sewage systems to communities in the Rural Area.
- NR 18. Support agriculture and agribusiness by: (1) recognizing these operations as the important economic engines they are; and (2) completing a detailed food and farm assessment that maps the local food shed and the farmland required to support it and that makes recommendations regarding planning for a more resilient food supply by protecting adequate land and farms in the surrounding region.
- NR 19. Continue to coordinate with the BCDCOG, SCDHEC, and other jurisdictions and agencies to implement the *Early Action Plan* and its Emission Reduction Strategies and continue working to meet federal air quality standards.

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