



Santee-Lynches Regional Green Infrastructure Plan

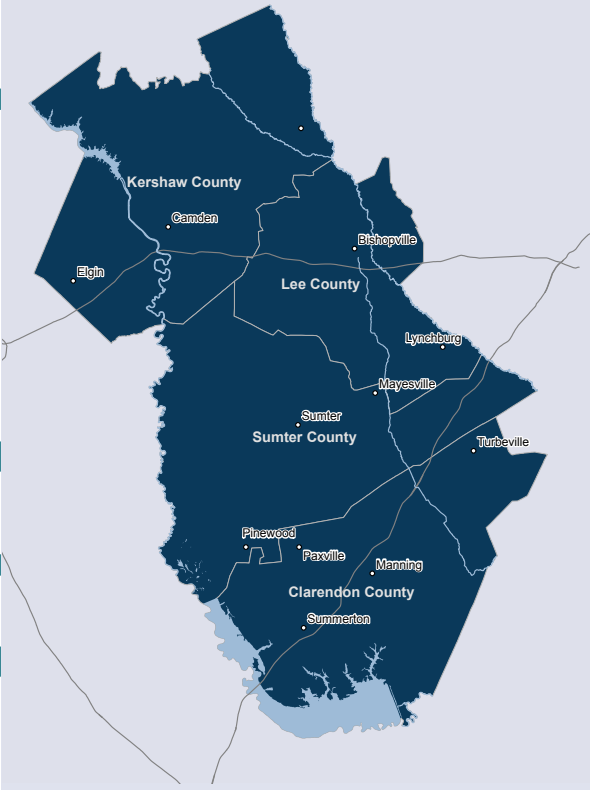


Funded by the South Carolina Forestry Commission under a grant from the USDA.
Unique Places LLC provided GIS Analysis and mapping.

For more information about green infrastructure planning, refer to “Evaluating and Conserving Green Infrastructure Across the Landscape: A Practitioner’s Guide” by Karen Firehook at <http://www.state.sc.us/forest/gic-sc15.pdf>

Introduction

Santee-Lynches Region



The Santee-Lynches region covers 2400 square miles and is home to nearly 240,000 residents. The region has diverse landscapes including a rich natural landscape of wetlands, forests, farmland, rivers, a complex cultural landscape that includes Native American settlements and a historic colonial sites, and small cities and towns. The region's natural assets include Lakes Wateree and Marion, portions of four major rivers (Wateree, Black, Santee, and Lynches), and

numerous state parks, state forests, heritage preserves, and wildlife refuges.

The region has long been an agricultural hub, but like much of South Carolina, there has been steady growth and urbanization as manufacturing, retail, and service industries have become the dominant employment sectors. The area grew at 6.0% rate between 2000 and 2010 and that growth rate is expected to continue particularly in the Sumter metropolitan area and western Kershaw County. As the region's human footprint continues to expand, planning for the stewardship and enhancement of the invaluable natural, cultural, and economic assets of the region is critical to ensure a high quality of life for residents and the long-term health of the environment.

What is Green Infrastructure?

Communities are comprised of the built and natural environment, both of which are critical to maintain and ensure a high quality of life for residents. Through strategically placed built infrastructure (e.g. roads, utilities) and the use and stewardship of natural resources (e.g. air, soil, water, trees), communities can ensure that residents live and prosper in a healthy environment. The natural environment is increasingly viewed as as 'green infrastructure,' a "natural life support system – an interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas; greenways, parks, and other conservation lands; working farms, ranches and forests; and wilderness and other open spaces that support native species, maintain natural ecological processes, sustain air and water resources and contribute

to the health and quality of life for America's communities nod and people."¹

The GI network is critical for healthy environments and access to breathable air, clean drinking water, and rich agricultural soils. In addition to health benefits, green infrastructure provides social and emotional benefits. To ensure the long-term maintenance and preservation of our region's green infrastructure, we need to actively plan for green infrastructure and create path forward for how to ensure our region can responsibly plan for growth and development while maintaining the natural elements critical for a healthy environment.

¹ Benedict, Mark and Edward McMahon. *Green Infrastructure Linking Landscapes and Communities*. 2006



Palmetto Park, Sumter SC

Green Infrastructure Network Components

Core

An intact area of habitat that is large enough to support multiple species. A core that has more interior species and diversity of habitats is more important in conservation efforts.

Corridor

The mostly linear connecting landscape between different cores that facilitates safe wildlife movement. Corridors and interior cores have similar habitats to facilitate movement. Corridors should be at least 300 meters wide with 100 meters of interior habitat and 100 meters of buffers as the edge habitat.

Fragmentation

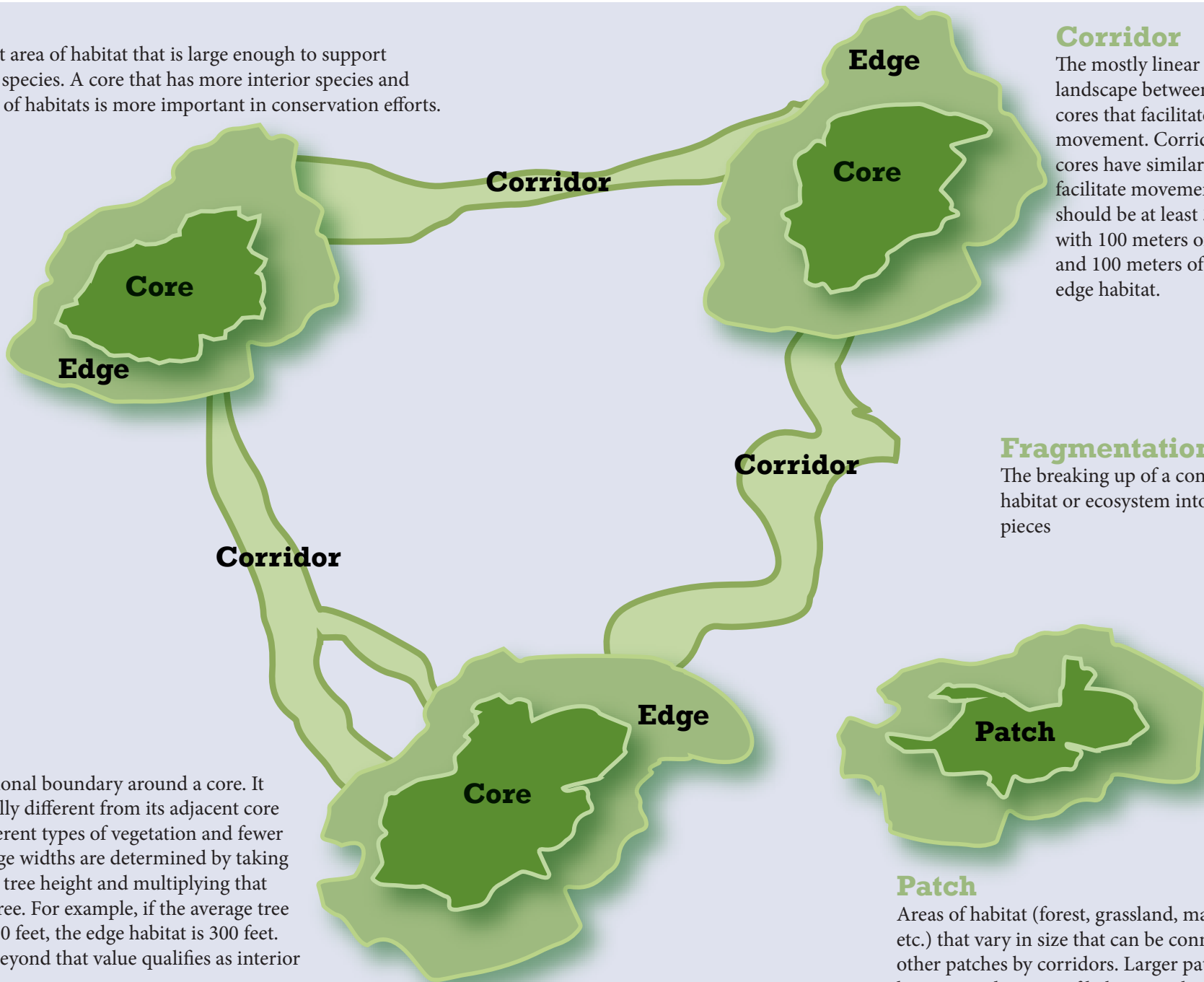
The breaking up of a continuous habitat or ecosystem into smaller pieces

Edge

The transitional boundary around a core. It is structurally different from its adjacent core having different types of vegetation and fewer species. Edge widths are determined by taking the average tree height and multiplying that value by three. For example, if the average tree height is 100 feet, the edge habitat is 300 feet. Anything beyond that value qualifies as interior habitat.

Patch

Areas of habitat (forest, grassland, marshland, etc.) that vary in size that can be connected to other patches by corridors. Larger patches usually have some diversity of habitats within them, while smaller patches are mostly homogenous.



How can this plan be used?

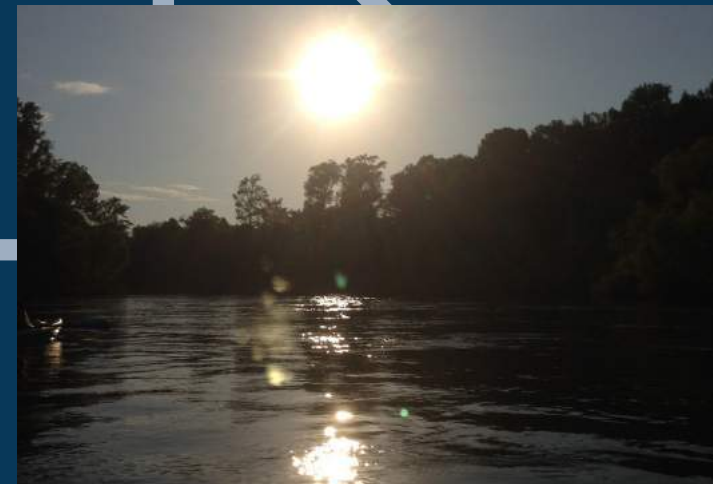
Green infrastructure planning is an ongoing multi-jurisdictional, collaborative process that helps communities develop policies and strategies that accommodate growth and development while preserving and enhancing the natural assets of the region. This plan provides communities and stakeholders with shared knowledge about the region's assets so that we can simultaneously plan for the natural and built landscape. The integration of green infrastructure planning into the development of the built environment will ensure that communities are maximizing the benefits of green infrastructure.

By using a regional approach to green infrastructure planning, we will have a more nuanced understanding of how the natural systems link all of us together. For example, from a city- or county-level perspective, we may see a forested area as a potential site for development. However, when examining green infrastructure from a regional level, that land may be part of a critical corridor connecting one habitat core in one county to another habitat core in a separate county. This type of larger-scale analysis can inform better decision-making and prevent us from planning in a vacuum.

This document is as a planning tool for municipalities, transportation agencies, natural resource agencies, and others to incorporate green infrastructure planning into long-range initiatives. The Plan emphasizes objectives that can be used by resource agencies, private foundations, cities, counties, and other local or state agencies for updating master plans, transportation plans, or watershed plans. This tool does not seek to stop development or limit population growth. Rather, it provides information about the natural landscape to help us evaluate important environmental factors and take steps to protect and enhance what is important. Development will then occur in ways that recognize and protect the area's most important natural resources. The implementation of this plan will provide the us with healthy and vibrant communities, economic growth opportunities, cost savings, conserved natural areas, and numerous other benefits.



Clarendon County SC



Wateree River, Sumter County SC



Cornwallis House, Camden SC

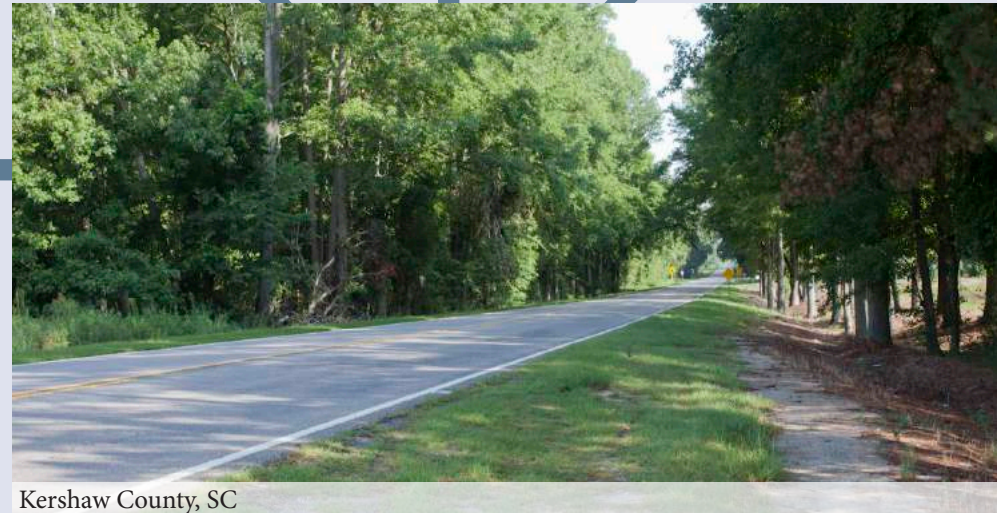
How will results be achieved?

No one person or organization can protect the environment and ensure that natural resources are appropriately preserved, conserved, and utilized effectively. The strategies in this Plan are meant to be carried out by a variety of different groups, including Santee-Lynches Council of Governments, units of local governments in the four-county region, non-profit organizations, and citizen groups. Some strategies include reference to an organization, while others may yet be unspecified as to who will take the lead role.

I Am A	How Can I Support This Plan?
Advocate/ Interested Citizen	<ul style="list-style-type: none">• Communicate the regional vision and show a desired direction• Track progress towards the objectives of this Plan using the indicators identified• Participate in the implementation of the Plan by volunteering with non-governmental organizations to build partnerships to achieve the best results
Public Official or Employee	<ul style="list-style-type: none">• Align publicly provided services and programs with the objectives in the Plan.• Inform policy, operational, and budget decisions• Encourage a region-wide planning framework to guide subsequent plans and ensure that local plans are included in the larger picture
Business or Community Organization	<ul style="list-style-type: none">• Commitment to work together to achieve the regional GI objectives• Grow current businesses that rely on and responsibly use natural resources, attract new businesses that do the same, and ensure sustained employment and profitability• Market our Region's GI assets to prospective residents and businesses



Clarendon County Courthouse, Manning SC



Kershaw County, SC

Planning Process

There were two components to the Green Infrastructure Planning Process: stakeholder engagement and geospatial analysis. The stakeholder sessions helped identify different themes, concerns, and questions about the region which guided the geospatial analysis and the policies set forth in this document.

Stakeholder Engagement

Green Infrastructure Kick-off

The Kick-Off convened a wide range of stakeholders representing local and county governments, conservation groups, state parks, and public utilities to begin thinking about regional green infrastructure. This session provided an overview of green infrastructure at multiple scales, the natural assets of the region, and the goals of the plan. Attendees offered input on the planning process, goals, and articulated their community's own needs in regard to green infrastructure.

Mapping Exercise

The second meeting extended the information-gathering process with attendees participating in a mapping exercise on the current landscape of the Santee-Lynches region. Using thematic maps showing recreation, water quality, and land use as a starting point, participants vetted the information displayed on the maps, identified challenges and obstacles to implementing a regional green infrastructure plan, identified potential concerns about the environment, and brainstormed opportunities to enhance connectivity throughout the region.

Priorities and Feasibility Exercise

Using the feedback obtained from the Mapping Exercise meeting, this session focused on brainstorming different policies related to some of the major concepts identified in the previous sessions. In a collaborative process, attendees brainstormed a variety of policies and then organized those policies based on the priority and feasibility of each policy.

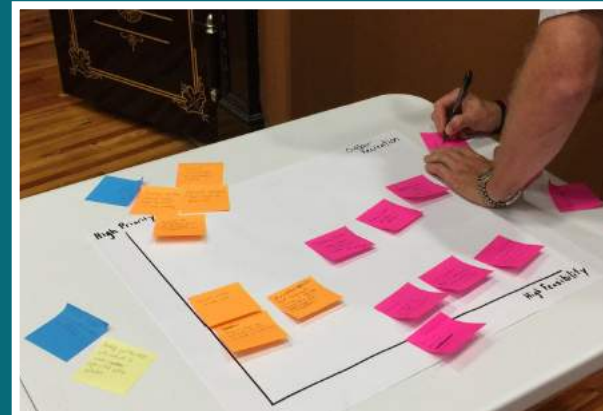
Final Review

The final stakeholder session focused on reviewing the maps developed by the consultant and providing feedback on draft goals, objectives, and indicators. The discussion also focused on how to make the GI Plan a living document usable by all communities in the Santee-Lynches region.

Geospatial Analysis

The geospatial analysis provided comprehensive spatial understanding of the diverse assets of the Santee-Lynches region. The ten thematic maps developed in this process provide an inventory of current conditions in the region and serve as one of the information sources from which the policies were developed. The following maps can be found on pages 13-22.

- | | |
|---------------------------------|--------------------------|
| 1. Agricultural Resources | 6. Water Quality |
| 2. Silvicultural Resources | 7. Land Cover Change |
| 3. Recreational Assets | 8. Species Richness |
| 4. Historic and Cultural Assets | 9. Protected Lands |
| 5. Wildfire Ignition Density | 10. Intact Habitat Cores |



Objectives, Strategies, and Indicators

The thematic maps, in conjunction with local expert knowledge, inform a series of ambitious objectives, strategies, and indicators which will help local governments and organizations assess their progress in conserving the region's valued assets and enhancing the long-term health of the region. The following section is organized around five thematic objectives which address the priorities identified during the stakeholder engagement sessions:

1. Conserve significant contiguous habitat and enhance habitat connectivity
2. Protect a network of riverine, lake, and land-based opportunities to enhance human enjoyment
3. Improve assessment, management, protection, and/or restoration of natural assets to create healthy ecosystems, communities, and economies
4. Increase public awareness of and support for green infrastructure
5. Provide water quality planning that efficiently manages resources and protects human and environmental health
6. Effectively manage natural resources that protect and provide for economic prosperity

Under each of those goals is a series of Strategies which identify more specific actions that support the implementation of the plan. The Indicators can be used to measure overall success; however, the indicators are not tied specifically to a single objective.



Pearl Fryar Topiary Garden, Bishopville SC



Woods Bay State Park, Sumter SC



Manning, SC

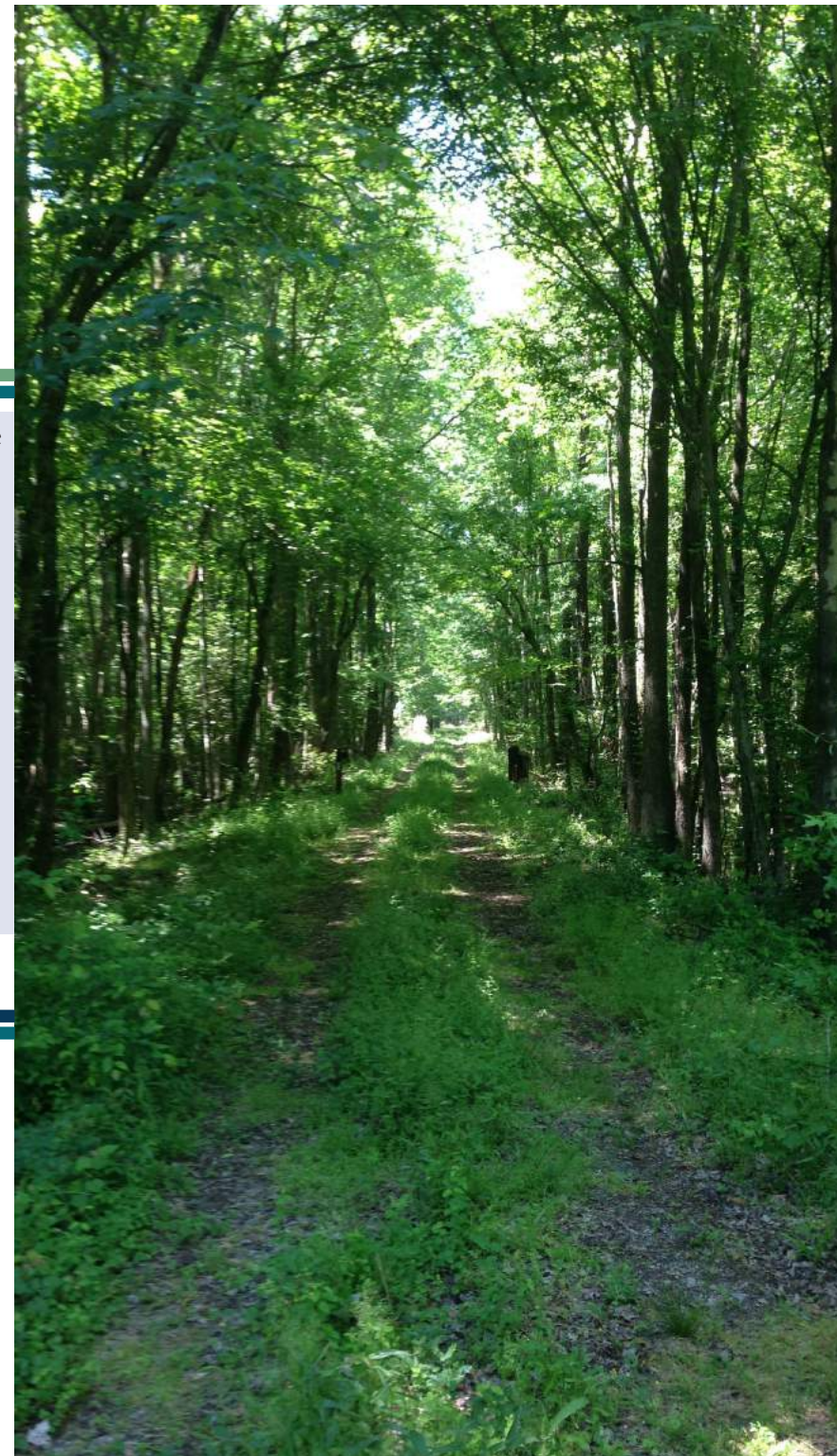
Conserve significant contiguous natural habitat and enhance habitat core connectivity

Strategies

1. Collaborate with landowners on land acquisition and conservation easements to create corridors and connect habitat cores
2. Implement best management practices (BMPs) on private lands that enhance the corridors and connectivity
3. Prioritize areas within the GI network that would benefit from habitat restoration
4. Restore and protect identified areas in GI network (particularly in habitat corridors and edges) to natural habitats
5. Work with local governments to include conservation goals and ordinances in their comprehensive plan and zoning ordinances
6. Implement strategies to protect wildlife along major roadways
7. Evaluate under-utilized roadways particularly in areas proximate to critical habitats to assess potential for rubblizing or removing from maintenance plans

Indicators

1. Increase in acres of land protected via acquisition or conservation easement, particularly within identified corridors
2. Increase in number of acres of restored habitats that support healthy terrestrial or aquatic wildlife
3. Increase in amount of funding to conserve land
4. Increase in number of property owners using BMPs on private lands
5. Establishment of critical wildlife crossings to ensure connectivity of corridors and safe wildlife movement
6. Reduction in wildlife killed on roadways



Pocotaligo River Nature Walk, Manning SC

Protect a network of riverine, lake, and land-based opportunities to enhance human enjoyment

Strategies

1. Identify existing formal and informal green spaces and trails in the region and potential connections between spaces and trails
2. Develop a local and regional network of multi-modal trails
3. Evaluate accessibility to green space in urbanized areas of the region by developing a desired metric and spatial analysis method to for green space accessibility
4. Improve public access to area waterways and increase the use of those waterways for recreational and educational programming
5. Encourage conservation of areas popular for hunting by working with the SCDNR and area hunting clubs
6. Explore funding mechanisms to implement outdoor recreational opportunities (e.g. trails, parks. etc)

Indicators

1. Greater spatial equity in access to green spaces in urbanized areas
2. Increase in number of trails and length of trails within region
3. Development of maps, websites, apps, etc. that display regional outdoor recreation opportunities and historic sites
4. Increase in public access points to region's waterways
5. Establishment of trails, greenways, and protected lands within a 20 minute drive for every resident in the region.
6. Increase in human traffic at parks, preserves, and on waterways
7. Expansion of existing recreation areas such as state parks.



Wateree River, Camden SC

Improve assessment, management, protection, and/ or restoration of natural assets to create healthy ecosystems, communities, and economies

Strategies

1. Encourage communities to include the regional GI plan and recommendations into their respective comprehensive planning and regulatory processes
2. Facilitate collaboration among different local governments to create streamlined conservation planning efforts
3. Encourage policies and incentives for infill development, remediation and development of brownfields, conservation development, cluster development, and incorporation of low-impact development techniques into new development
4. Identify hazards such as floodways, unstable slopes, and areas prone to sinkholes to protect public safety and prevent future hazards
5. Explore farmland and other rural economy landscape protection mechanisms at a policy and individual level
6. Encourage greening of hardscapes – parks, street trees, conversion of vacant lots to garden or parks, permeable pavement etc.
7. Improve stormwater infrastructure and practices at a local level to improve drainage
8. Encourage adoption of regulations for tree protection throughout the region
9. Encourage local governments to adopt Complete Streets Policies
10. Develop a comprehensive hazard mitigation plan and recommendations (high disaster prone areas, green spaces, code enforcement)
11. Update and use floodplain maps to target flood-prone areas for development restrictions
12. Identify wetlands in the region that are not captured by the National Wetlands Inventory mapping program
13. Develop strategies to remove structures from floodplain to limit damage from natural disasters

Indicators

1. Amount of farmland acreage converted for development
2. Reduction in vacant structures and land within developed areas of the region
3. Regular and purposeful communication among local governments regarding conservation planning efforts
4. Increase in green infrastructure strategies (street trees, bioswales, etc.) within urbanized areas
5. Increase in the number of communities that include conservation or green infrastructure in comprehensive plans or zoning ordinances
6. Increase in communities that align their environmental vision with the regional plan
7. Reduction in properties or persons affected by flooding-related disasters
8. Adoption of tree protection ordinances throughout the region
9. More detailed wetlands maps beyond the National Wetlands Inventory map

Increase public awareness of and support for green infrastructure

Strategies

1. Identify and work with local organizations, stakeholders, and educational institutions to share information about green infrastructure and the environment
2. Install educational signage in urban parks, nature areas, near waterways, etc. highlighting green infrastructure and environmental challenges
3. Promote volunteer efforts for restoration and cleanup activities
4. Distribute GI network maps in the region and smaller communities
5. Explore and establish “green” volunteer and job training opportunities
6. Collaborate with community organizations to provide workshops on site-scale green infrastructure and water quality management strategies (bioswales, rain gardens, downspout disconnections)
7. Advocate for increased federal, state, and local funding for land conservation and restoration
8. Quantify the economic value associated with green infrastructure and natural ecosystem services
9. Work with federal, state, and local health organizations to measure the impacts of green infrastructure for numerous components of public health including better air quality, access to recreational spaces, lower temperatures, etc



Retention pond at Palmetto Park, Sumter SC



Educational signage, Patriot Park, Sumter SC



Educational signage and audio, Swan Lake Sumter SC

Indicators

1. Increase in number of organizations and volunteers that engage with natural spaces or work to protect/restore natural spaces
2. Increased local and private funding for land conservation and stewardship
3. Placement of GI network maps in local institutions



Provide water quality planning that efficiently manages resources and protects human and environmental health

Strategies

1. Establish/update specific protection strategies for lands that are critical to the quality of public water supplies including groundwater recharge areas
2. Consolidate wastewater treatment facilities into regional treatment plants
3. Reduce reliance on septic tanks and septic systems throughout region
4. Encourage site scale stormwater control systems (rain gardens, bioswales)
5. Increase education opportunities about importance of water quality and how to maintain/improve local water quality
6. Connect drinking water systems to improve resiliency and ensure stable water supply for residents of the region
7. Link water quality monitoring data to the Green Infrastructure map as a framework to guide efforts to both protect areas with high water quality and to help improve areas with lower water quality

Indicators

1. Increase in number of stormwater control systems integrated into construction projects
2. Reduction in impaired water bodies (303(d) list) in Santee-Lynches region
3. Increase in acreage of restored wetlands ecosystems
4. Establishment of water quality goals at higher standard than state or local regulations
5. Creation of source water protection plans for major water providers.
6. Increase in number of testing sites and frequency of monitoring
7. Establishment of tree planting program and/or increase in trees planted along roadways and in urbanized areas
8. Expansion of riparian buffers along waterways
9. Decrease in number of septic systems and tanks throughout the region.



Lee County, SC

Strategies

1. Identify agricultural producers that would benefit from state land conservation and stewardship programs (e.g. Environmental Quality Incentive Program) and work with them to apply for assistance
2. Work with local governments to prioritize productive of areas with soils ideal for agriculture or forestry (e.g. prime farmland)
3. Collaborate with forest management organizations and landowners to ensure that habitat cores and corridors remain intact and fragmentation is minimized when harvesting timber or farming
4. Develop tool to assess the forestry management potential on parcels throughout the region
5. Incentivize businesses that cater to outdoor recreation

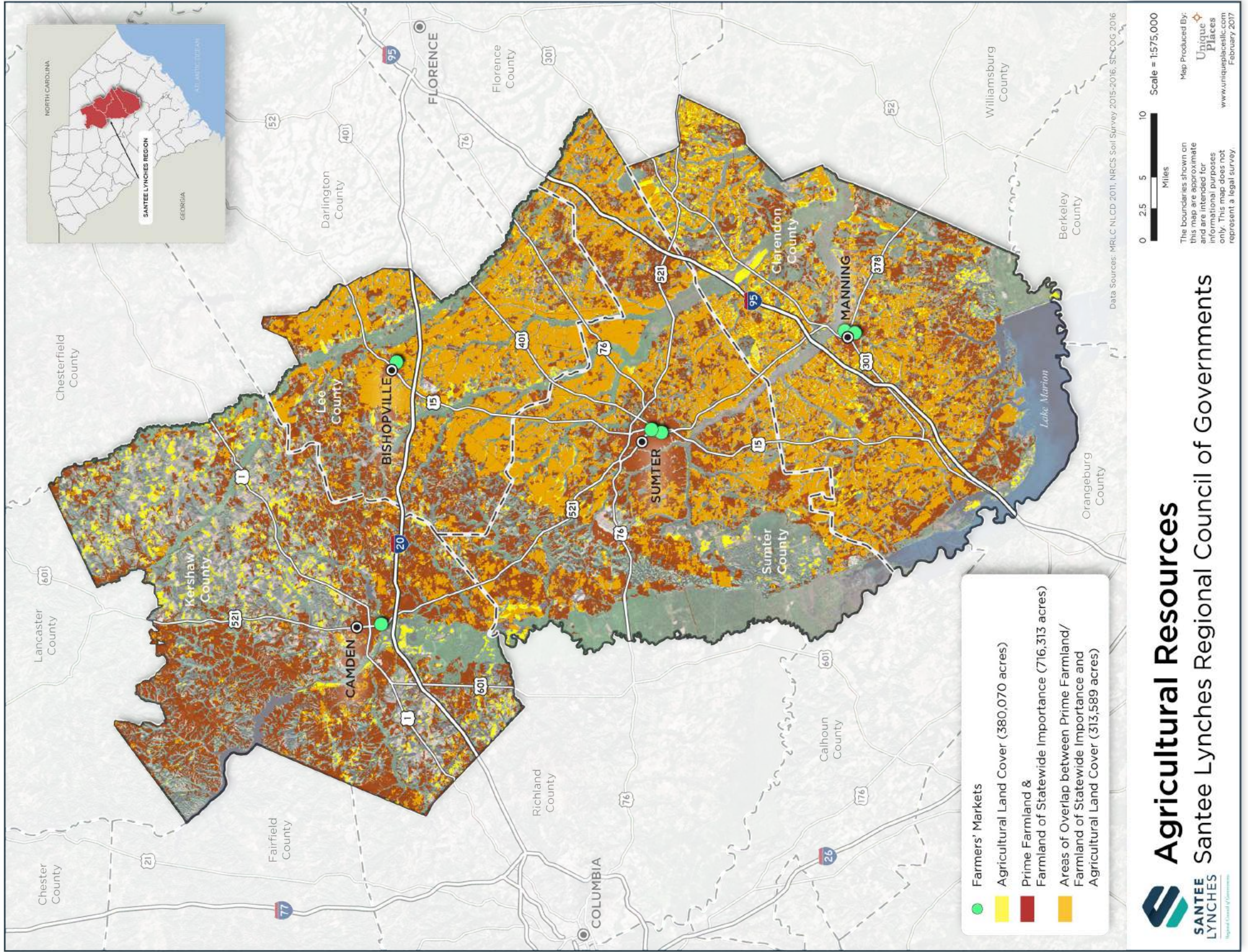
Indicators

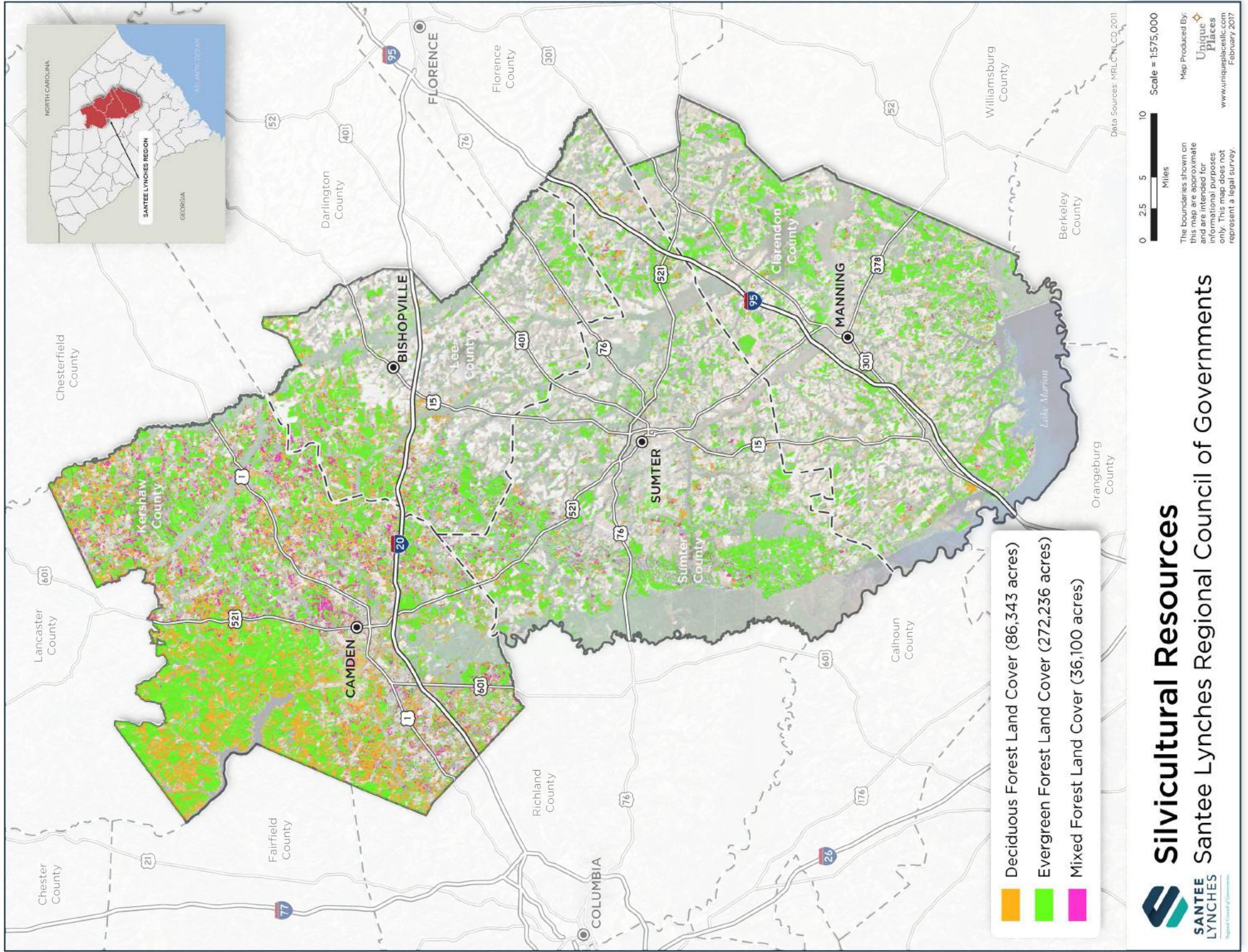
1. Increase in location quotient of agriculture, forestry, and outdoor recreation
2. Increase in number of jobs in agriculture, forestry, and outdoor recreation
3. Value of agricultural products
4. Number of outdoor recreation-focused businesses

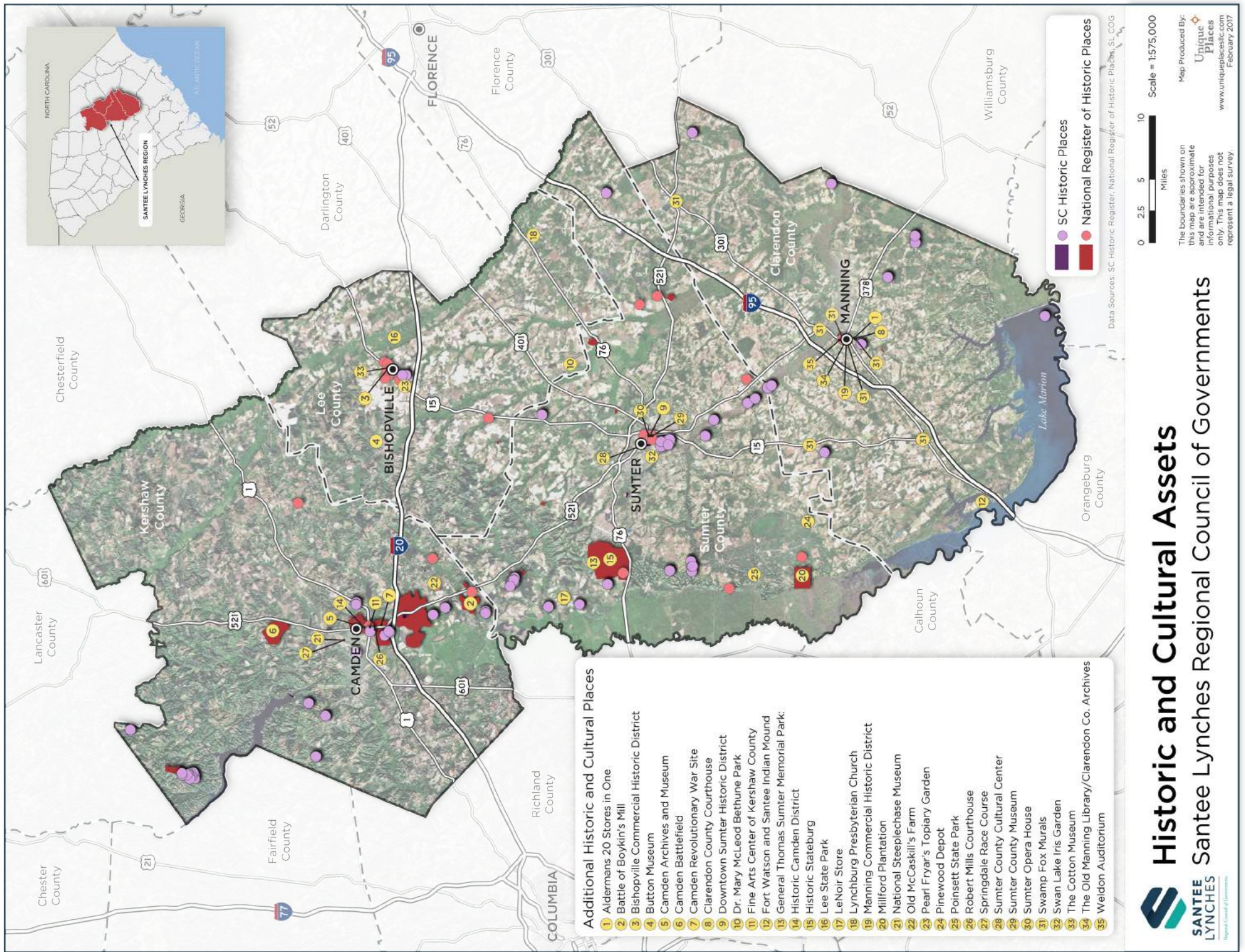
Effectively manage natural resources that protect and provide for economic prosperity



Lee County, SC

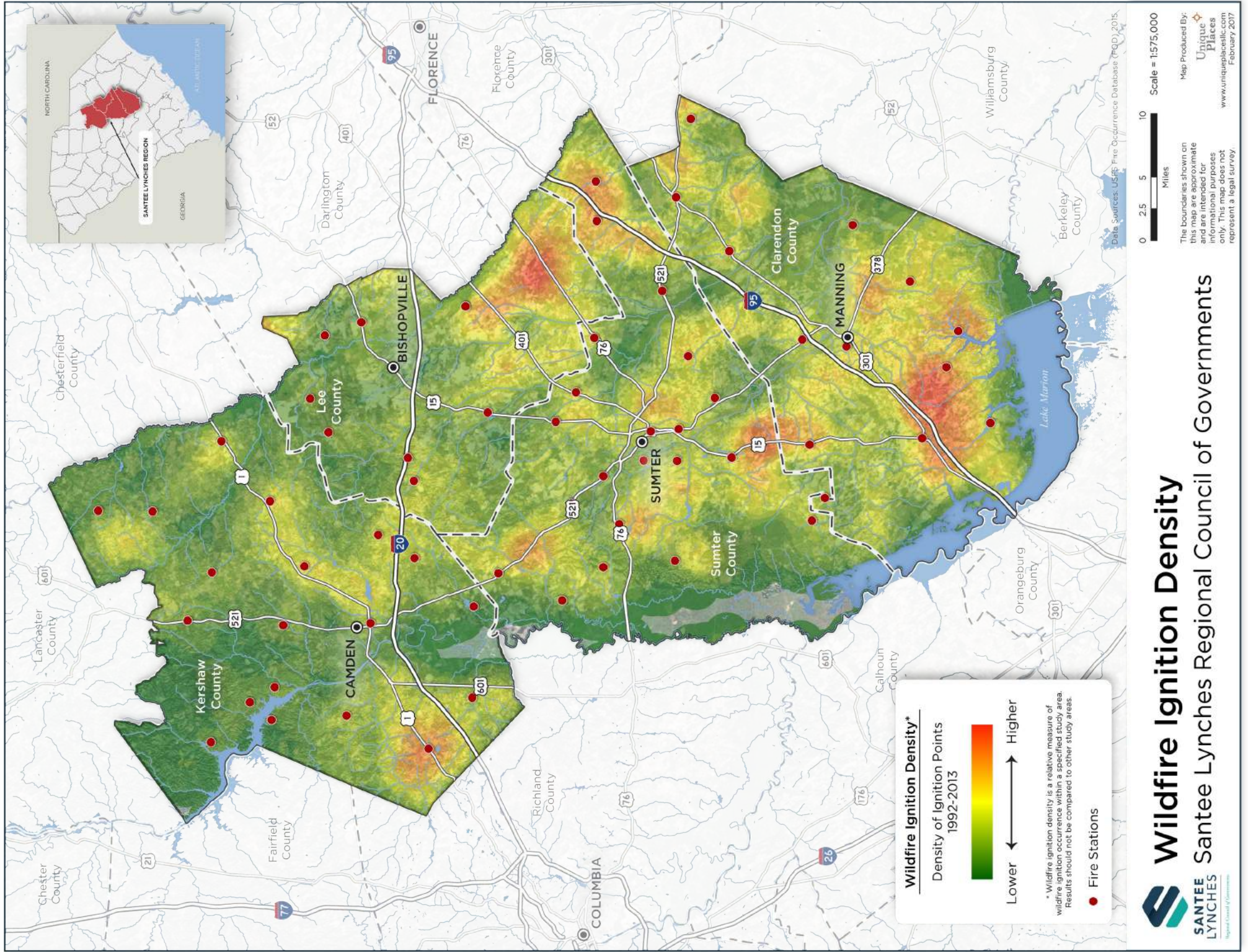


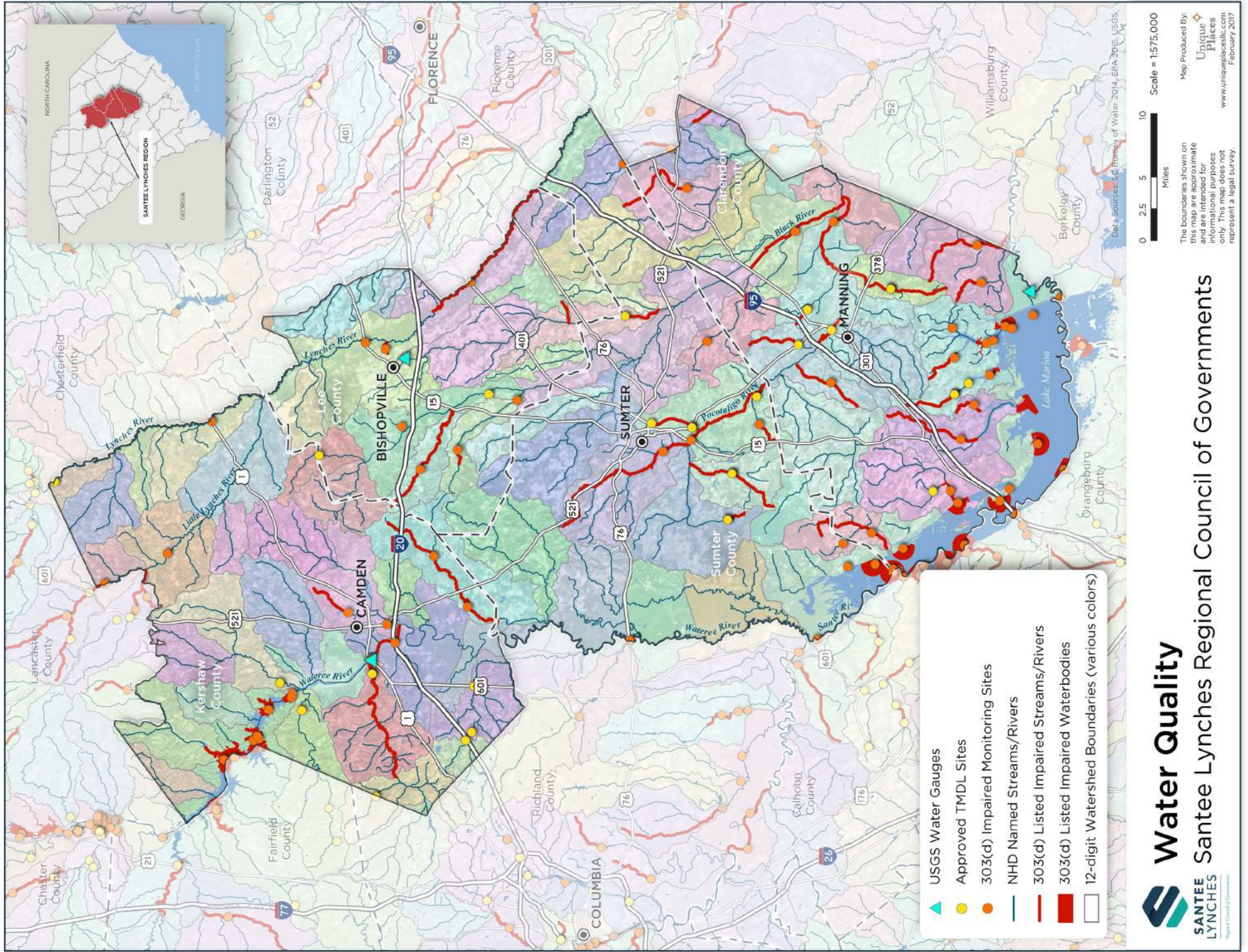


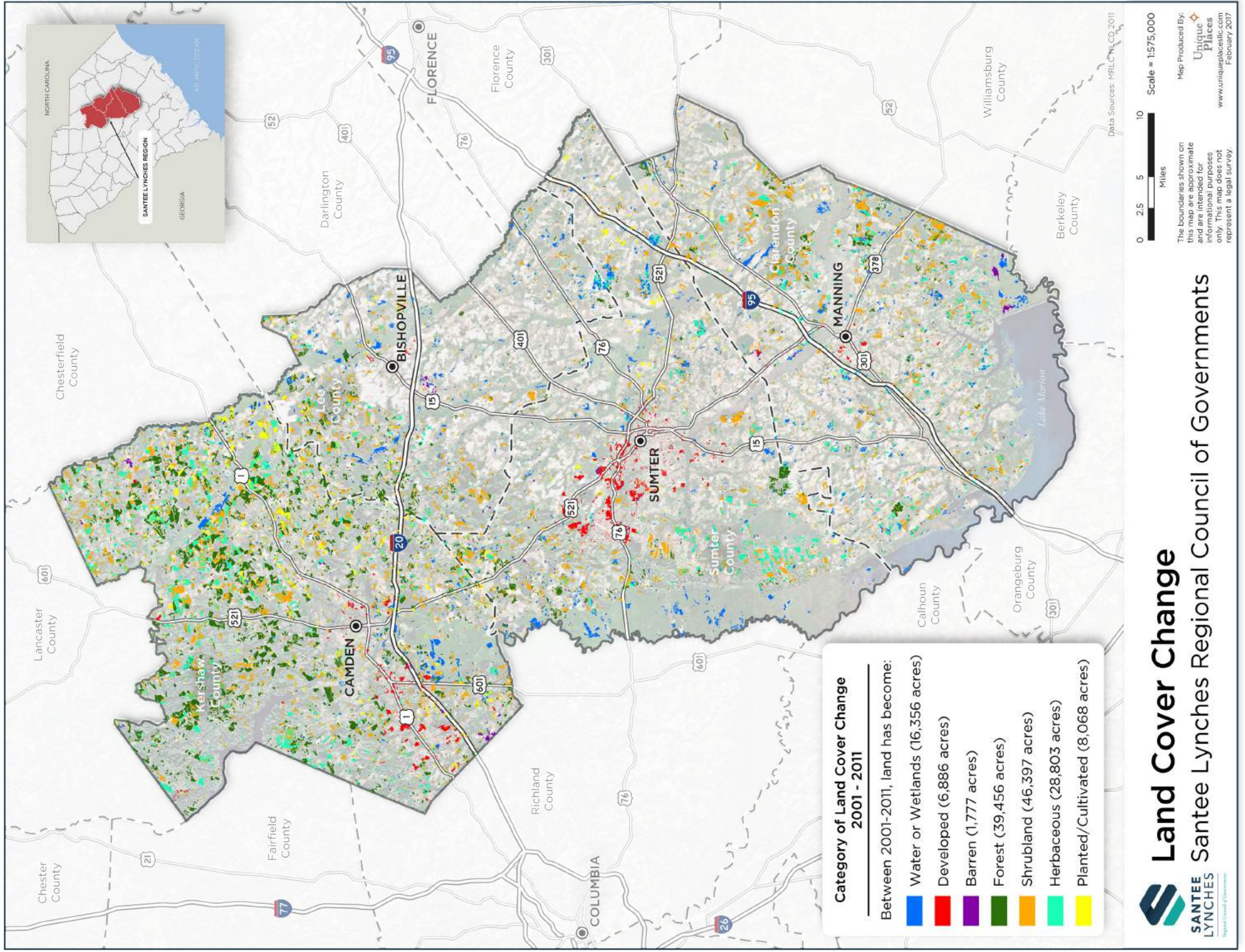


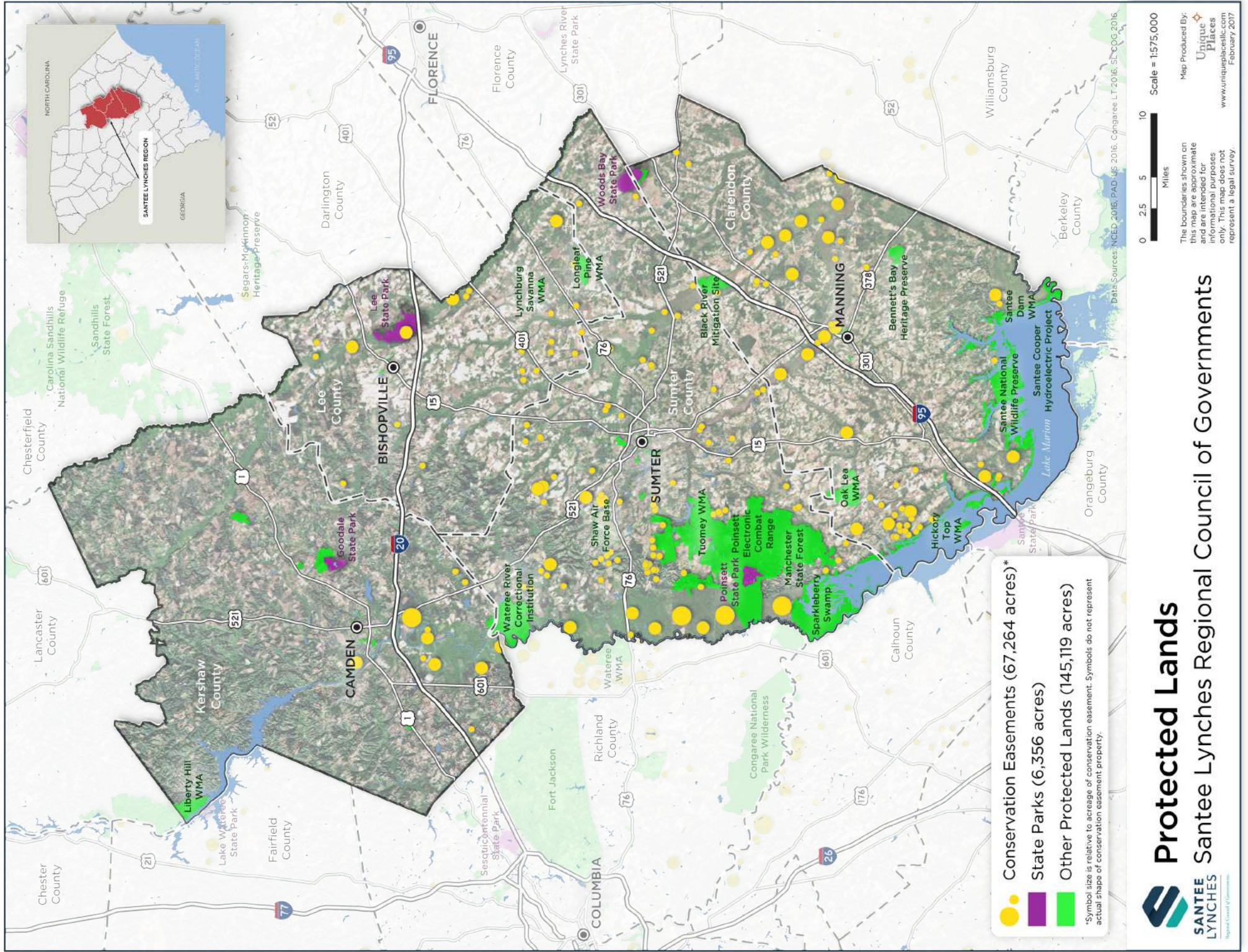
Historic and Cultural Assets

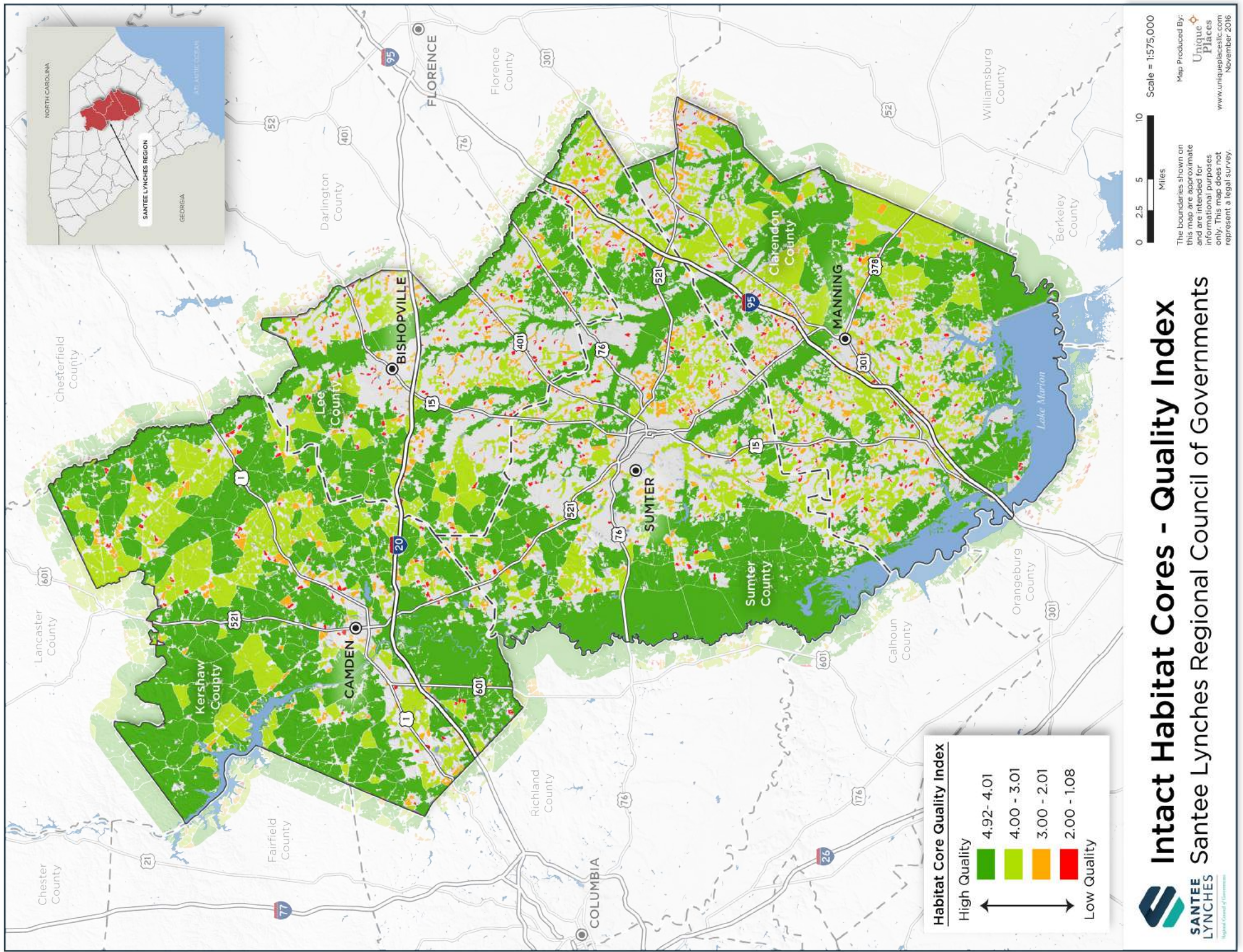
Santee Lynches Regional Council of Governments











Intact Habitat Cores - Quality Index **Santee Lynches Regional Council of Governments**



This data and maps presented in this plan are intended to be as accurate as possible. Any errors or omissions are unintentional. The objectives and strategies outline different approaches to enhancing green infrastructure in the region and can be used as a planning tool for groups in the region.

If you have questions or any additional information relevant to green infrastructure planning in the Santee-Lynches region, please contact Susan Landfried at slandfried@slcog.org or 803-774-1381.

