

# Community Forests in South Carolina

The community forest is the aggregate of all vegetation and green spaces within populated places. Community forests are an integral part of cities, subdivisions, streets, residential yards, parks, and open spaces. This *urban* forest provides benefits and values vital to enriching the quality of life where South Carolinians live, work and play. Properly cared for and well-managed community forests can provide economic and social value that far exceed their management costs.

Community forestry is the combination of planning, establishing, and managing trees and associated plants (individually, in groups, or under forest conditions) within cities, towns, suburbs and military bases. Community forest management addresses the interface between people, the built environment and trees through a dynamic interaction of various professions including forestry, horticulture, arboriculture, landscape architecture and urban planning.

As our cities continue to grow in population and land coverage, community forest management is critical for healthy and sustainable living. Essential components of a well-managed and fully integrated program include fulltime staff and equipment, tree management and zoning policies, a tree inventory and management plan, a sustained budget and local political support.

Approximately 100 communities representing 2.5 million people live in incorporated places in SC that have some level of management. The Community Forestry program tracks, classifies and assists these communities into three distinct management levels as defined by the USDA Forest Service requirements for receiving federal funds for the state program implementation. These levels are: managed, developing and non-participating. A managed community is one that has established all of the following: a fulltime professional staff position, a management plan, tree policy, and an advocacy group. A developing community is one that has established one to three of the above listed components. A non-participating community is one that has not yet established any of the above listed components. Listed below are the definitions for and examples of the program management components.

Professional Staffing: An individual who has one or more of the following credentials, and who the community directly employs or retains through written agreement to advise and/or assist in the development or management of their urban and community forestry program: 1) a degree in urban forestry or a closely related field (e.g., forestry, horticulture, arboriculture, etc.), and/or; 2) International Society of Arboriculture Certified Arborist (ISA) or equivalent professional certification.

Management Plan: A detailed document or set of documents developed from professionally-based inventories/resource assessments that outline the future management of the community's trees and forests. Examples of management plans include: Urban Forest Master Plan, Public Tree Planting and Maintenance Plan, Comprehensive Land Use Plan that incorporates specific management recommendations for the community's trees and forest resources, and a Hazard Tree Reduction and Replanting Plan based on an inventory of community trees.

Ordinance/Policy: Statutes or regulations that direct citizens and local governments in the planting, protection and maintenance of urban and community trees and forests. Examples include: Public Tree Care and Maintenance Ordinance, Tree Preservation and Landscaping Ordinance, Watershed Protection Ordinance, and Tree Conservation and Tree Warden Ordinance.

45 Advocacy/Advisory Organization: An organization that is formalized or chartered to advise  
46 (organizations established by the local government) or advocate or act (non-governmental  
47 organizations active in the community) for the planting, protection and maintenance of urban  
48 and community trees and forests.

49 Approximately 25% of incorporated municipalities (> 1,000 in population) live in a managed  
50 community. This represents 760,832 South Carolinians. Approximately 54% of incorporated  
51 municipalities (> 1,000 in population) live in a developing community. This represents 1,673,440  
52 South Carolinians.

53 The goal of the SCFC's Community Forestry Program is to create, enhance and support long-  
54 term local, regional and statewide community forestry programs. To accomplish this, the  
55 community forestry staff provides state-wide technical and educational assistance regarding the  
56 components listed above as well as tree inventories, grant project implementation, tree and  
57 utility line issues, and air and water quality issues. Additional services offered include Tree City  
58 USA and Tree Campus USA implementation, proper tree selection, installation, care and  
59 maintenance, distribution of educational information, coordinate and conduct training  
60 workshops, and Arbor Day/Earth Day activities. Primary assistance is provided to personnel  
61 working for towns, cities and counties. Secondary assistance is provided to professional  
62 associations, civic and volunteer organizations, state agencies, educational institutions,  
63 businesses and others.

64 Up until January 2010, the Community Forestry Program has also provided financial assistance  
65 to a wide array of entities in the form of 1-to-1 cost-share grants. Over the past 18 years, the  
66 program awarded approximately \$4.5 million dollars to over 620 municipalities, counties, non-  
67 profit organizations, state agencies and educational institutions across the state. There are four  
68 basic categories which are available for funding: Community Forestry Program Development,  
69 Community Forestry Program Improvement, Information & Education and Public Tree Planting.

70 These grants have not only helped establish most of the municipal forestry programs that exist  
71 today and cited above but have also provided funding for thousands of trees to be planted in  
72 public spaces and have helped provide the skill set needed for those charged with public tree  
73 management. Hundreds of local government and university tree managers have been able to  
74 attend urban forestry and arboriculture related educational events and at least a dozen folks  
75 have become ISA Certified Arborists or Municipal Specialists through this program. This  
76 educational and accreditation assistance is not available through any other state agency.

77 During 2009, SCFC community forestry staff provided technical, educational and/or financial  
78 assistance to approximately 60 local government entities with a collective population of  
79 2,434,272 citizens.

80 This type and availability of assistance described above is very specialized and is only provided  
81 by the Forestry Commission. No other public agency fills this much needed niche. While the  
82 potential and need for the Community Forestry Program to impact many more communities and  
83 SC citizens exists, the optimal resources to do so do not.

84 One of the tools used to engage and initiate community forestry management within  
85 municipalities is Tree City USA program (<http://www.arborday.org/programs/treeCityUSA/>).  
86 Tree City USA is a community improvement program sponsored by The National Arbor Day  
87 Foundation in cooperation with the US Conference of Mayors, the National League of Cities, the  
88 National Association of State Foresters, the USDA Forest Service and the SC Forestry  
89 Commission. In order to qualify, a community must meet four standards:

- 90 • Establish a tree commission or designate a municipal department responsible for public  
91 trees
- 92 • Develop, pass and implement a municipal public tree care ordinance
- 93 • Conduct a local Arbor Day observance and celebration
- 94 • Spend \$2 per capita on community forest management

95 These standards provide a framework for action and initial direction for a community forestry  
96 program. Like the first rungs on a ladder, the standards help get a community started toward  
97 annual, systematic management of its tree resources. South Carolina's Tree Cities have been  
98 steadily increasing over the past 12 years and in 2009 we recertified 42 entities. These include  
99 38 municipalities, 3 military bases and 1 county.

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## 101 **Human Benefits of Trees and Forests**

102 Trees and forests have a real impact on the economic, social, and physical well-being of people.  
103 Folks gravitate toward green and well-landscaped areas where trees are the predominant  
104 feature. Trees planted in public places (streets, parks, schools, cemeteries, and college  
105 campuses, for example) as well as in accessible forested areas provide a wide array of tangible  
106 and non-tangible benefits to the public. Trees are on the job 24 hours every day working for all  
107 of us to improve our environment and quality of life.

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## 110 **Economic Benefits**

111 Trees are major capital assets in cities and towns. Just as streets, sidewalks, sewers, public  
112 buildings and recreational facilities are a part of a community's infrastructure, so are publicly  
113 owned trees. Trees, and collectively, community forests are important assets that require care  
114 and maintenance the same as other public property. (USFS 2003)

115 The community forest is seen by many municipal governments and business owners as  
116 improving the company's image by sending a "message of care" to potential customers. Trees  
117 attract businesses and tourists to an area, thereby enhancing the community's economic  
118 stability (GFC 2010). Some economic benefits of community forests include:

- 119 • More income for businesses. Customers will pay as much as 10 percent more for some  
120 goods and services provided by businesses that are located on tree-lined streets.
- 121 • Surveys show a 30 percent higher sales rate for shopping areas with large numbers of  
122 shade trees versus sales of the same products in shopping areas without trees.
- 123 • Customers tend to linger longer in areas with trees than those that are barren.
- 124 • "Trees absorb and store an annual average of 13 pounds of carbon each year.  
125 Community trees across the United States store 6.5 million tons of carbon per year, resulting  
126 in a savings of \$22 billion in control costs" (GFC 2010).
- 127 • Employees who have a view of trees are more productive, with 23 percent less  
128 incidence of illness than those who cannot see trees. Those with a view also report a higher  
129 level of enthusiasm for their job and are generally more patient than those without a view  
130 (Wolf 1998).

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132 The presence of trees also has a positive effect on occupancy rates and residential home sales.

- 133 • Neighborhood greenspaces or greenways typically increase the value of properties  
134 located nearby.

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- Healthy trees can add up to 15 percent to residential property value.
  - Wooded apartment complexes provide preferred aesthetics that can increase occupancy rates (SCFC 2010).
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### 139 **Energy Conservation**

- Trees can help cool the "heat island" effect in our inner cities and downtown areas. These islands result from storage of thermal energy in concrete, steel and asphalt. Heat islands are 3 to 10 degrees warmer than the surrounding countryside. The collective effect of a large area of transpiring trees (evaporating water) reduces the air temperature in these areas.
  - Strategically placed shade trees - a minimum of three large trees around a home - can reduce air conditioning costs up to 30 percent. Shade trees offer their best benefits when deciduous trees are planted to shade all hard surfaces such as driveways, patios and sidewalks to minimize landscape heat load. (USFS 2003)
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### 150 **Air Quality**

- Trees and other plants release oxygen (O<sub>2</sub>) for us to breathe and in turn, absorb carbon dioxide (CO<sub>2</sub>) and other dangerous gases.
  - Trees help to settle out, trap and hold particulate pollutants (dust, ash, pollen and smoke) that can damage human lungs.
  - An acre of trees produce enough oxygen for 18 people every day.
  - During one year, an acre of trees absorb enough CO<sub>2</sub> to equal the amount produced when a car is driven 26,000 miles.
  - Trees remove gaseous pollutants by absorbing them through the pores in the leaf surface. (USFS 2003)
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### 160 **Water Conservation**

161 Tree roots increase soil permeability, resulting in:

- Reduced surface runoff of water from storms.
  - Reduced soil erosion and sedimentation of streams.
  - Increased ground water recharge.
  - Lesser amounts of chemicals transported to streams. (USFS 2003)
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### 168 **Health Benefits**

- Physical Activity/Obesity: Studies have found a correlation between community forests and the average amount of physical activity exerted by neighborhood residents. People are more inclined to get outdoors and exercise when their surroundings are greener. Greater physical activity can lead to fewer cases of obesity, which in turn may help
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173 reduce other health problems such as heart disease and diabetes. Savings to individuals  
174 and the nation can be substantial: health care costs in America associated with obesity  
175 top \$100 billion a year.

176 • Asthma: Trees filter airborne pollutants and can reduce the conditions that cause asthma  
177 and other respiratory problems. Asthma incidents increase in urban communities where  
178 trees are eliminated in favor of new roads, homes, or commercial developments. The  
179 American Lung Association estimates that ozone-associated health care costs  
180 Americans about \$50 billion annually (ALA 1997).

181 • Hospital Stays: Post-operative stays are shortened when patients have a view of trees  
182 and open spaces.

183 • Attention/Focus: Children who spend more time outside pay better attention inside.  
184 Attention-deficit/hyperactivity disorder (ADHD) children, in particular, are better able to  
185 concentrate, complete tasks, and follow directions after playing in natural settings.

186 • Reduced Air Temperatures: By reducing air temperatures and building energy use, and  
187 directly removing ozone and NO<sub>x</sub> from the air, trees reduce ozone concentrations.  
188 However, trees can also influence volatile organic compound (VOC) emissions that can  
189 lead to ozone formation.

190 • Reduced Ultraviolet Radiation: trees provide shade and therefore protection from the  
191 sun. Tree canopy coverage on school grounds and where people gather to shop and  
192 recreate can help decrease the chance of skin cancer formation.  
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### 194 **Social Benefits**

195 Studies have identified a direct correlation between the amount of trees and grass in community  
196 common spaces and the use of those common spaces by residents, which leads to more  
197 opportunities for informal social interaction and greater relationships between neighbors.

198 • Trees make communities livable for people and soften the outline of masonry, metal and  
199 glass.

200 • Trees can be associated with specific places, such as memories of past events or times,  
201 or a favorite tree climbed as a youth.

202 • Less violence occurs in urban public housing where there are trees. Researchers  
203 suggest that trees afford a place for neighbors to meet and get to know each other (Kuo  
204 and Sullivan 2001). Their research showed that friendships developed into a network of  
205 support.  
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### 208 **Current Condition**

209 Because these benefits are so broad and all-encompassing, no specific data or research has  
210 been collected or conducted here in South Carolina. However, various data on the above  
211 quantifiers can be gleaned from numerous sources.  
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### 213 **Richness**

214 South Carolina is fortunate to have an abundance of forested land despite population growth  
215 over the past 20 years as well as regional pockets of growth in the Greenville-Spartanburg  
216 corridor, the Midlands, and areas along the coast. Opportunities exist to promote trees and  
217 forests to non-traditional audiences such as those in health care and economic development.  
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219 **Threats**

220 While continued development fragments forest land and impedes forest management it also  
221 offers opportunities for state-wide tree planting initiatives and interaction with the public.

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225 **Stormwater Management**

226 Over 75 percent of the U.S. population lives in cities (Nowak et al. 2000). As a result, more and  
227 more people are disconnected from natural resources such as forests that support them and the  
228 watersheds in which they live. As a result, urban residents may take for granted the important  
229 benefits provided by forests and trees in their own back yards.

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231 Urban watershed forestry represents an important management approach given the many  
232 benefits provided by urban forests and the impact of development on forest structure and  
233 function and watershed health. Managing urban forests in ways that explicitly address  
234 watershed health can mitigate some of the negative impacts of forest fragmentation, soil  
235 compaction, and increased impervious cover in urban watersheds.

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237 A partial listing of the watershed benefits of urban forests and the unique properties of the urban  
238 planting environment are as follows:

- 239 • Reducing construction and maintenance costs (by decreasing costs related to clearing,  
240 grading, paving, mowing and storm water management);
- 241 • Reducing stormwater runoff and flooding;
- 242 • Reducing urban heat island effect<sup>1</sup>;
- 243 • Enhancing function of stormwater treatment;
- 244 • Improving soil and water quality;
- 245 • Reducing stream channel erosion;
- 246 • Providing habitat for native plants, terrestrial and aquatic wildlife; and
- 247 • Preserving of native ecotypes.

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249 Population growth, residential and industrial development, and the resulting demands on our  
250 landscape and waterways have led to water quality and quantity concerns throughout South  
251 Carolina. Currently, more than 1,150 of our lakes, rivers and creeks have been listed as  
252 impaired by the state's Department of Health and Environmental Control (DHEC).

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254 Impervious surfaces such as roads, roofs, driveways, streets, and parking lots increase not only  
255 stormwater volume, but also the rate of flow. The volume of runoff in an urban area is five times  
256 greater than that of an equally large forested area. The consequences of stormwater runoff in  
257 populated places are flooding, soil erosion, and non-point source contaminants, which  
258 negatively impact both the built and natural environment. Impacts to the built environment  
259 include property damage and loss and poor quality drinking water. Impacts to the natural  
260 environment include waterway sedimentation and poor water quality for aquatic life.

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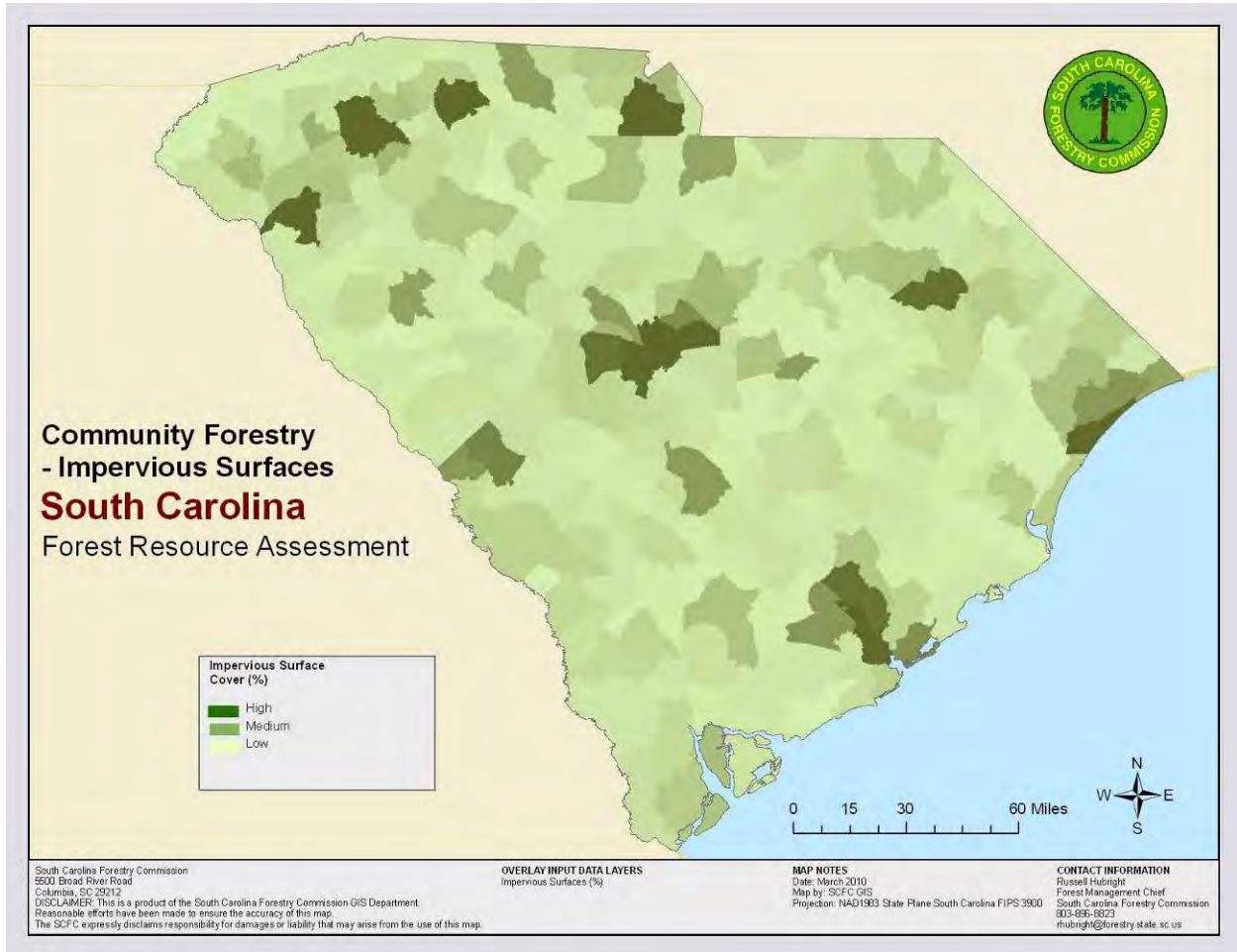
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Figure xx: Impervious Surfaces in South Carolina



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In accordance with recently passed federal legislation, South Carolina adopted a permitting process designed to manage stormwater. The stormwater rules require all construction sites of one acre or more, many industrial sites, and all regulated Municipal Separate Storm Sewer Systems (MS4s) to obtain a permit. Currently, there are over 70 municipalities throughout the state that are required to comply with the MS4 regulations. In addition, EPA stormwater rules require many of South Carolina's cities and towns to implement public outreach and education programs as part of their local efforts to reduce pollutants in stormwater runoff.

The main influence of urban watershed problems, and hence, stormwater management is land conversion of greenspace to grayspace. Examples of this land use change are the conversion of forests (greenspace) to streets (grayspace) and fields to parking lots. As with many environmental issues, stormwater management is not confined to jurisdictional boundaries.

Natural resources professionals know the many benefits and values of trees and forests. These experts must be more proactive in reaching those outside of the field who can benefit from this knowledge. Although the Forestry Commission does not have any control over the pace of population growth or development, the agency can influence how communities of people and

288 structures are arranged and built. This can be accomplished through affecting local planning  
289 and zoning policy, educational awareness, and technical assistance.

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### 343 **Glossary**

344 <sup>1</sup>urban heat island effect - an area, such as a city or industrial site, having consistently higher  
345 temperatures than surrounding areas because of a greater retention of heat, as by buildings,  
346 concrete, and asphalt. (source: <http://www.answers.com/topic/urban-heat-island>)

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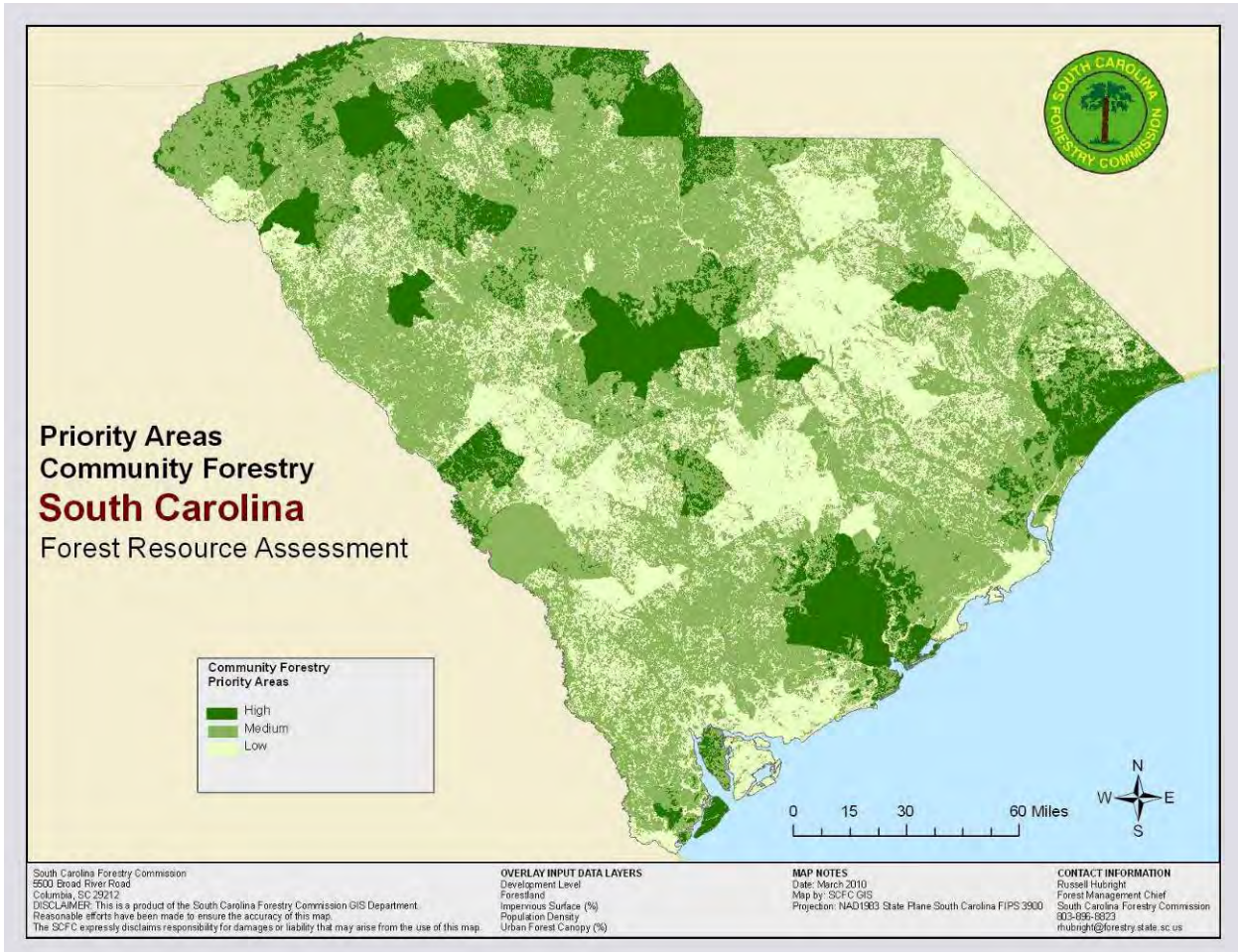
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## Priority Areas

Figure xx: Priority Areas for Community Forestry in South Carolina

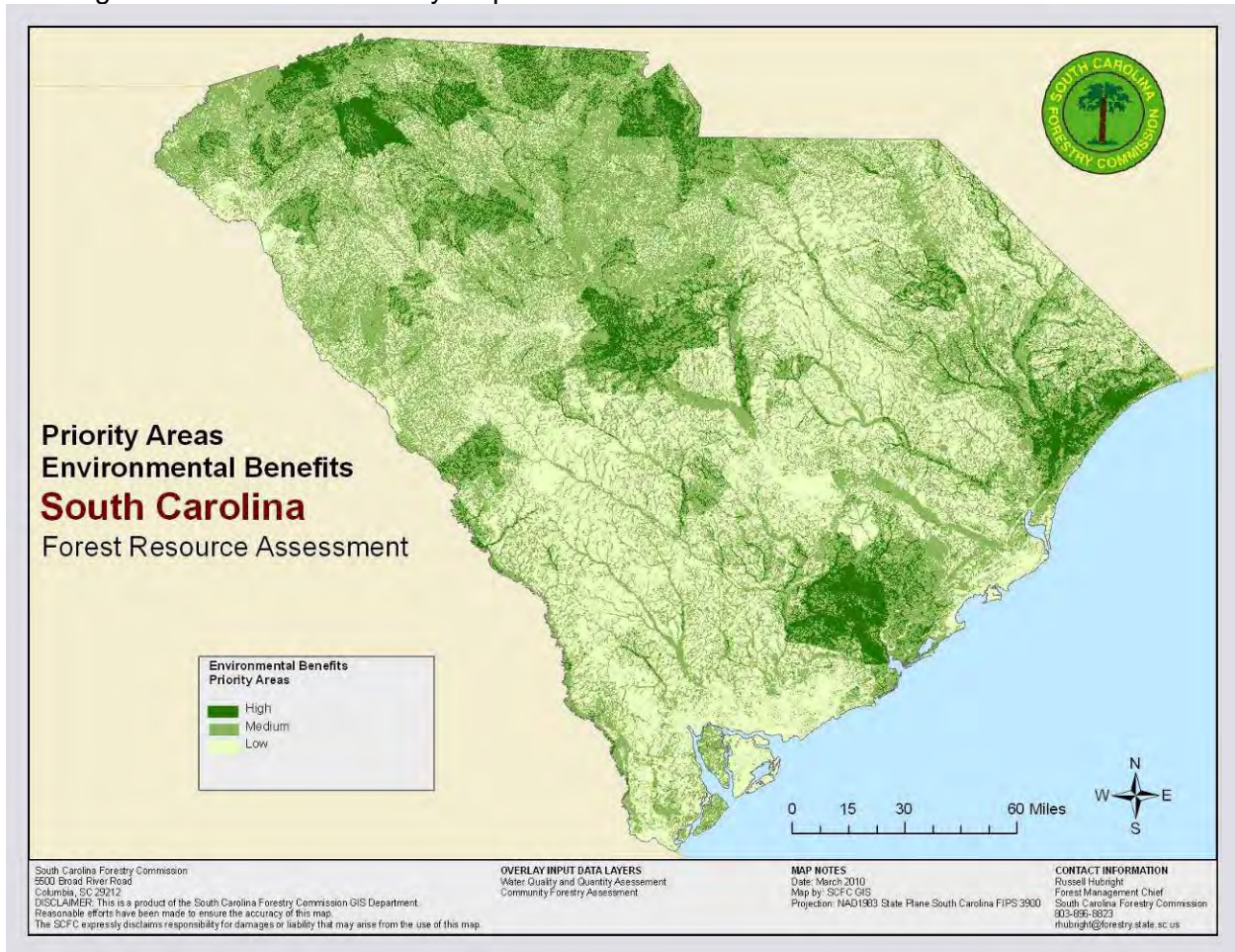


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## Priority Map

Figure xx: Combined Priority Map for Environmental Benefits of Trees and Forests



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