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Enhancing the Benefits of South Carolina's Trees and Forests



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This section describes the role of community forests in South Carolina as well as the benefits that forests and trees provide in protecting the quality of air and water in the state.

Water Quality and Quantity

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14 Stakeholders indicated that water quality and water quantity were high priority issues. Surface
15 water that is free from pollutants and sediment and provides habitat requirements for wildlife is
16 considered to be of high quality. Water is a critical resource affecting all aspects of quality of
17 life, from health and recreation to economic development.

18

19 Managing forests and trees has the potential to impact water quality and water availability
20 throughout the state. South Carolina is 67 percent forested land, and a significant portion of the
21 state's water resources are linked to healthy forests.

22

23 Compared to other land uses, the negative impacts of forest management activities on water
24 quality are minor, with silviculture the lowest leading source of impairment in Southern states.
25 Timber harvesting is viewed by some as a source of water pollution, but normally leaves
26 understory and organic material in place, and results in little disturbed or exposed soil (USFS
27 2002). In general, forests produce the highest water quality and most stable streams of any
28 land use (Myers et al. 1985).

29

30 Sediment is typically the greatest nonpoint source pollutant. The average annual sediment yield
31 from land in the southeast is 1.3 tons per acre.

32

33

Table xx : Sources of sediment by land use type

Land Use	Sediment Yield (tons/acre/year)
Undisturbed Forest	trace - .32
Careful Clearcut	.06 - .17
Careless Clearcut	1.35
Mechanical site prep	5.60 - 6.36
Cultivated field	.42 - 7.50
Careless Agriculture	7.80 - 43.06
Active Construction	48.40 – 218.91

34

(Source: Yoho 1980)

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36

37 Several classifications may indicate desirable water quality. These include state and federally
38 designated scenic rivers, Outstanding Resource Waters, and waters supporting threatened and

39 endangered aquatic wildlife. Trout waters and source drinking water further indicate quality
40 water resources that may need special management considerations. Headwater streams are
41 especially important for water quality, and isolated wetlands present unique habitats for
42 biodiversity.

43
44 The greatest risk of impact from forestry operations is typically sediment from roads and stream
45 crossings. Failure to follow Best Management Practices (BMPs) in riparian areas can result in
46 increased turbidity or sediment, water temperature, nutrient levels, and lowered dissolved
47 oxygen. Most water-quality impacts are temporary or short-lived, are minimized or mitigated
48 when BMPs are applied, and the site recovers within two to three years as vegetation grows
49 (USFS 2002). Maintaining forested land use and application of BMPs is important in riparian
50 areas to maintain the current high standard of water quality. BMPs are designed to address
51 most conditions, but adjustments are sometimes needed for waters with high richness or uses.

52
53 Although negative water quality impacts from forestry are minor, some forestry activities can
54 have a significant impact if not carried out properly. Considerable research has shown use of
55 Best Management Practices to be successful in controlling and preventing nonpoint source
56 pollution during forestry activities (USFS 2002).

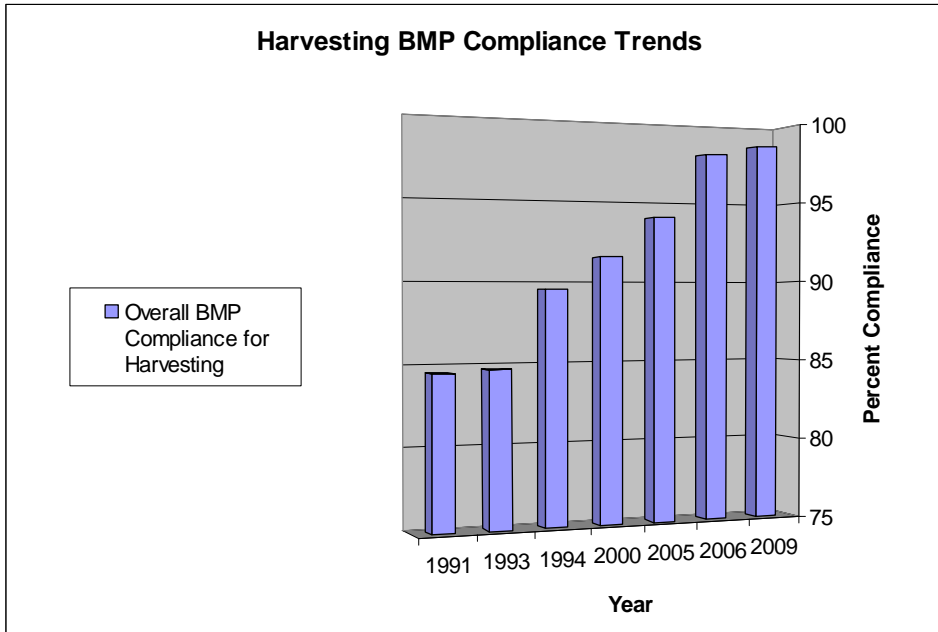
57
58 The SC Forestry Commission is the state agency designated to provide oversight and guidance
59 for forest management practices and to establish BMPs for forestry. The agency provides
60 educational opportunities and technical assistance through a BMP Courtesy Exam program
61 designed to improve compliance and implementation. The forest industry in South Carolina has
62 a strong commitment to support logger compliance with BMPs.

63
64 The BMP Courtesy Exam program offers free services to identify potential environmental
65 impacts from forestry operations. Specially-trained BMP Foresters visit sites before, during, and
66 after operations to offer recommendations and ensure applicable BMPs are being followed.
67 Courtesy exams are initiated on request, but sites may also be located by complaint, incident, or
68 through aerial detection. Failure to implement BMPs may result in regulatory violations that are
69 reported to the appropriate enforcement agency for possible action. In addition, forest industry
70 will often take action when suppliers fail to comply with BMPs. Many mills will not accept wood
71 from loggers who have been cited for failure to comply with BMPs.

72
73 Overall compliance with South Carolina's Best Management Practices for Forestry is 98.6
74 percent for timber harvesting operations. This indicates that the South Carolina BMP Program
75 is highly successful, and that landowners, loggers, and forestry professionals demonstrate a
76 strong commitment to protecting water quality (Sabin 2009). The regional average among 13
77 southeastern states for overall BMP compliance during harvesting is 89 percent (SGSF 2008).
78 Harvesting compliance in South Carolina has shown continual improvement since the first
monitoring study was started in 1989.

79

Figure xx: Compliance with BMPs related to forest harvesting operations



80

81 From *Compliance and Implementation Monitoring of Forestry Best Management Practices for Harvesting in South*
82 *Carolina, 2007-2008.*

83

84 The SC Forestry Commission provides further assistance to help landowners protect water
85 quality by providing forest management plans, cost-share assistance, and reforestation advice.
86 Commission foresters routinely offer information on all aspects of resource management,
87 including BMPs. South Carolina's BMPs for Forestry are applicable for all silvicultural activities,
88 with specific guidelines for timber harvesting, road construction, stream crossings, riparian
89 buffers, wetlands, site preparation, reforestation, prescribed burning and firelines, pesticide and
90 fertilizer application, wildlife improvements, and minor drainage.

91

92 The SC Department of Health and Environmental Control (DHEC) has identified areas with
93 significant threats to water quality. These designations are based on the state 303(d) listing of
94 impaired waters and watersheds with current or in-process Total Maximum Daily Loads
95 (TMDLs)¹. Impairment may result from a wide range of sources and pollutants. Although none
96 of these impaired areas in South Carolina are directly linked specifically to forestry activity,
97 opportunities may exist to mitigate or buffer impacts from other uses by using forested buffers.
98 In these areas forest management can capture, absorb, detain, or retain pollutants and
99 contribute to cleaner, healthier water.

100

101 Watershed features can also affect water quality. Certain features can lead to greater risk of
102 negative impacts and suggest the need for additional attention. Past land uses are sometimes
103 a consideration, especially where they have left the surface eroded, gullied, and/or barren.
104 Other features to address include slope, erodible soils, riparian areas, and wetlands.
105 Occurrence of these features may indicate a higher potential for negative impacts from forestry
106 activities. Evaluation of the water quality indicators previously mentioned provides additional
107 knowledge on watersheds that warrant prioritization to conserve high quality water resources,
108 mitigate impaired water quality, and support areas where threats are greatest.

109
110 Managing water resources is the responsibility of many state and federal agencies, and is the
111 focus for many other organizations, businesses, and citizens. For example, the SC Forestry
112 Commission has a Memorandum of Agreement with (and regularly cooperates with) the US
113 Army Corps of Engineers on silvicultural water quality issues under jurisdiction of the SC
114 Pollution Control Act and Clean Water Act. In addition, the Forestry Commission's BMP
115 Courtesy Exam Program is supported by a US EPA Section 319 grant administered by DHEC.

116
117 An issue of such wide-ranging importance to both society and the environment requires an
118 interdisciplinary and multi-jurisdictional approach involving many partners and stakeholders.
119 For example, the SC Forestry Commission provides technical expertise, experience, and
120 resources on the role of forestry in water quality. The agency can also seek new partnerships
121 and strengthen communications with existing partners to focus on water issues within the state.
122 In addition, the Commission can promote the use of tree cover and forest management to
123 protect water quality and streambank stability from adjoining land uses.

124
125 A closely-related, high-profile subject has been water quantity and availability. In recent years,
126 related issues have included water rights, reservoir management, in-stream flow needs, and
127 drought. Industrial, agricultural, and human consumption of water are often at odds, competing
128 for limited available resources. Indigenous aquatic life and other beneficial water uses are also
129 considerations.

130
131 South Carolina has an abundant supply of freshwater, but is not immune to water quantity
132 issues. Inter-basin transfers and years of drought have led to disputes with neighboring states
133 over water use. Most of South Carolina's major rivers are shared with North Carolina and
134 Georgia. Dams, diversions, canals and other hydrologic modifications alter the natural path of
135 water, creating varied positive and negative effects to ecosystems and society. Groundwater
136 supply is also an issue, especially in the coastal plain. Surface and groundwaters are
137 connected, but with varying degrees of intensity relative to recharge and discharge.

138
139 Although forests play an important role in providing clean water, issues of water quantity are
140 largely beyond the traditional scope of the SC Forestry Commission. However, forests provide
141 most of the available potable water and serve as the most efficient water filters. With
142 responsibility for overall forest resource management in South Carolina, the SC Forestry
143 Commission has a role to play in helping protect water quality. Timber harvesting can result in
144 increased water yield for several years until new growth is established. Depending on the
145 circumstances, conversion of forests or cover types may increase or decrease stream flow.
146 Where ownership and goals within a watershed match, forest management can be used to
147 affect water yield. With adequate funding, the SC Forestry Commission would be in a good

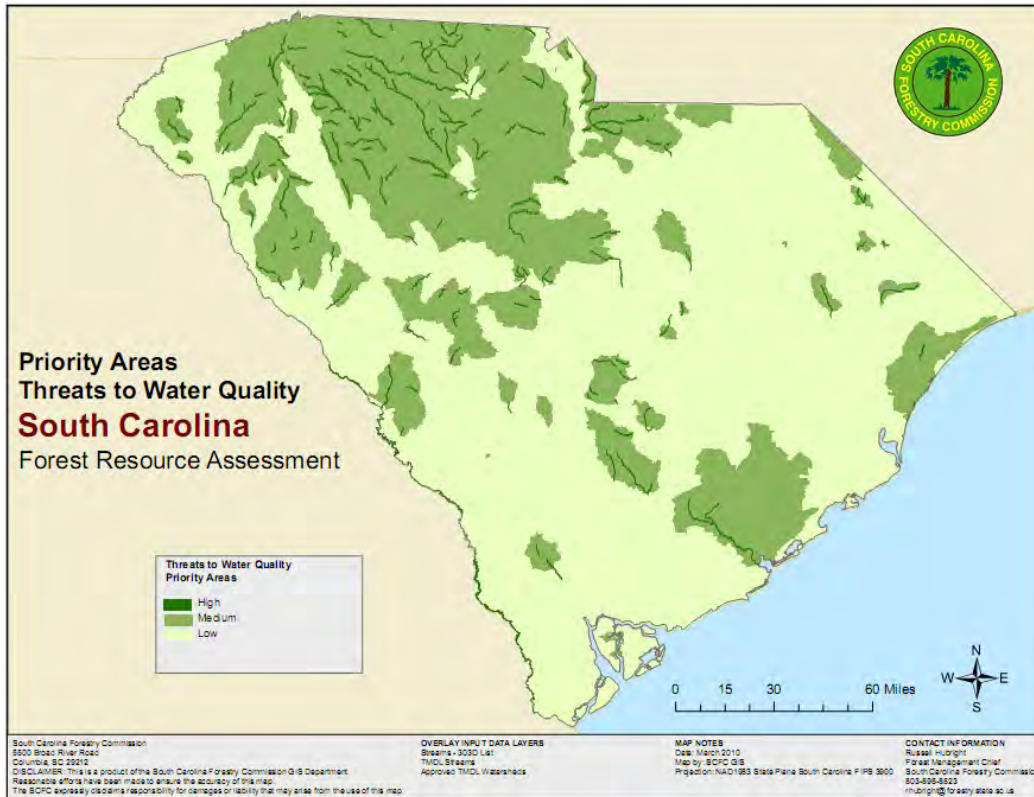
148 position to highlight the types and persistence of water yield changes that can occur in
149 connection to forests and their management and lead in managing the impact of forests on
150 water quality and quantity.

151
152 Opportunities for the SC Forestry Commission also include additional work with partner
153 agencies and emphasis on the importance of forestry for sustained water resources,
154 conservation, and stewardship.

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156 **Priority Maps**

157 Figure xx : Priority areas for threats to water quality



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Figure xx : Priority areas for quality water resources

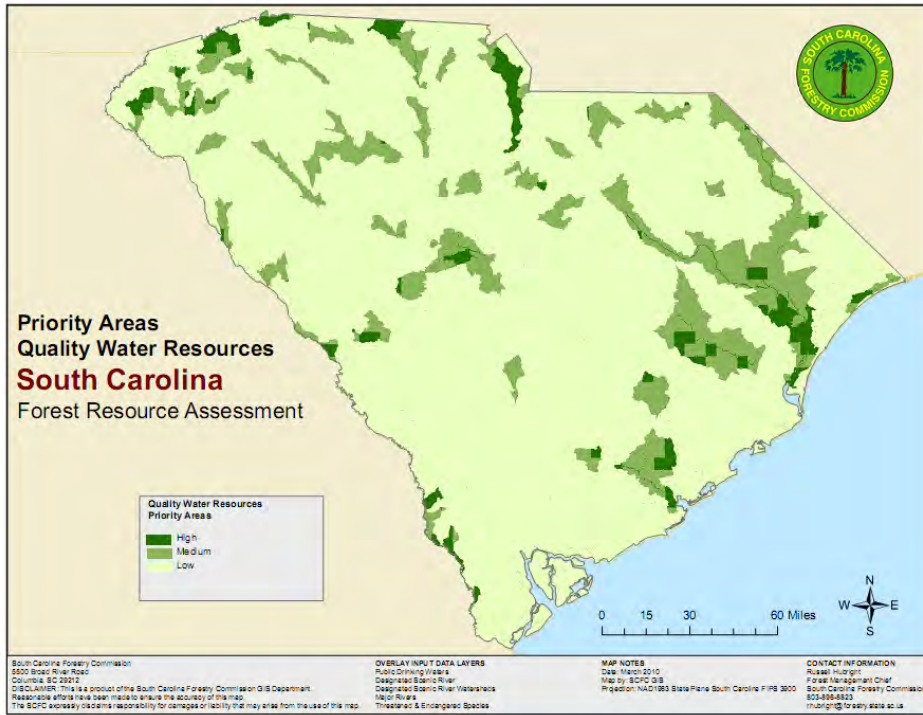
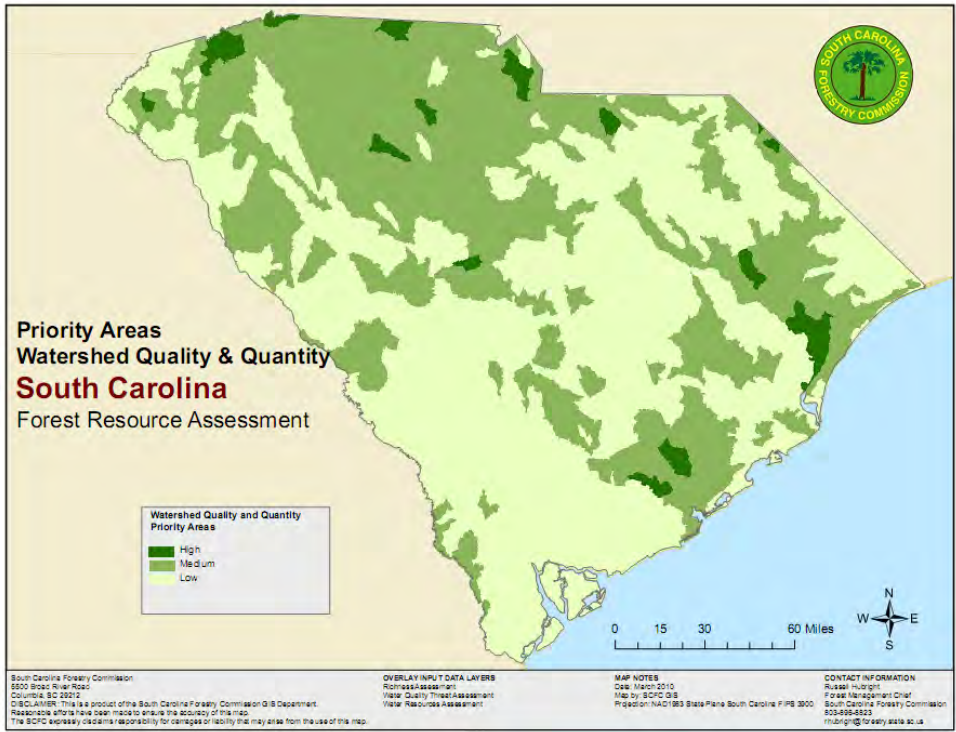


Figure xx : Overall priority areas for water quality and quantity



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192 **Glossary**

193 ¹TMDL – Total Maximum Daily Load - written quantitative analysis of water quality for a pollutant
194 at one or more sites in a watershed. (source: DHEC – available online at
195 <http://www.scdhec.gov/environment/water/regs/r61-110.pdf>)

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