

# FORESTRY BMPs

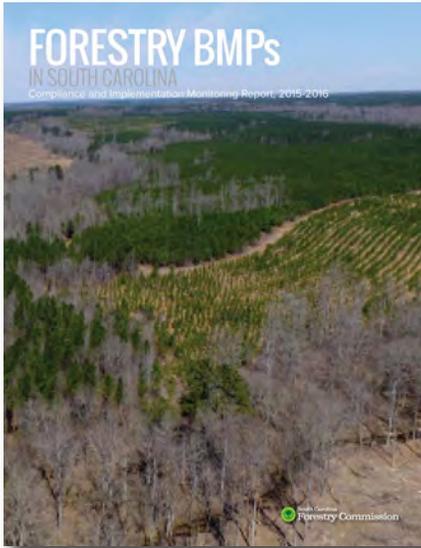
## IN SOUTH CAROLINA

Compliance and Implementation Monitoring Report, 2015-2016



South Carolina  
Forestry Commission

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*Compliance and Implementation Monitoring of Forestry  
Best Management Practices in South Carolina 2015-2016*

Prepared by

**Herb Nicholson**

Environmental Program Manager  
South Carolina Forestry Commission

*Best Management Practices Monitoring Report*

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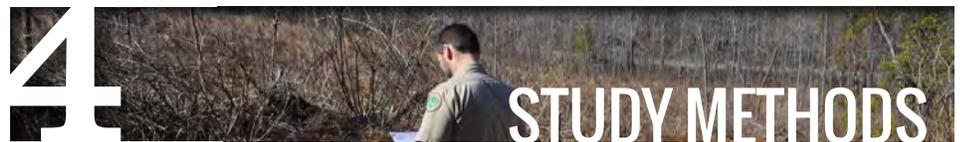
This project was funded in part by the U.S.  
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of Health and Environmental Control.



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# EXECUTIVE SUMMARY

This is the 10th study conducted by the South Carolina Forestry Commission to determine compliance with South Carolina's Best Management Practices for Forestry (BMPs) during silvicultural activities. Recent forestry operations were evaluated on 199 randomly located sites during 2015-2016. Overall BMP compliance on harvesting operations was 97%. Compliance indicates that proper use of applicable BMPs was sufficient to protect water quality on those sites. The overall implementation rate of individual BMP practices was 95.5%, compared to the regional average of 92% among southeastern states (Southern Group of State Foresters, 2012).

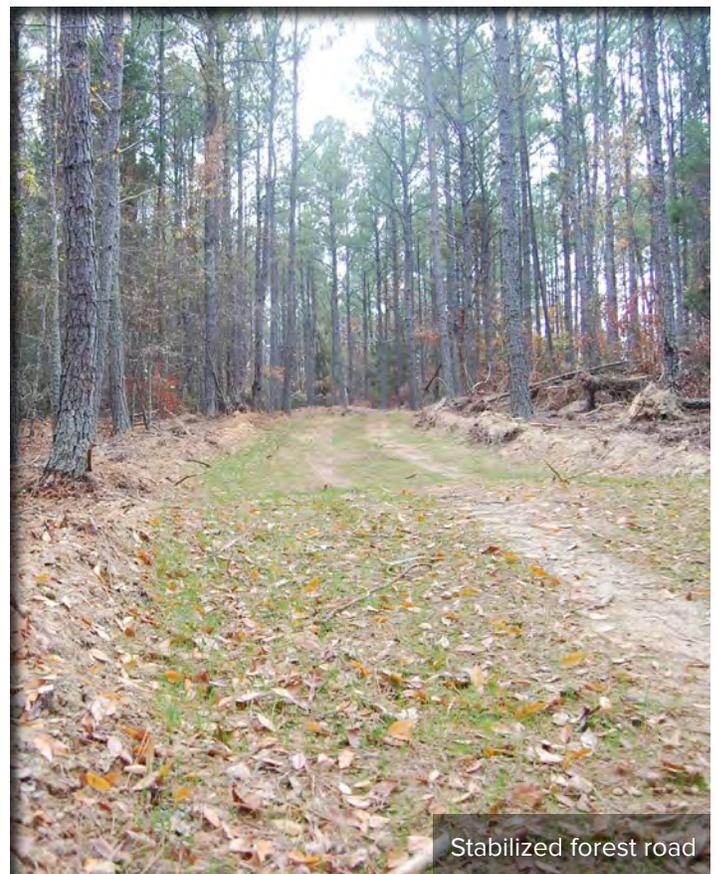
This study highlights numerous strengths in BMP compliance:

- ▶ Improved landowner awareness of BMPs, and increasing use of written contracts that require BMP compliance;
- ▶ High overall compliance with BMPs to protect water quality during forestry operations;
- ▶ Excellent compliance with road systems which often have a high potential for water quality impacts;
- ▶ Streamside Management Zones are frequently wider than the minimum recommendations on perennial and intermittent streams.

Opportunities for improvement include:

- ▶ Stream crossings present the greatest opportunity for improving compliance.
- ▶ The most important individual practices for improvement are:
  - Stabilize disturbed soil at stream crossings;
  - Avoid altering flow in ephemeral areas;
  - Properly size and install culverts;
  - Prevent unnecessary stream crossings;
  - Keep road and ditch runoff out of streams;
  - Control erosion on skid trails;
  - Protect intermittent and ephemeral streams during skidding;
  - Avoid excessive rutting;
  - Take steps to prevent depositing mud on roads.

The results of this study will be used to target training programs, outreach, and technical assistance to seek continual improvement in BMP compliance and implementation in South Carolina, and further advance successful protection of water quality during forestry operations.



Stabilized forest road



# INTRODUCTION

The South Carolina Forestry Commission promotes compliance with South Carolina's Best Management Practices for Forestry (BMPs) through training programs, BMP Courtesy Exams, technical assistance, and regular monitoring. The BMP program is funded in part by the U.S. Environmental Protection Agency (EPA) under a Section 319 nonpoint source pollution control grant through the South Carolina Department of Health and Environmental Control (DHEC).

Additional support for BMP compliance is provided through forest industry, including the Sustainable Forestry Initiative (SFI) Program and Timber Operations Professional (TOP) logger training program. Partners such as the South Carolina Forestry Association, the South Carolina Timber Producers Association, Clemson University, and the U.S. Forest Service contribute to a successful program. Relationships with regulatory agencies including the SC Department of Health and Environmental Control, the U.S. Army Corps of Engineers, and the Environmental Protection Agency also strengthen BMP compliance.





# STUDY METHODS

During 2016 and 2017, 199 forestry activities performed in 2015 and 2016 were evaluated for compliance and implementation of BMPs. A regional protocol for a consistent, credible, and statistically valid reporting process is presented in “Silviculture Best Management Practices Implementation Monitoring – A Framework for State Forestry Agencies,” (Southern Group of State Foresters Water Resources Committee, 2007). This survey meets or exceeds all standards of the regional protocol.

## Sample Size

Sample size was determined using the “Statistical Guide for BMP Implementation Monitoring,” (SGSF Water Resources Committee, 2006). With an estimated implementation rate of 90%, a sample size of 144 sites would be needed to achieve the desired 5% margin of error within the 95% confidence interval. Based on the sample size and results, actual margin of error was calculated to be 3.84%.

## Site Selection

To minimize bias, sites were selected using the LandSatFACT program which detects changes in forest cover using satellite images (see more about LandSatFACT in Appendix). First, a target number of survey sites were identified for each county in proportion to the annual timber harvest reported in the 2014 US Forest Service Timber Product Output data. Silvicultural activities selected were at least 10 acres in size and conducted within the previous one year. No association with streams or wetland areas was required to be included as a monitoring site. Within each county, a random number generator was used to select half of the identified sites for inclusion in the study. In Horry, Charleston and Greenville counties, many sites were harvested and converted from a forested land use to development. Additional sites were located in these counties in order to evaluate forestry BMP implementation on the allocated number of sites. The survey included 174 clearcut and 25 thinning/partial harvest operations.

## Landowner Questionnaire

Once a site was selected for inclusion in the monitoring study, the local BMP Forester contacted the landowner to obtain permission to visit the site. Prior to the site inspection, each landowner was questioned about their level of familiarity with Forestry BMPs, use of a professional forester, and use of a written contract. Four categories of landowners were identified for the purpose of this study:

1. Non-industrial private landowners who own less than 1,000 acres of forestland;
2. Non-industrial private landowners who own more than 1,000 acres of forestland;
3. Public lands, owned or managed by local, state, or federal government;
4. Industrial lands, owned by forest products companies and timberland investment groups (TIMOs and REITs).

## Site Evaluation

Site inspections were done by four specially trained BMP Foresters. On each harvesting site up to 134 applicable BMPs were evaluated for successful implementation.

Each individual BMP practice was rated as Yes, No, Significant Risk, or Not Applicable.

- ▶ Yes – the individual practice was applicable and properly applied;
- ▶ No – the individual practice was applicable, but not applied or not applied correctly;

- ▶ Significant Risk – the individual practice was applicable, and failure to properly apply the practice will likely result in an adverse change in the chemical, physical, or biological condition of the waterbody;
- ▶ Not Applicable – the individual practice was not necessary for that site.

Based on these individual practices, five categories of BMPs were rated for compliance. Each category was rated based on whether compliance was sufficient to protect water quality, and provides an assessment of whether water quality impacts occurred on the site. BMP categories are:

1. Streamside Management Zones;
2. Stream Crossings;
3. Road Systems;
4. Harvesting Systems – Water Quality;
5. Harvesting Systems – Site Productivity;
6. Biomass Harvesting.



Overall BMP compliance for each site was determined after all individual practices and BMP categories were fully evaluated. Each site was given an overall rating of Excellent, Adequate, or Inadequate depending on the level of BMP compliance, as follows (see map on Page 16):

- ▶ Excellent Compliance – All recommended BMPs were implemented successfully, and no water quality impacts resulted from the operation. Significant additional steps were taken to stabilize the site, reduce potential impacts to water quality or site quality, or to mitigate aesthetic impacts;
- ▶ Adequate Compliance – Recommended BMPs were sufficiently implemented to prevent water quality impacts from the operation;
- ▶ Inadequate Compliance – Recommended BMPs were not implemented or were implemented without success. Likely water quality impacts were noted as a result of poor or improper BMP implementation.

## Compliance and Implementation

Determination of Excellent, Adequate, or Inadequate compliance with BMPs was closely linked with the likelihood or presence of water quality impacts, and was consistent with applicable state and federal water quality laws and regulations.

This study also includes implementation rates which refer to the percentage of applicable individual practices that were properly applied on the site. Therefore, the implementation rate indicates the level at which BMPs were properly applied, and the compliance rate indicates whether the applied practices successfully protected water quality.

## Quality Assurance Checks

The BMP coordinator performed quality checks on evaluated sites to ensure consistency. Checks were completed while monitoring was ongoing so any corrections could be immediately applied. Compliance ratings for BMP categories were highly consistent.



# MONITORING RESULTS

## FOR HARVESTING

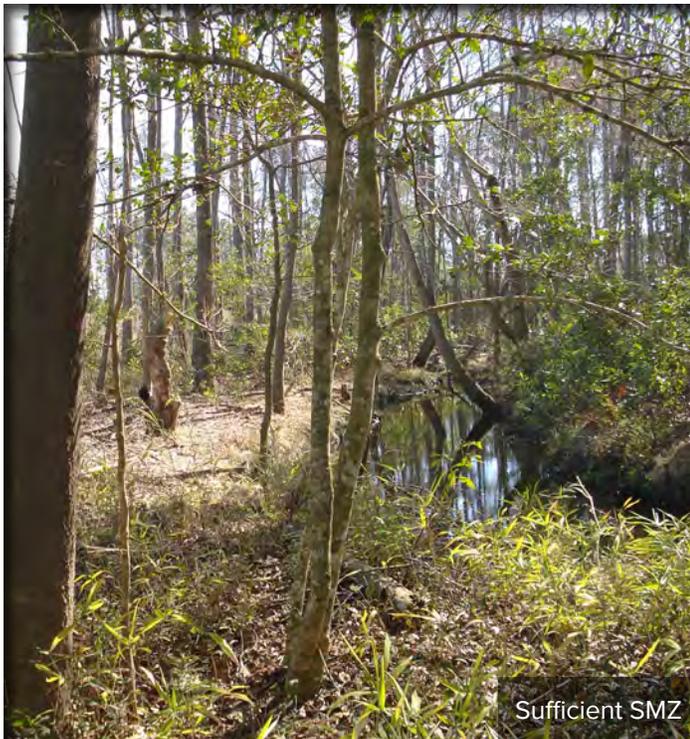
### **STREAMSIDE MANAGEMENT ZONES**

*98.9 % Compliance*

Perennial or intermittent streams were present on 41% of the sites included in this monitoring survey. The standard SC BMP recommendation for forested SMZ width on perennial streams is 40 feet. Perennial streams in the survey were found to have an average SMZ width of 60.25 feet and median width of 60 feet. A forested overstory is not required to be retained on intermittent streams. However, intermittent streams had a forested buffer averaging 35.4 feet wide. No trout waters or braided stream systems were identified in this survey.

Compliance with BMPs for Streamside Management Zones was sufficient to protect water quality on 98.9% of sites. Two sites were rated as having inadequate compliance in this category.

A total of 1,101 applicable BMPs were evaluated with 96.5% implementation. Thirty-eight individual practices were not properly applied. The most common deficiency was altering water flow in ephemeral areas. Additional concerns included excessive debris in stream channels, excessive rutting within the SMZ, skidding within ephemeral areas except at crossings, and avoiding emptying road runoff into ephemeral areas.



Sufficient SMZ



Inadequate SMZ

## STREAM CROSSINGS

73.6 % Compliance

Twenty-three stream crossings were evaluated on 19 different sites. Twelve crossings were culvert installations, five were fords, five were skidder debris crossings and one was a bridge installation. Compliance with BMPs for Stream Crossings was sufficient to protect water quality on 73.6% of sites. Five sites were rated with inadequate compliance in this category, with two posing significant risk.

A total of 130 applicable BMPs were evaluated with 83.8% implementation. Twenty-one individual practices were not properly applied, seven of those with significant risk. Major issues were failure to stabilize disturbed soil at crossings after construction, failure to keep road and ditch runoff out of streams at crossings, and improper sizing and installation of culverts.



Unstabilized crossing

## ROAD SYSTEMS

97.1 % Compliance



Blown out waterbars



Sufficient waterbar construction

Road systems were evaluated on 176 sites, with existing roads being used on all but 20 sites which had new road construction. No silvicultural wetland roads were evaluated. Compliance with BMPs for road systems was sufficient to protect water quality on 97.1% of sites. Five sites were rated with inadequate compliance in this category, with two rated significant risk.

A total of 704 applicable BMPs were evaluated with 95.0% implementation. Thirty-five individual practices were not properly applied, seven of those with significant risk. Primary concerns were failure to stabilize roads with water control structures after the operation and failure to stabilize exposed soil after construction. Culvert inlet and outlet stabilization and culvert maintenance also posed problems along with failure to avoid traffic on soft roads.

## HARVESTING SYSTEMS

97.0 % Compliance

BMPs for Harvesting are separated into practices related to water quality and those related to non-water quality on-site impacts. Harvesting was evaluated on all sites, and compliance with BMPs was sufficient to protect water quality on 94.1% of those. Compliance with BMPs was sufficient to prevent non-water quality site impacts on 100% of sites. The combined compliance rating for harvesting systems related to both water quality and on-site impacts was 97.0%.

A total of 2,190 applicable harvesting BMPs were evaluated with 95.9% implementation. Ninety individual practices were not properly applied, with three of those with significant risk.

Major deficiencies related to water quality were failure to control erosion on skid trails with waterbars or seed and a failure to remove temporary crossings in sloughs and ditches. Additional areas of concern include skidding over intermittent or ephemeral streams without appropriate protection, use of fill in debris crossings, avoiding sensitive areas, and failure to minimize the number of stream crossings. Primary concerns related to non-water quality impacts included failure to prevent depositing mud on roads, failure to stabilize skid trails with mats or debris to prevent excessive rutting, and failure to properly dispose of lubricants and trash.



Stable skid trail with debris



Unstable skid trail

## BIOMASS HARVESTING

100 % Compliance

For the first time in SC BMP program history, BMP compliance and implementation on biomass harvests was surveyed. Forest biomass harvesting recommendations for South Carolina were published in 2012 in response to an increased interest in biomass production at the time. For purposes of this survey, biomass is defined as above-ground woody material removed from forests for energy production.

Woody biomass is often a by-product of forest management, restoration, and fuel reduction treatments. Biomass harvesting may range from simple collection of accumulated logging debris to intensive removal of woody material specifically grown for biomass energy production. Biomass harvesting may be conducted at the same

time as conventional logging, as an intermediate treatment, or as a stand-alone practice. Woody biomass is chipped on-site before it is hauled to the mill and differs from “clean chips” which are used in fiber production.

Biomass harvesting occurred on only three of the 199 sites surveyed (1.5%). While this indicates the infrequent occurrence of biomass harvests, this sample size is not statistically significant to determine true compliance and implementation rates for biomass harvests.

Twenty-five applicable biomass BMPs were evaluated with 96% implementation. One individual practice was not applied properly. The biomass harvest was not planned to maintain a variety of habitat and age classes.



Two of the three sites were located in Aiken County and were in the Carolina Sandhills physiographic region. Given the location of facilities that utilize biomass material, it is reasonable to conclude that biomass harvests would be more heavily concentrated within the “wood basket” (approximately a 40-mile radius) of these mills (see facility map in appendix on Page 17).

## **OVERALL HARVESTING COMPLIANCE**

*97.0 % Compliance*

Overall BMP compliance on harvested sites was sufficient to protect water quality on 97.0% of sites. A total of six sites were found to have inadequate BMP compliance with potential water quality impacts.

On harvested sites, 4,150 individual practices were evaluated. Of that number, 3,965 practices were properly applied and 185 practices were not, including 12 of with significant risk. Total implementation rate for all practices was 95.5%.



# LANDOWNER AND SITE INFORMATION

Prior to site visits, contact was made with each landowner to request permission and ask questions about the activity on their property. Additional data was collected to look for relationships between BMP compliance and site factors such as physiographic region and soil texture.

All landowners reported using a written contract for their forest operation, which mirrors the 2012 results. In addition, nonindustrial private landowners with less than 1,000 acres reporting familiarity with BMPs increased from 41% to 65%. This indicates that landowner awareness and understanding of BMPs is growing, and that landowners and forestry professionals are increasingly likely to include BMP compliance in written contracts. Also, of the 152 non-industrial private landowners (NIPF < 1000 and NIPF > 1,000), 32 were already working with a South Carolina Forestry Commission forester for cost-share assistance.

The average harvest size was 63.05 acres, a slight increase from 61.2 acres in 2009. Timber harvesting activities were evaluated on a total of 12,548 acres during this survey.

Five of the six sites rated with inadequate compliance overall occurred in the Southern Piedmont physiographic region with an upland clay terrain type and a clay dominant soil texture. The other site rated inadequate occurred in the Southern Coastal physiographic region with a flatwoods terrain type and loam as the dominant soil texture.





# COMPLIANCE TRENDS

## Harvesting Compliance Trends

Overall compliance with BMPs during harvesting operations was 97.0% (Table 1). This represents an increase from 93.4% in 2012. The overall ratings indicate that landowners, loggers, and forestry professionals are committed to protecting water quality with proper application of Best Management Practices.

Overall Harvesting Compliance By Year

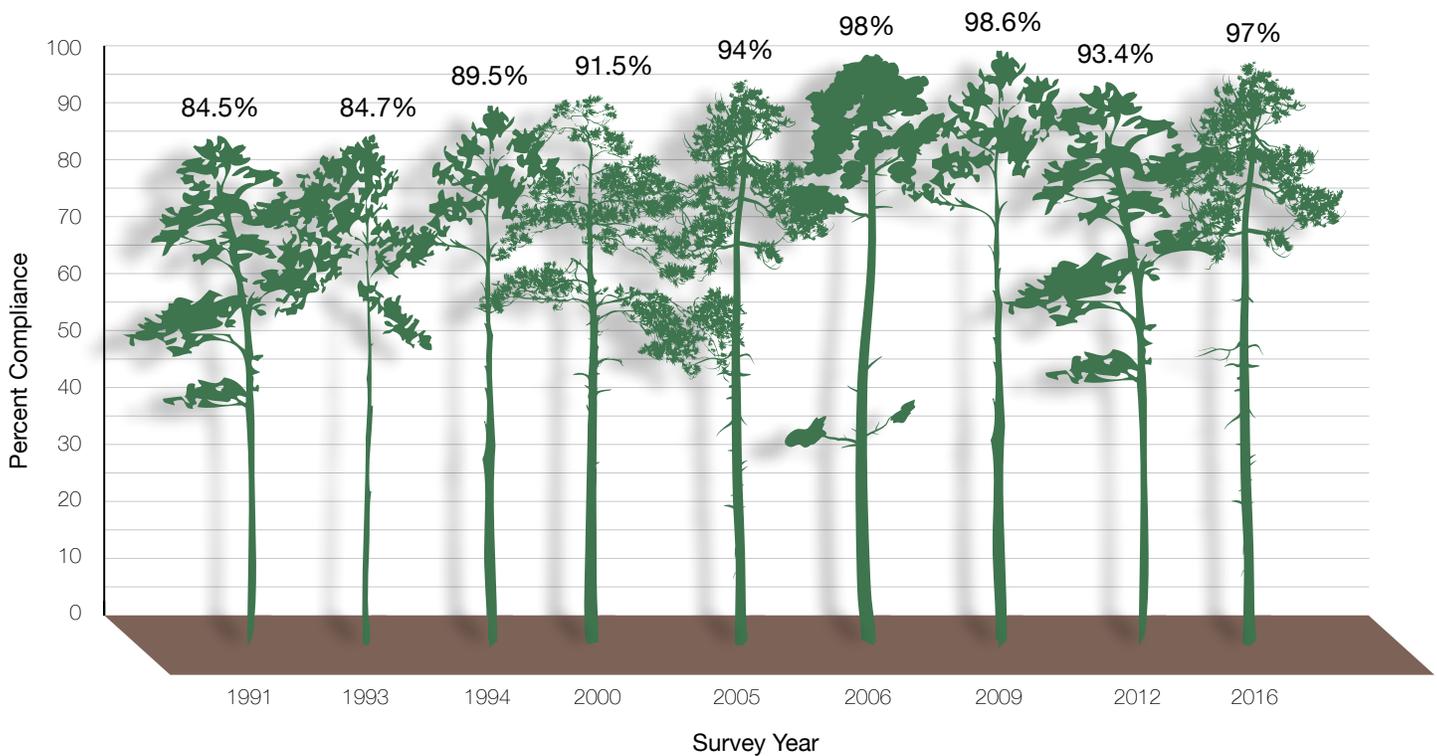
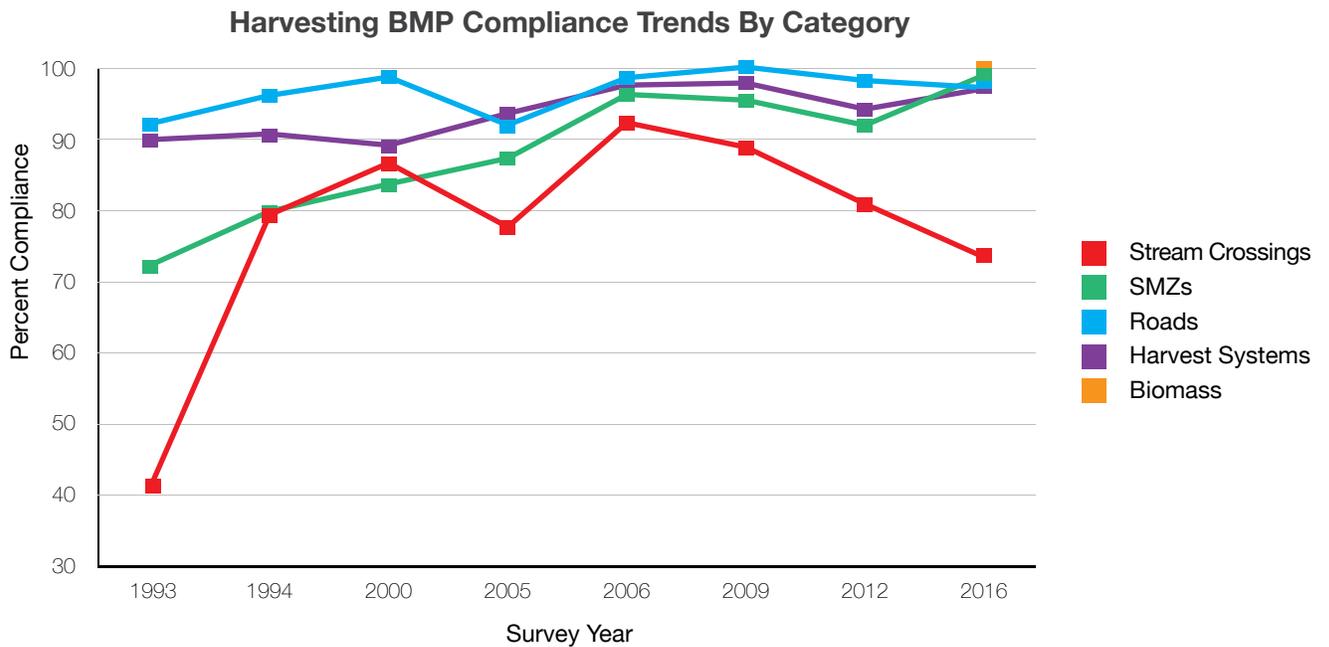


TABLE 1

The overall implementation rate for BMPs during harvesting operations was 95.5%, compared to the Southern regional average of 92%. Most states in the South report BMP implementation rather than compliance, so this number can be compared with regional results for 11 Southern states (Implementation of Forestry Best Management Practices: 2012 Southern Region Report, September 2012, Southern Group of State Foresters Water Resources Committee). Implementation of BMPs in South Carolina is consistent with the region.

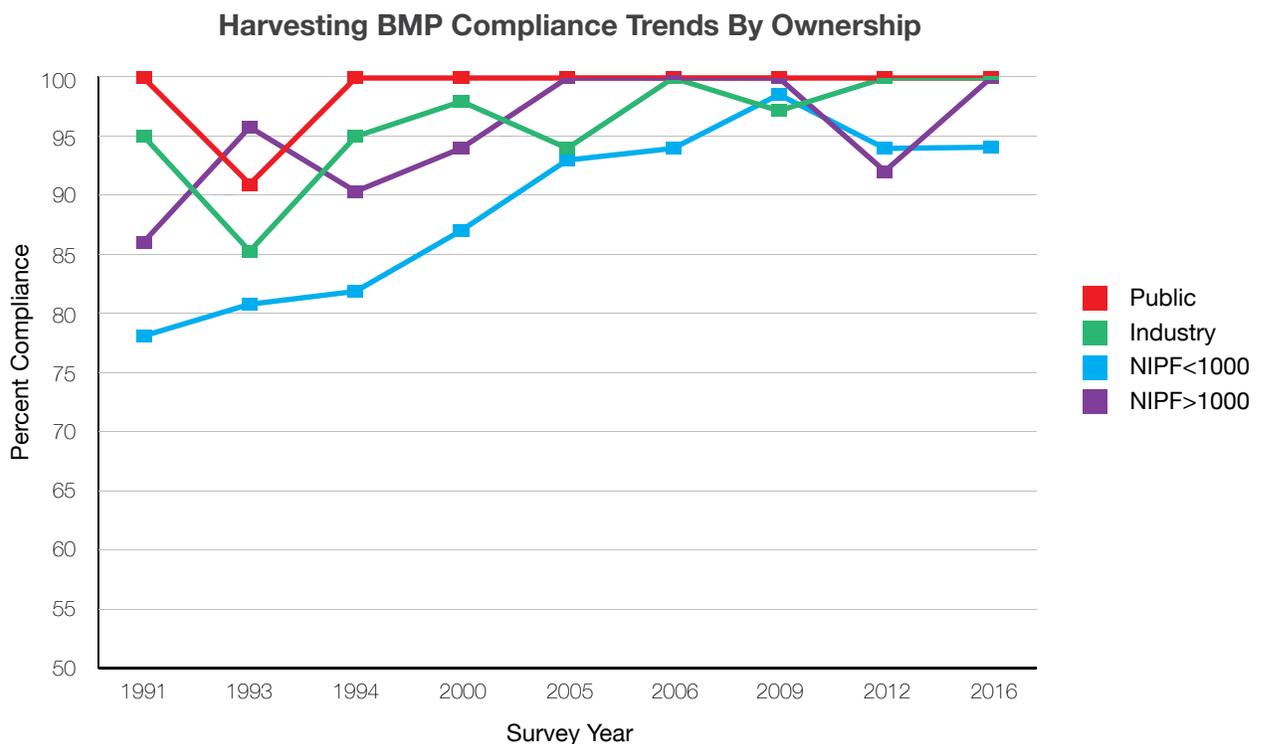
Every category except stream crossings had compliance above 97% (Table 2). Stream crossings have historically been the categories with lowest compliance, and continues to be the area with greatest opportunity for improvement. This category is critical for water quality protection since it often involves use of heavy equipment and soil disturbance near water bodies.

TABLE 2



Public, industrial, and large private (NIPF>1,000) ownerships demonstrate high levels of BMP compliance (Table 3). All six sites that were rated inadequate for overall compliance were found on smaller, private ownership. However, the NIPF<1,000 class still has a 94.1% compliance rate which remains the same as in 2012.

TABLE 3





# CONCLUSION

The results of this study demonstrate the continuing success of compliance and implementation with South Carolina's Best Management Practices for Forestry by landowners, loggers, and forestry professionals. This study highlights numerous strengths in BMP compliance:

- ▶ Improved landowner awareness of BMPs;
- ▶ High overall compliance with BMPs to protect water quality during forestry operations;
- ▶ Excellent compliance with Streamside Management Zones which often have a high potential for water quality impacts;
- ▶ Streamside Management Zones are frequently wider than the minimum recommendations on perennial and intermittent streams.

The results of this study will also be used to target training programs, outreach, and technical assistance to continually improve compliance. Opportunities for improvement include:

- ▶ Some BMPs are not frequently encountered in randomly selected sites. Wetland roads, trout streams, braided stream systems and biomass harvests may require further review;
- ▶ Stream crossings present opportunities for improving compliance;
- ▶ The most important individual practices for improvement are:
  - Stabilize disturbed soil at stream crossings;
  - Avoid altering flow in ephemeral areas;
  - Properly size and install culverts;
  - Failure to minimize the number of stream crossings;
  - Keep road and ditch runoff out of streams;
  - Control erosion on skid trails;
  - Protect intermittent and ephemeral streams during skidding;
  - Avoid excessive rutting;
  - Take steps to prevent depositing mud on roads.

The results of this study will be used to seek continual improvement in BMP compliance and implementation in South Carolina, and further advance successful protection of water quality during forestry operations.





# APPENDIX

## AND DATA FORMS

### **LandSatFACT Project Overview**

Forests of the South are constantly changing. Numerous projects completed and ongoing have identified, quantified or otherwise documented these changes at varying scales, frequencies, and durations.

The Southern Forest Futures Project forecasted that up to 22 million acres of forestland in the South will be lost to other land uses over the next 50 years. Changes to forest cover due to wildfire, prescribed fire, forest pests, non-native invasive plants, natural disasters, climate, harvesting, and conversion to other uses (e.g., urban, agriculture, etc.) greatly influence the Southern landscape. Timely information that helps identify where these changes are occurring is critically important to sustain short- and long-term efforts to manage, conserve, enhance, and restore forestland in the South.

Remote sensing and Geographic Information System (GIS) technologies are more frequently being used to assist with a variety of projects ranging from wildfire, disaster, and pest damage assessments to the identification of forest operations for Best Management Practices (BMP) monitoring. Utilizing a variety of satellite analysis methods, Landsat satellite imagery, and supplemental data, the Landsat Forest Area Change Tools (LandsatFACT) project is working to develop a web-based forest change detection system capable of near real-time analysis of imagery and distribution of simple-to-use products as frequently as biweekly.

The primary purpose of the LandsatFACT project is to support efforts to identify and quantify changes in forest cover as they occur across the Southern landscape and to provide the information to state forestry agencies and partners in a way that helps sustain efficient and effective program delivery, including:

- ▶ Responding to natural disasters;
- ▶ Assessing damage to forests following natural disasters;
- ▶ Reviewing and advising landowners harvesting timber;
- ▶ Assisting landowners and foresters with reforestation;
- ▶ Identifying and responding to forest health threats.

### **Technology Overview**

The Landsat program represents the longest running series of satellite missions dedicated to documenting the surface of the Earth from space. For over three decades, Landsat satellites have collected imagery recording land cover conditions over a majority of the globe. With each mission, the National Aeronautics and Space Administration (NASA) and the U.S. Geological Survey (USGS) have made advances in technology, improving the quality of imagery acquired, increasing the durability of the satellite platforms and sensors, and expanding the science involved in analyzing the imagery.

The LandsatFACT project is primarily designed to analyze satellite imagery from the two active Landsat missions - Landsat 7 (L7) and Landsat 8 (L8). However, custom requests can be submitted through the application that include

Landsat 5 (L5) data. Therefore, the possible analysis window for the LandsatFACT application(s) is from 1984 to present day.

Sensors on board each Landsat satellite (platform) have been designed to measure electromagnetic energy emitted by the Sun and reflected off of the Earth. These sensors are designed to measure energy within various wavelength ranges (or spectral bands) and the values recorded are indicative of the amount of energy reflected (or absorbed) within each wavelength range. A much more detailed description of the electromagnetic spectrum can be found on NASA's website.

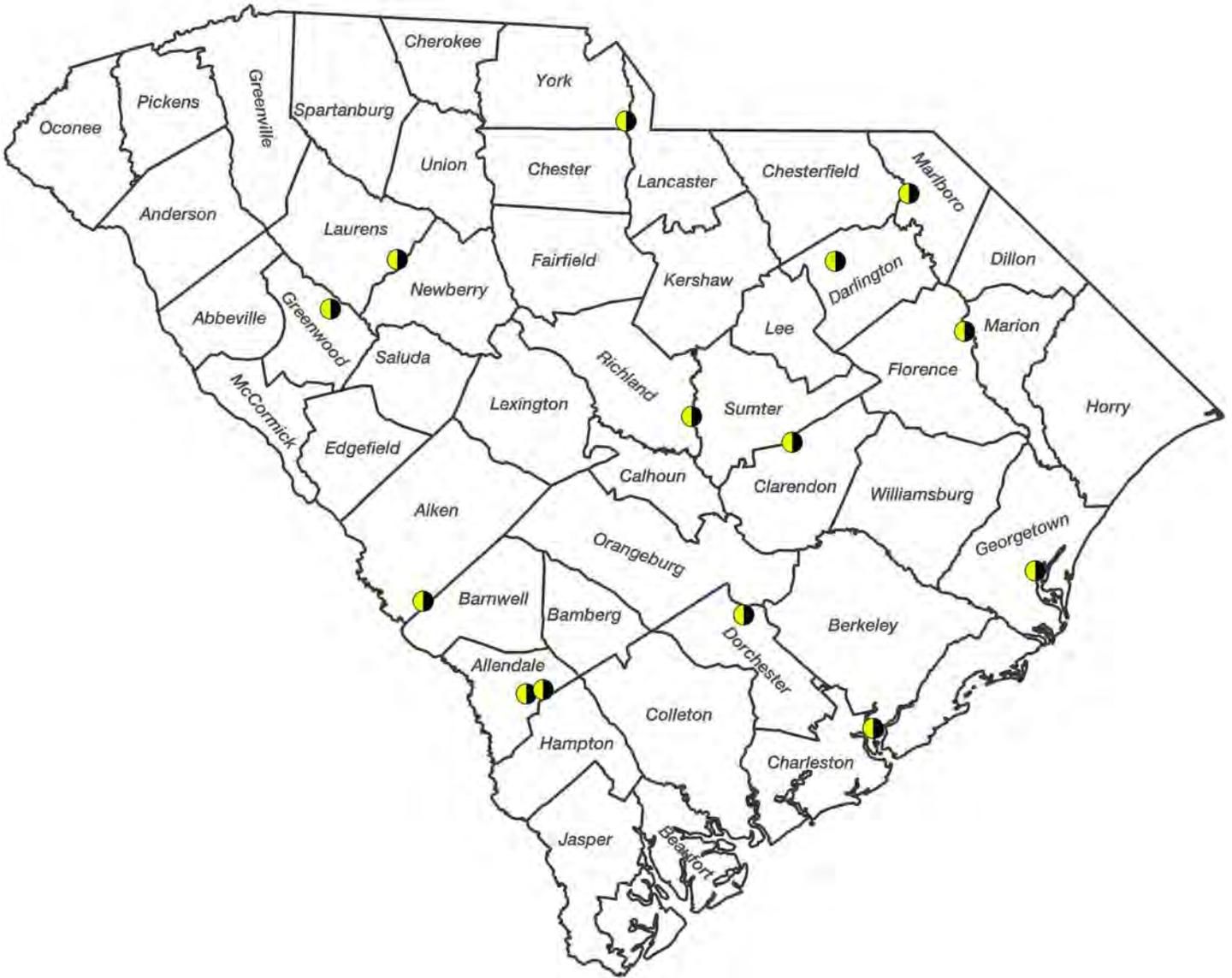
Landsat sensor technology has changed over time and as a result, L5, L7, and L8 satellites provide slightly different data. The table (right) provides a listing of the Landsat missions used in the LandsatFACT project, the sensor technology, wavelength range (band) names, the portion of the electromagnetic spectrum measured by each, and the spatial resolution of each band (i.e., horizontal ground units) [Source: USGS].

Additional information about Landsat measured wavelengths, including a visualization tool (Spectral Characteristics Viewer) to compare reflectance across platforms, can be found on the Landsat website.

\* The above information was found at [www.landsatfact.com](http://www.landsatfact.com).



# LOCATION OF SC BIOENERGY FACILITIES\*



\* These include pulp and paper facilities that take in roundwood, in-woods chips, chips and other primary material.

# Follow-up BMP Compliance Monitoring Form

Site ID Number: \_\_\_\_\_

## LANDOWNER QUESTIONNAIRE

|                             |                                      |                                   |
|-----------------------------|--------------------------------------|-----------------------------------|
| Landowner Name _____        | Ownership Class _____                | Industry <input type="checkbox"/> |
| Landowner Address _____     | NIPF < 1000 <input type="checkbox"/> | Public <input type="checkbox"/>   |
| Landowner City, State _____ | NIPF > 1000 <input type="checkbox"/> |                                   |
| Landowner ZIP _____         |                                      |                                   |
| Landowner Phone _____       |                                      |                                   |

|  | Y                        | N                        | NA                       |
|--|--------------------------|--------------------------|--------------------------|
| Are you familiar with SC BMPs for Forestry?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did you rely on a forester during harvest?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was there a written contract for the harvest?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was BMP compliance required in the contract?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Will you allow SCFC to include your property in the monitoring project?                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did landowner request a copy of the completed form?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Do you wish to receive information from the SCFC about cost-share for site prep and reforestation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## SITE

|                                |                             |
|--------------------------------|-----------------------------|
| Acres treated _____            | Waypoint Number _____       |
| Date Logged _____              | Latitude _____              |
| County _____                   | Longitude _____             |
| Region _____                   | Courtesy Exam Site ID _____ |
| Date of field evaluation _____ |                             |
| Evaluator _____                |                             |

### Physiographic Region

Blue Ridge   
 Southern Piedmont   
 Carolina Sandhills   
 Southern Coastal   
 Atlantic Coastal

### Terrain Type

Upland Clay   
 Sandhills   
 Flatwoods   
 Bottomland   
 Carolina Bay

Dominant soil texture: Sand  Clay  Loam

|                                    | Y                        | N                        | NA                       |
|------------------------------------|--------------------------|--------------------------|--------------------------|
| Is the site predominantly wetland? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## STREAMSIDE MANAGEMENT ZONES

Stream Types Present: Perennial  Intermittent  Ephemeral  None

Average slope adjacent to perennial and intermittent streams: < 5%  5-20%  21-40%  > 40%

Recommended width of primary SMZ \_\_\_\_\_

Recommended width of secondary SMZ \_\_\_\_\_

Average width of SMZ on perennial streams \_\_\_\_\_

Average width of SMZ on intermittent streams \_\_\_\_\_

(estimate to nearest 5 feet if buffer < 50ft; nearest 10 ft if > 50)

Length of all streams (miles to nearest 1/10th) \_\_\_\_\_

|  | Y                        | N                        | SR                       | NA                       |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| On perennial streams was 50 BA retained evenly spaced?             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| On perennial streams with less than 50 BA were all trees retained? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Forest floor and banks protected on intermittent streams           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Were trees directionally felled away from the stream?              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was harvesting in SMZ done sufficient to minimize disturbance?     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was debris kept out of stream channel?                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Toxic and hazardous materials kept out of SMZ                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Decks located outside of SMZ                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road construction kept out of SMZ                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Excessive rutting avoided within SMZ                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fifteen percent or less soil exposed within SMZ                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Decks located outside ephemeral areas                              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skidding within ephemeral area avoided except at crossings         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|   | Y                        | N                        | SR                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Altering flow in ephemeral areas was avoided                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road construction avoided in ephemeral areas except crossings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoided emptying road runoff into ephemeral areas             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Trout Waters**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Trout waters present                                     | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |
| Wider primary SMZ retained (80' on slopes over 5%)       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Drainage structures do not divert water into streams     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Exposed soils within SMZ revegetated                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mulch, gravel, rock used to stabilize roads at crossings | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall SMZs sufficiently protected water quality        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**ROADS**

Road Types Present:                      Main access       Limited use       None   
Existing roads used       New roads constructed

**Planning**

|   | Y                        | N                        | SR                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Were sensitive sites avoided or identified when possible? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road designed to meet long range objectives               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roads located on ridge sides to ensure drainage           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roads follow contour with grades between 0 and 10 percent | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roads outloped in hilly terrain                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Travel width complies with BMPs (12-14' LU; 16-20' MA)    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Right of way daylighted where needed                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lowland roads less than 2 feet above normal grade         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Construction**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Culverts remove runoff from inside ditches on steep grades         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Culverts and structures large and frequent enough for water volume | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Adequate compacted fill on culverts                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Drainage structures empty into undisturbed forest floor            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoided construction of wider or longer roads than necessary       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Stabilization**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Culvert inlets/outlets stabilized where needed                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Exposed mineral soil stabilized after road construction where needed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Waterbars used to retire LU and MA roads                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Maintenance**

|   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Culverts maintained to prevent blockage           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road grading minimal in hilly terrain             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Traffic on soft roads prevented                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoided roads on ridges with poor drainage        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoided emptying road runoff directly into drains | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Wetland Road Construction**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Are wetland roads present?                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roads in waters of US kept to minimum number/length/width/height | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road fill minimizes discharges in US waters                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road fill prevents restriction of expected floods                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road fill properly stabilized to prevent erosion                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road construction minimized encroachment outside fill boundaries | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Vegetative disturbance in US waters minimized                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Movement and migration of aquatic life maintained                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Borrow taken from upland where feasible                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Threatened and Endangered species not affected by discharge      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Discharges avoided if alternatives exist                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Discharges located away from public water intakes                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Discharges avoided in shellfish production areas                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Discharges avoided near wild and scenic rivers                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Suitable clean fill material used free of toxics                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Temporary fills removed and area restored                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road height for LU and MA roads under 2 feet                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fill height at crossings lower than approaches                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fords have adequate rock bases                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|  | Y                        | N                        | SR                       | NA                       |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Bridges/culverts/fords allow for expected flows                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Soil stabilized at crossings of major runs                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Temporary crossings designed well and removed after operation      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Where necessary logs used as road base                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Dredge ditch constructed on upper side of road with cross drainage | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ditches do not carry water more than 1/4 mile                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roadside ditches designed to avoid wetland drainage                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall road system sufficiently protected water quality           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### STREAM CROSSINGS

|   | Y                        | N                        | SR                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Perennial or intermittent stream road crossings present   | <input type="checkbox"/> | <input type="checkbox"/> |                          |                          |
| Type and number of crossings:    Bridge ___    Culvert ___    Ford ___    Debris ___    Other ___ |                          |                          |                          |                          |
|   | Y                        | N                        | SR                       | NA                       |
| Stream crossings avoided where possible   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Streams crossed at right angles where possible  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Approaches to crossings kept gentle   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Drainage structures used to prevent road and ditch runoff into streams                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Culverts sized and installed following BMPs   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Disturbed soil at crossings stabilized soon after construction                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Soil fill avoided except with culverts  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Avoided altering flow of stream   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was ditch runoff kept out of stream at crossing?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Woody fill and temporary culverts removed   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall, road stream crossings sufficiently protect water quality                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### TIMBER HARVESTING

Harvest type:                      Clearcut       Thin/partial harvest       Salvage       Other

#### Planning

|   | Y                        | N                        | SR                       | NA                       |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Harvest planned to minimize number of stream crossings  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Crossings located where stream impacts would be minimal | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Decks located on the most stable soils                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Decks with fill kept to minimum size                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Sensitive areas were identified                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

#### Execution

|   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Were SMZs established adjacent to perennial or intermittent streams and lakes?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was excessive rutting minimized in floodplains bottomlands, and erosive slopes? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Did harvesting cease when turbid overland flow went off-site?                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Primary skid trails designed to skid logs uphill                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Flow on skid trails controlled with drainage structures                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Bladed skid trails meet LU road specs   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Primary skid trails on erosive slopes retired with waterbars or seed            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was equipment serviced away from water bodies or wetlands?                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Were skid trails kept out of SMZs and stream channels?                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skidding perpendicular to contour was minimized                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skid crossings on perennial or intermittent streams used adequate crossing      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skidding over intermittent or ephemeral channels was protected with debris      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Culverted crossings left in place when needed in 10yrs                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Was use of fill avoided in skid trail stream crossings w/ or w/o debris?        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

#### Follow-up

|   |                          |                          |                          |                          |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Temporary crossings/blockages in sloughs were removed             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall timber harvesting was sufficient to protect water quality | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

#### Site Productivity

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Surrounding land use wildlife habitat aesthetics planned for on larger clearcuts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|

|  | <b>Y</b>                 | <b>N</b>                 | <b>SR</b>                | <b>NA</b>                |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Skid trails planned to occupy least amount of area                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Site was logged when dry   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Amount and depth of rutting acceptable                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Low impact system used when logging wet sites                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Skid trails stabilized with mats or debris to prevent excessive ruts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Steps taken to avoid depositing mud on roads                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Conditions conducive to rapid regeneration                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fuel or oil spills cleaned immediately                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lubricants and trash disposed of properly                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall timber harvesting sufficient to maintain site productivity   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**BIOMASS**

|  | <b>Y</b>                 | <b>N</b>                 |  |  |
|--|--------------------------|--------------------------|--|--|
| Was a biomass harvest conducted on-site? | <input type="checkbox"/> | <input type="checkbox"/> |  |  |

**SMZs**

|   | <b>Y</b>                 | <b>N</b>                 | <b>SR</b>                | <b>NA</b>                |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Temporary crossings/blockages in sloughs were removed             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall timber harvesting was sufficient to protect water quality | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Harvest**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Alternate methods used for stabilization where debris not sufficient?        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Removal of stumps, roots, leaf litter, and forest floor for biomass avoided? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Biomass removal avoided on steep slopes (>30%) or erodible soils?            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Biomass removal on slopes >20% limited to reduce erosion?                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Productivity and Soil Nutrients**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Biomass harvest done in conjunction with normal logging when possible?                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Existing roads, skid trails, and landings used where possible?                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Biomass removal limited on sites with shallow soils, very sandy soils or low fertility | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Piling of residual or fine material that would impede regeneration avoided?            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Leaves, needles and branches retained to the degree possible?                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fertilizer, lime or ash added where nutrient depletion is a concern?                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Dead Wood, Wildlife Habitat and Biological Diversity**

|  |                          |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Biomass harvesting avoided in sensitive areas?                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Biomass harvest used to enhance habitat for rare, threatened or endangered spp.? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Snags retained where available and safe?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Down woody debris left in variety of sizes?                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Biomass harvest planned to maintain variety of habitat and age classes?          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall biomass harvesting sufficient to protect water quality                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Overall biomass harvesting sufficient to maintain site productivity              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Overall Rating**

**Excellent**

**Adequate**

**Inadequate**

**COMMENTS**

List major problems if Inadequate/Noteworthy positive and negative aspects for all

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# ADDITIONAL RESOURCES

South Carolina Forestry Commission. 2012. South Carolina's Best Management Practices Forest Biomass Harvesting Recommendations: A Supplement to South Carolina's Best Management Practices for Forestry.

Southern Group of State Foresters Water Resources Committee. 2006. Statistical Guide for BMP Implementation Monitoring. White Paper.

Southern Group of State Foresters Water Resources Committee. 2007. Silviculture Best Management Practices Implementation Monitoring A Framework for State Forestry Agencies. White Paper.

Southern Group of State Foresters Water Resources Committee. 2012. Implementation of Forestry Best Management Practices: 2012 Southern Region Report.

"Project Overview." [www.landsatfact.com](http://www.landsatfact.com). Southern Group of State Foresters, 2015. Web. 2 February 2017.

## SCFC REGIONS AND CONTACTS

### Statewide BMP Coordinator

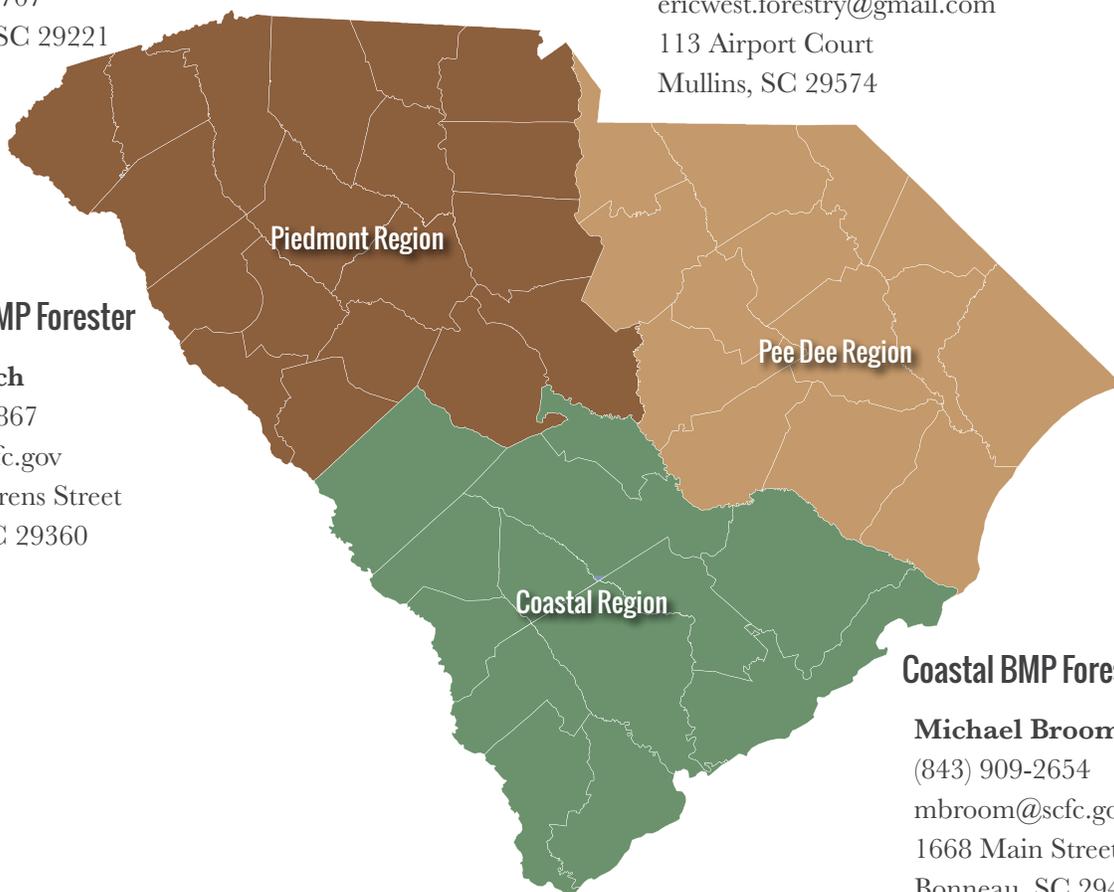
**Herb Nicholson**  
(803) 896-8593  
[hnicholson@scfc.gov](mailto:hnicholson@scfc.gov)  
P.O. Box 21707  
Columbia, SC 29221

### Pee Dee BMP Forester

**Eric West**  
(843) 382-6955  
[ericwest.forestry@gmail.com](mailto:ericwest.forestry@gmail.com)  
113 Airport Court  
Mullins, SC 29574

### Piedmont BMP Forester

**Holly Welch**  
(803) 667-0867  
[hwelch@scfc.gov](mailto:hwelch@scfc.gov)  
219 W. Laurens Street  
Laurens, SC 29360



### Coastal BMP Forester

**Michael Broom**  
(843) 909-2654  
[mbroom@scfc.gov](mailto:mbroom@scfc.gov)  
1668 Main Street  
Bonneau, SC 29431

