

Implementation of Forestry Best Management Practices:



2012 Southern Region Report



Prepared by:



SOUTHERN GROUP OF STATE FORESTERS

Water Resources Committee

September 2012

WATER AND THE SOUTHERN GROUP OF STATE FORESTERS

The Southern Group of State Foresters (SGSF) is a non-profit organization consisting of State Foresters from:

- ◆ Alabama
- ◆ Arkansas
- ◆ Florida
- ◆ Georgia
- ◆ Kentucky
- ◆ Louisiana
- ◆ Mississippi
- ◆ North Carolina
- ◆ Oklahoma
- ◆ South Carolina
- ◆ Tennessee
- ◆ Texas
- ◆ Virginia
- ◆ Puerto Rico
- ◆ U.S. Virgin Islands

SGSF Mission

To provide leadership in sustaining the economic, environmental, and social benefits of the South's forests.

We work together to identify and address issues and challenges that are important to southern forests and citizens, many of which have been assessed with each state's Forest Action Plan (www.forestationplans.org). A common theme of these plans among southern states was water quality and quantity. The SGSF has incorporated a goal into our Implementation Plan that recognizes the role of forests and forestry to the long-term sustainable supply of clean water in the south.

SGSF Implementation Plan - Goal 5 "Water Goal"

The SGSF will provide leadership and support to state agency programs that work to manage, conserve, restore, and enhance forests to provide a sustainable supply of clean water for economic, social, and ecological benefits.

The SGSF has identified several important actions to achieve this "water goal." One of those actions is to continue state forestry agency programs directed toward nonpoint source pollution, specifically: "promote the protection of soil and water resources through the development, adoption, and implementation of silviculture best management practices (BMPs) or other suitable measures." In order to achieve this component of our water goal, southern states will:

- ◆ Promote and encourage the use and proper implementation of Silviculture Best Management Practices (BMPs) through educational materials, training, technical assistance, incentives or other means necessary.
- ◆ Facilitate work to monitor, report, and demonstrate the implementation and effectiveness of silviculture BMPs.
- ◆ Support watershed research that focuses on developing effective BMPs, quantifying/modeling BMP efficiency, and increasing our overall understanding of forest hydrology.
- ◆ Document and report progress made in BMP implementation, load reductions, and water quality improvement.
- ◆ Promote science based silviculture that supports the conservation, sustainable management, and functionality of wetlands.

FORWARD

In order to improve and maximize the integrity of forestry Best Management Practices (BMP) implementation monitoring in the southeast, the Southern Group of State Foresters (SGSF) appointed a Task Force to develop recommendations for a more consistent approach to this activity in the region. Specifically, the Task Force was charged with developing guidance on monitoring BMP implementation that would be statistically sound, objective, and technically defensible. This framework was to achieve analytical consistency, making monitoring results and data generally comparable across the southern states.

In 1997, the Task Force completed the initial document titled *Silviculture Best Management Practices Implementation Monitoring – A Framework for State Forestry Agencies* (Framework). In 2002, this document was revised and re-published, and states began working toward conformance. As envisioned by the SGSF, one aspect of having multistate conformance with the Framework was the capability to compile BMP implementation data for participating states and periodically report this information at a regional level. Among other values, this “regional report” was expected to identify categories of BMPs for which implementation may need improvement throughout the region. It was further expected that those needs would then be addressed by the SGSF Water Resources Committee (WRC), through regional BMP training, demonstration, and information exchange.

In 2008, a small working group from the SGSF WRC solicited each of the southern states for all BMP implementation data that was collected in conformance with the Framework since 1997. This data was compiled, analyzed, and published in *Implementation of Forestry Best Management Practices: A Southern Region Report, 2008*.

As a way to assess the ongoing educational efforts since 2008, the SGSF WRC again convened a working group to produce an updated “regional report.” The same data request format was used for easy comparison of results and included data collected between 2007 and 2012. Eleven of the 13 states submitted data for inclusion in this report.

*Southern Group of State Foresters
Water Resources Committee
www.southernforests.org*

EXECUTIVE SUMMARY

Forty-four statewide monitoring surveys have been conducted since the initial development of the Framework in 1997, with 24 in the last five years. The number of surveys completed to date provides a useful dataset for determining BMP implementation across the region, as well as changes in state implementation, since the inception of the Framework.

For the seven BMP categories considered in this report, the lowest average implementation for the region was for Firebreaks (82 percent), and the highest average implementation was for Chemical Application (98.5 percent). The Harvesting, Forest Roads, Streamside Management Zone, Site Preparation, and Chemical Application categories all scored 90 percent or above, while Stream Crossings scored 89 percent.

Combining all BMP categories in all states, and using only the most recent survey data, the average overall BMP implementation for the southern region was 92 percent, up from 87 percent in 2008. The range of overall implementation reported by individual states for surveys included in this report was from 85 percent to 99 percent.

Change in BMP implementation has been positive across the region since the initial report in 2008. Most notably, BMP implementation in the Harvesting and Firebreak categories increased by seven percentage points and nine percentage points, respectively. All other BMP categories realized at least a one percentage point increase since the previous report.

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INTRODUCTION

Beginning in 1997, states in the southern region were introduced to a BMP monitoring protocol titled *Silviculture Best Management Practices Implementation Monitoring – A Framework for State Forestry Agencies* (Framework). At that time, states began working toward this monitoring approach. Currently, all states in the region are in conformance with the Framework. However, only 11 of the 13 states submitted eligible data for inclusion in this report.

The Framework calls for the evaluation of seven BMP categories: Harvesting, Forest Roads, Stream Crossings, Streamside Management Zones, Site Preparation, Firebreaks, and Chemical Application. In addition, conformance with the Framework requires that BMPs be evaluated at three implementation levels, including individual practice, category, and overall. In order to allow for regional comparisons, the Framework also asks that states express implementation as a percent.

As agreed to by the SGSF WRC, states in conformance with the Framework submitted BMP implementation monitoring data to a small working group. This data was to be extracted from all statewide surveys conducted in conformance with the Framework since the initial regional report published in 2008. For states that had not conducted monitoring since the initial regional report, their most recent data (2007) was used.

Since forestry practices are different across the region, not all states reported on all categories of BMPs referenced in the Framework. For example, forest chemical use in Tennessee is not common, therefore Tennessee did not report implementation monitoring data for this BMP category. Similarly, some states evaluate BMPs less frequently than others, resulting in disproportionate responses for certain BMP categories. Finally, BMP monitoring forms for states are organized differently with respect to the BMP categories called for in the Framework. For example, Harvesting is a BMP category referenced in the Framework, but North Carolina addresses “harvesting practices” throughout their BMP Manual, and captures these practices under multiple BMP categories during implementation monitoring. Consequently, for consistency in this report, regional criteria (shown below) for each of the seven BMP categories were developed.

- ◆ **Overall BMP Implementation** – Average of all BMPs evaluated
- ◆ **Harvesting** – BMPs for landings, skid trails, wetlands, and waste disposal
- ◆ **Forest Roads** – BMPs for permanent and temporary forest roads
- ◆ **Stream Crossings** – BMPs for stream crossings – permanent or temporary – haul or skidder
- ◆ **SMZs** – BMPs for SMZs
- ◆ **Site Preparation** – BMPs for site preparation and planting
- ◆ **Firebreaks** – BMPs for firebreaks – wildland fire pre-suppression or prescribed burn
- ◆ **Chemical Application** – BMPs for application of pesticides, fertilizers, or other chemicals

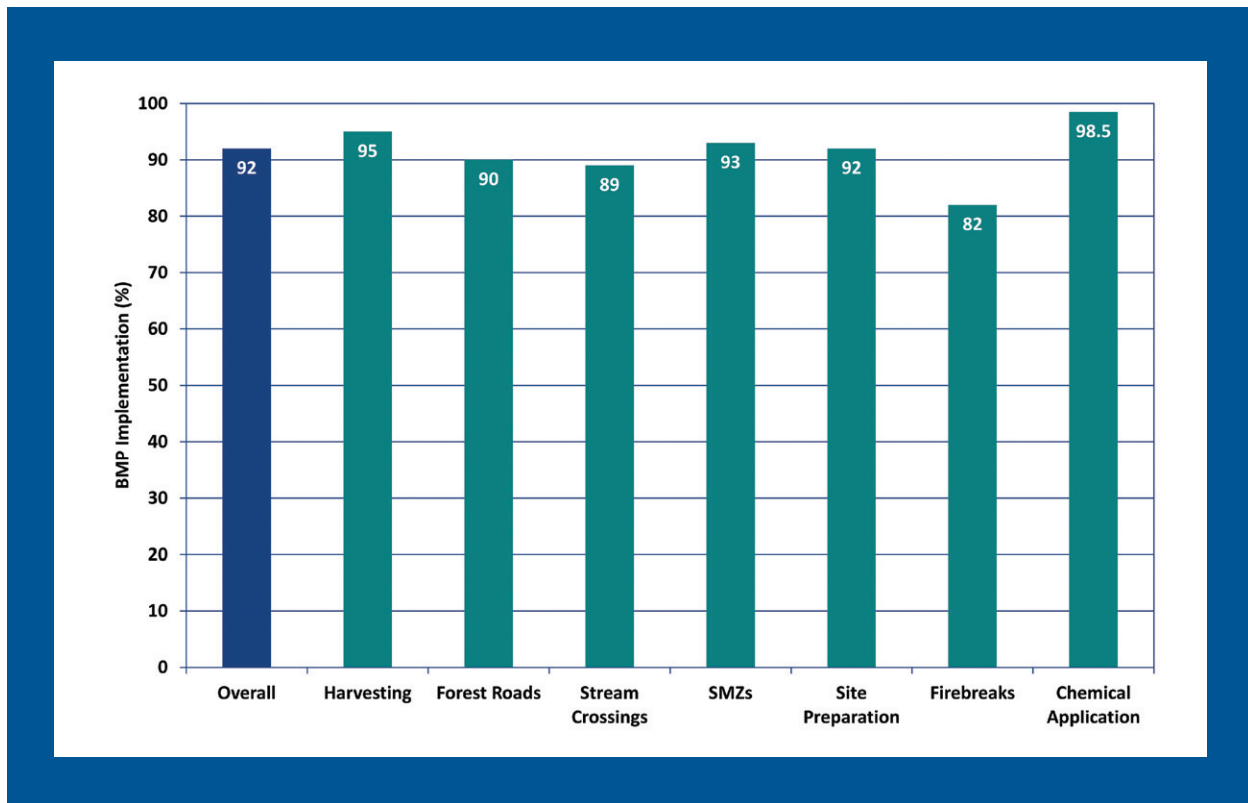
While there is extensive BMP implementation monitoring data across the region, direct state to state comparisons are difficult, given the natural variability in site characteristics, operational methods, and BMP specifications throughout the South. Table 1 on page 7 provides current and historical data to facilitate in-state comparisons.

FINDINGS

Overall BMP Implementation

The Overall Implementation statistic is reported for each site and accumulated for each survey. It includes all BMPs for a given forestry operation and is expressed as a percent of all applicable practices. Eleven states captured this statistic and responded with data (Figure 1). Overall implementation ranged from 85 percent to 99 percent for this reporting period, averaging 92 percent. In states where multiple surveys were reported, overall implementation showed a generally positive change. Figure 1 below illustrates the average regional BMP implementation by category using the most recent survey from each state.

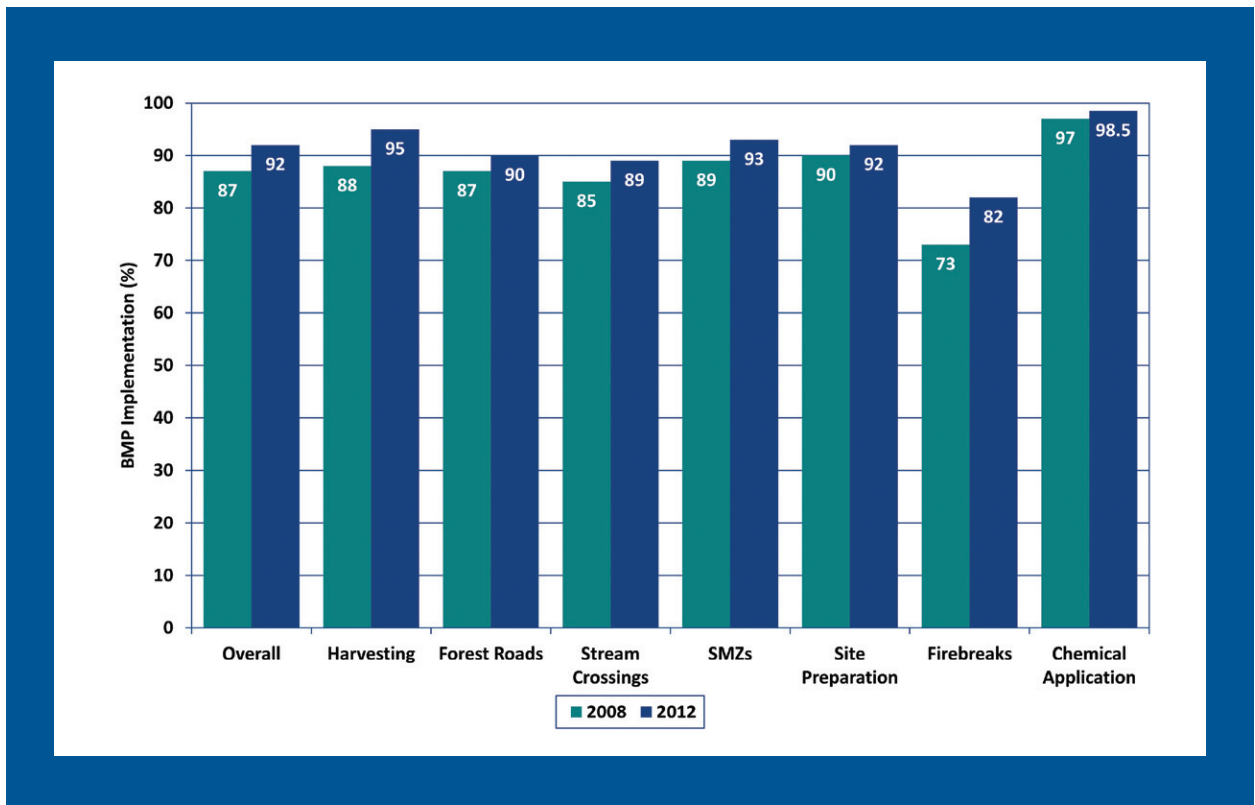
Figure 1. Average Regional BMP Implementation by Category



Regional Averages

Data reported by the individual states were analyzed to determine the current region-wide averages for overall BMP implementation and the seven BMP categories (Figure 2). This data was then compared to the region-wide average of the 2008 report to identify any change. The current overall BMP implementation average for the southern region is 92 percent, representing an increase of five percentage points since the initial survey (2008). Regional BMP implementation averages increased for all categories with notable improvement occurring in Harvesting (increase of seven percentage points) and Firebreaks (increase of nine percentage points). Figure 2 below illustrates the average regional BMP implementation by category from the previous regional report (2008) compared to the most recent survey data used in this report (2012).

Figure 2. Comparison of Average Regional BMP Implementation by Category – 2008 vs. 2012



Implementation of BMPs by Report Category

The following information addresses the data submitted by the states for each BMP category required by the Framework. A brief description of the category is provided below along with the average score and the range of responses.

Harvesting

The Harvesting category includes BMPs that address forestry activities, such as skidding, landings, wetlands, slash disposal, and timber felling. Eleven states captured harvesting BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 85 to 99 percent with a regional average of 95 percent. In states where multiple surveys were reported, implementation of Harvesting BMPs showed a generally positive change.

Forest Roads

The Forest Roads category includes BMPs that address forestry activities, such as road construction, road maintenance, and runoff/erosion control. Eleven states captured Forest Road BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 78 to 99 percent with a regional average of 88 percent. In states where multiple surveys were reported, implementation of Forest Road BMPs showed a generally positive change.

Stream Crossings

The Stream Crossing category includes BMPs that address forestry activities, such as culvert sizing and installation, construction of low-water crossings, and runoff/erosion control. This category includes both temporary and permanent as well as road and skidder crossings. Eleven states captured Stream Crossing BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 72 to 98 percent with a regional average of 89 percent. In states where multiple surveys were reported, implementation of Stream Crossing BMPs showed a generally positive change.

Streamside Management Zones (SMZ)

The SMZ category includes BMPs that address forestry activities in proximity to streams, rivers, lakes, and other water resource features. Eleven states captured SMZ BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 85 to 99 percent with a regional average of 93 percent. In states where multiple surveys were reported, implementation of SMZ BMPs showed a generally positive change.

Site Preparation

The Site Preparation category includes BMPs which address forestry activities that facilitate reforestation, such as shearing, chopping, raking, and bedding. Nine states captured Site Preparation BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 74 to 99 percent with a regional average of 92 percent. In states where multiple surveys were reported, implementation of Site Preparation BMPs showed a generally positive change.

Firebreaks

The Firebreaks category includes BMPs that address forestry activities, such as fireline construction, maintenance, and rehabilitation. While eight states captured Firebreak BMPs directly and responded with data, this category had the fewest number of sites, representing a relatively small sample size. For this reporting period, implementation ranged from 33 to 100 percent with a regional average of 82 percent. In states where multiple surveys were reported, implementation of Firebreak BMPs showed both positive and negative changes.

Chemical Application

The Chemical Application category includes BMPs that address forest chemical use, including pesticides, herbicides, and fertilizers, especially in close proximity to water resource features. Eight states captured Chemical Application BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 94 to 100 percent with a regional average of 98.5 percent. In states where multiple surveys were reported, implementation of Chemical Application BMPs showed a generally positive change.

SUMMARY

This regional report on forestry BMP implementation monitoring is the second in a planned series to be published every three to five years. The objective of the report is to provide information at a regional level, for the purpose of continuously improving monitoring methods and BMP implementation, and to promote consistency among states in the southern region for this activity.

BMP implementation in the southern region is a high priority with the state foresters, as reflected in the continued support and coordination of the SGSF WRC. Although the regional data identifies several BMP categories in need of improvement, an overall regional implementation rate of 92 percent is considered notable. Likewise, positive change has been made in every BMP category since the 2008 report. Specific BMP categories that should be targeted by the SGSF WRC for improvement are Firebreaks, Stream Crossings, and Forest Roads.

Individual states in which multiple surveys have been conducted in accordance with the Framework have also shown positive changes in BMP implementation (Figure 3 and Table 1). This is largely attributed to the numerous educational, outreach, and training efforts being conducted across the southern region by the states and their cooperators, and to the efforts of the SGSF through the Water Resources Committee.

Figure 3. Changes in Overall BMP Implementation by State

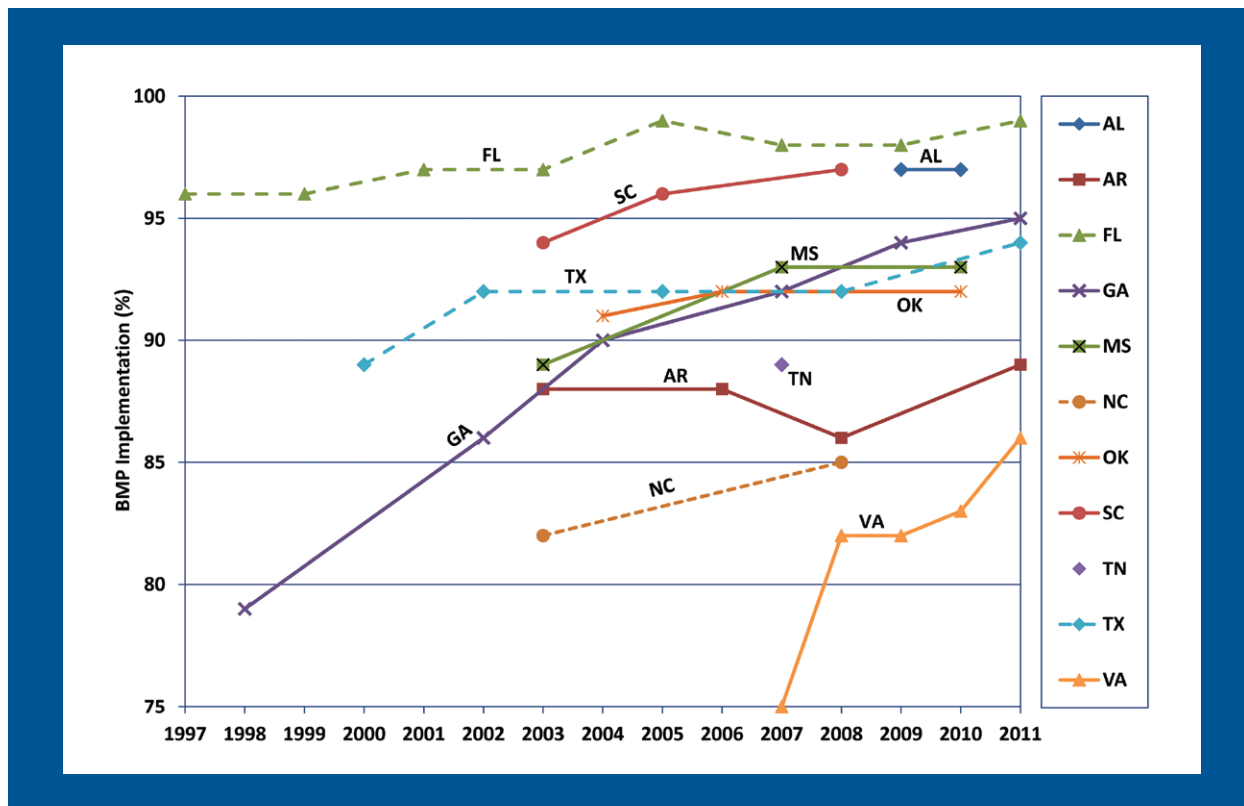


Table 1. BMP Implementation by State, Year, and Regional Category

Year	BMP Category							
	Overall BMP Implementation	Harvesting	Forest Roads	Stream Crossings	SMZs	Site Preparation	Firebreaks	Chemical Application
Alabama								
2009	97	96	93	96	92	98	90	100
2010	97	98	93	96	97	98	97	98
Arkansas								
2003	88	97	81	89	86	85	52	83
2006	88	96	85	90	81	86	55	87
2008	86	94	74	86	83	81	72	96
2011	89	97	85	84	86	74	80	100
Florida								
1997	96	98	91	93	99	97	97	100
1999	96	97	90	91	97	97	96	100
2001	97	98	94	93	96	96	98	99
2003	97	98	96	87	95	98	88	100
2005	99	99	98	100	99	99	95	99
2007	98	100	98	99	98	98	100	100
2009	98	99	98	96	97	99	95	100
2011	99	99	99	98	98	99	100	100
Georgia								
1998	79	87	77	59	81	97	30	99
2002	86	91	83	77	87	95	71	98
2004	90	94	89	81	91	99	85	100
2007	92	97	91	84	89	94	68	98
2009	94	98	90	90	97	88	88	100
2011	95	98	94	93	95	96	85	100

Year	BMP Category									
	Overall BMP Implementation	Harvesting	Forest Roads	Stream Crossings	SMZs	Site Preparation	Firebreaks	Chemical Application		
Mississippi										
2003	89	93	95	89	89	90	81	95		
2007	93	95	96	91	93	91	92	96		
2010	93	95	91	92	94	96	92	98		
North Carolina										
2003	82	76	80	64	87	NA	NA	99		
2008	85	85	86	72	91	NA	NA	94		
Oklahoma										
2004	91	96	82	90	97	93	100	100		
2006	92	98	83	91	97	90	50	100		
2010	92	96	85	93	96	97	33	100		
South Carolina										
2003	94	94	92	78	87	96	92	98		
2005	96	96	94	96	96	NA	NA	NA		
2008	97	96	95	94	99	NA	NA	NA		
Tennessee										
2007	89	93	91	80	85	90	NA	NA		
Texas										
2000	89	98	84	67	86	96	96	100		
2002	92	97	90	85	88	90	88	95		
2005	92	97	92	81	91	95	96	100		
2008	92	98	92	82	88	98	100	100		
2011	94	99	96	85	90	98	89	98		

Year	BMP Category									
	Overall BMP Implementation	Harvesting	Forest Roads	Stream Crossings	SMZs	Site Preparation	Firebreaks	Chemical Application		
Virginia										
2007	75	78	70	77	82	60	NA	NA	NA	NA
2008	82	79	79	81	81	NA	68	100	100	100
2009	82	82	75	83	86	80	70	88	88	88
2010	83	85	74	82	86	81	74	NA	NA	NA
2011	86	86	78	87	91	81	76	NA	NA	NA

REFERENCES

Regional Reports

Best Management Practices (BMP) Monitoring Task Force. 2007. *Silviculture Best Management Practices Implementation Monitoring*. In: *Implementation of Forestry Best Management Practices: A Southern Regional Report*. Appendix 1. Southern Group of State Foresters, Water Resources Committee. Available online at: www.southernforests.org/publications/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication_2007.pdf.

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State BMP Manuals

Table 2 below provides an online link to the most current forestry BMP manual for each state in the southern region.

Table 2. Online Links to the Most Current State Forestry BMP Manuals in the Southern Region

State	Year Published	Online Link
Alabama	2007	www.forestry.state.al.us/Publications/BMPs/2007_BMP_Manual.pdf
Arkansas	2002	arkforests.org/PDFs/BestManagementPractices.pdf
Florida	2011	www.floridaforestservice.com/publications/silvicultural_bmp_manual2011.pdf
Georgia	2009	www.gfc.state.ga.us/resources/publications/BMPManualGA0609.pdf
Kentucky	2001	www.ca.uky.edu/forestryextension/Publications/FOR_FORFS/FOR67.pdf
Louisiana	2007	www.ldaf.state.la.us/portal/Portals/0/FOR/for%20mgmt/BMP.pdf
Mississippi	2008	www.mfc.ms.gov/pdf/Mgt/WQ/Entire_bmp_2008-7-24.pdf
North Carolina	2006	ncforestservice.gov/water_quality/bmp_manual.htm
Oklahoma	2008	www.forestry.ok.gov/Websites/forestry/Images/documents/WaterQuality/Oklahoma%20Forestry%20BMPs%202008.pdf
South Carolina	2007	www.state.sc.us/forest/bmpmanual.pdf
Tennessee	2003	www.tn.gov/agriculture/publications/forestry/BMPs.pdf
Texas	2010	txforestservice.tamu.edu/sustainable/BMP_Manual
Virginia	2011	www.dof.virginia.gov/wq/resources/ManualBMP/2011_Manual_BMP.pdf

State BMP Implementation Reports

Table 3 below provides an online link to where forestry BMP implementation information for each state in the southern region can be obtained.

Table 3. Online Links to Forestry BMP Implementation Information in the Southern Region

State	Online Link
Alabama	www.forestry.state.al.us/bmpmon.aspx?bv=2&s=1
Arkansas	forestry.arkansas.gov/Services/ManageYourForests/Pages/bestManagementPractices.aspx
Florida	www.floridaforestservice.com/forest_management/hydrology_index.html
Georgia	www.gfc.state.ga.us/forest-management/water-quality/bmps/index.cfm
Kentucky	www.ca.uky.edu/forestryextension/publications_BMPS.php
Louisiana	www.ldaf.state.la.us/portal/Offices/Forestry/ForestManagement/BestManagementPractices/tabid/232/Default.aspx
Mississippi	www.mfc.ms.gov/water-quality.php
North Carolina	ncforestservice.gov/water_quality/wq_bmp_studies.htm
Oklahoma	www.forestry.ok.gov/h2o-compliance-monitoring
South Carolina	www.state.sc.us/forest/menvir.htm
Tennessee	www.tn.gov/agriculture/forestry/waterquality.shtml
Texas	tfsweb.tamu.edu/BMPMonitoring
Virginia	www.dof.virginia.gov/wq/monitoring.htm



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