Implementation of Foresty
Best Management Practices

2018 SOUTHERN REGION REPORT

SOUTHERN

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FORESTERS

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2018 SOUTHERN REGION REPORT

Talimena Scenic Drive, Oklahoma

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 the report Implementation of Forestry Best Management Practices: A Southern Region Report, 2012.

Recognizing the value of these periodic "regional reports", SGSF and many cooperators requested the WRC publish updated versions every 5-7 years as a way to promote continual improvement throughout the region. This report represents data collected in accordance with the Framework since 2012.
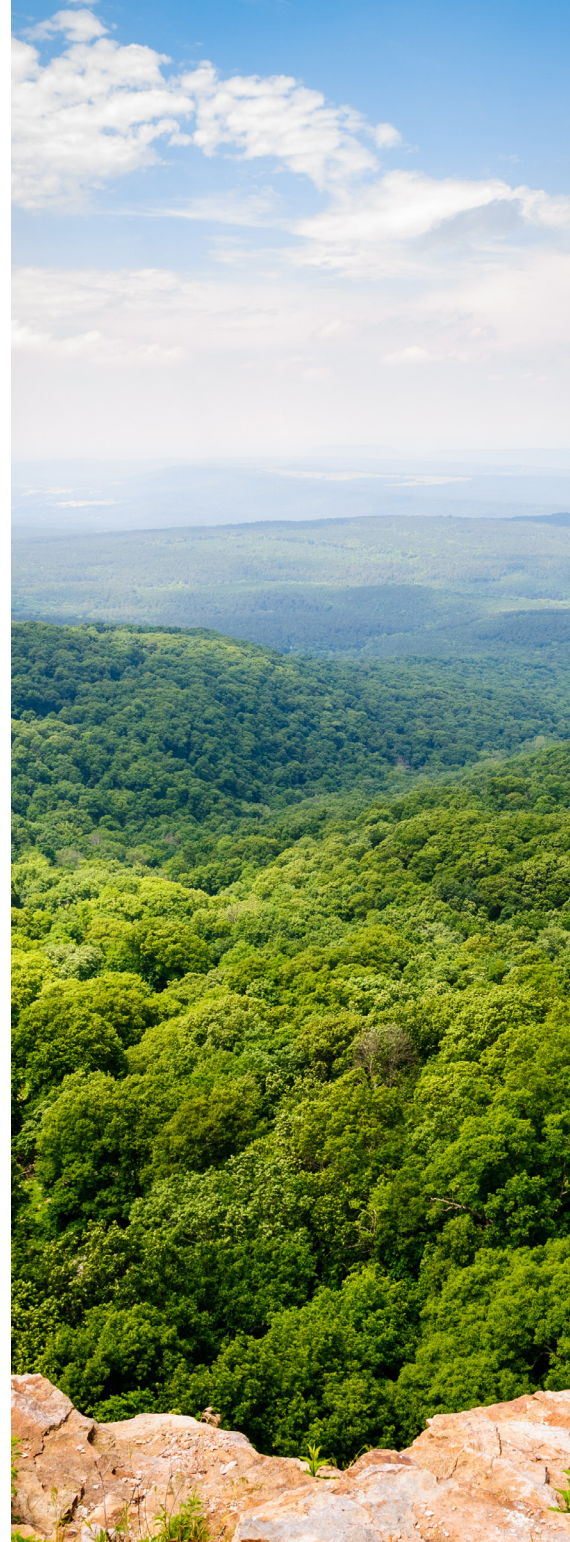
EXECUTIVE SUMMARY

Sixty-seven statewide monitoring surveys have been conducted since the initial development of the Framework in 1997, with 23 in the last six 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 (84.4%), and the highest average implementation was for Site Preparation / Planting (96.6%). All other categories (Harvesting, Forest Roads, Streamside Management Zones, Chemical Application, and Stream Crossings) scored 91.6% or higher.

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 93.6%, up from 92.0% in 2012 and 87.0% in 2008. The range of overall implementation reported by individual states for Surveys included in this report was from 84.0% to 99.6%.

Change in BMP implementation has continued a positive, upward trend across the region since 2012. Most notably, BMP implementation in the Stream Crossing and Forest Roads categories increased by five percentage points. While two categories (Chemical Application, Harvesting) realized slight declines, all other categories showed positive gains over the previous report, including the Overall category which was up by almost 4 percentage points.

Mount Magazine State Park, Arkansas

*Implementation of Forestry Best Management Practices: **2018 Southern Region 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). Currently, all states in the region are in conformance with the Framework. However, due to program funding declines and staff vacancies, two states have not conducted monitoring since the last 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 were to be extracted from all statewide Surveys conducted in conformance with the Framework since the 2012 regional report. For states that had not conducted monitoring since the last regional report, their most recent data was used in this analysis.

Since forestry practices are different across the region, not all states reported data for 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, though 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*
- *Streamside Management Zone (SMZ) – 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.

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. Twelve states responded with data (Figure 1). Overall implementation ranged from 84.0 % to 99.6 % for this reporting period, averaging 93.6%. 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
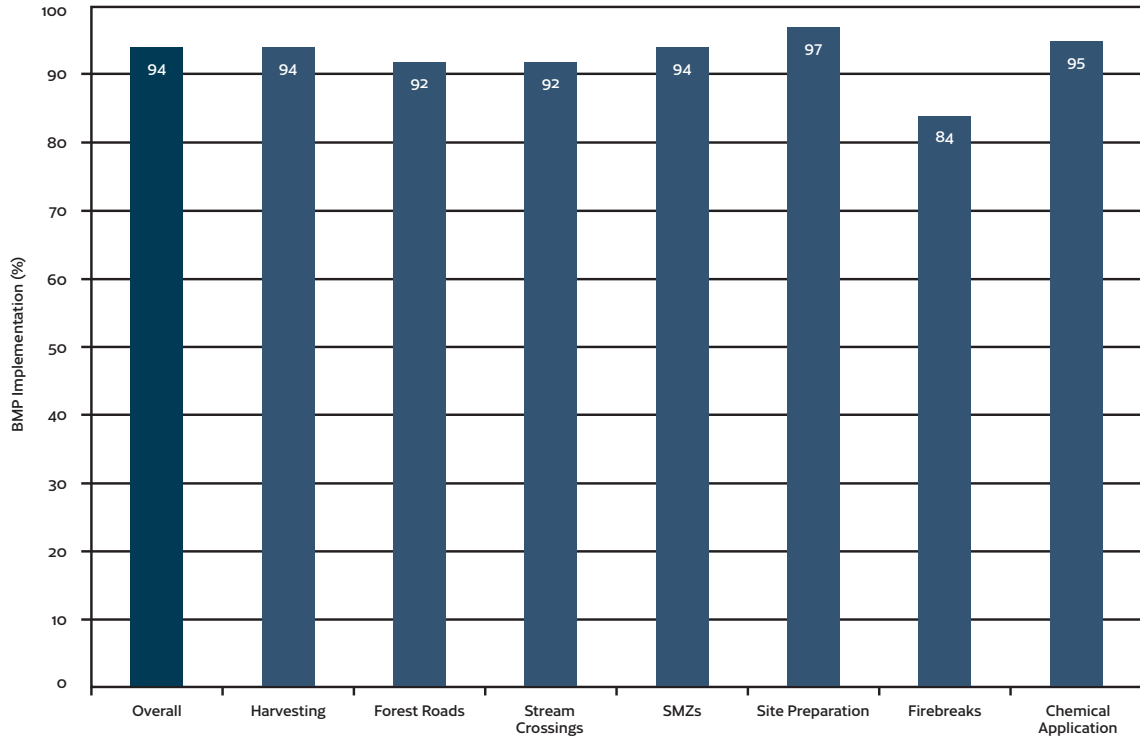
Regional Averages

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 were then compared to the region-wide averages of the 2012 and 2008 reports to identify any change. The current overall BMP implementation average for the southern region is 93.6 percent, representing an increase of over six percentage points since the initial Survey (2008). Regional BMP implementation averages increased since the last report for all categories except Harvesting and Chemical Application. Notable improvement was observed in the Stream Crossings and Forest Roads categories, with both categories gaining five percentage points since 2012. Figure 2 below illustrates the average regional BMP implementation by category for three published regional reports (2008, 2012, 2018).

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 range of responses since the last report.

Figure 2. Comparison of Average Regional BMP Implementation by Category (08-18)
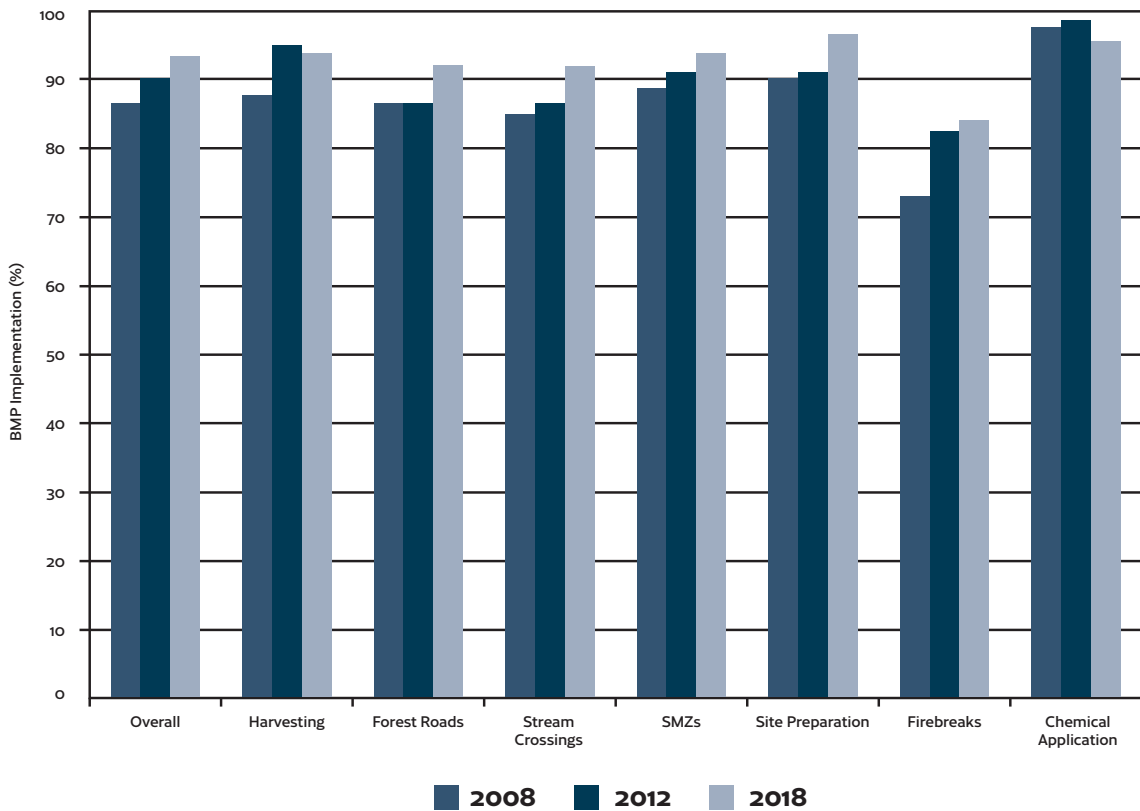
Harvesting

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 82.0 to 99.9 percent, with a regional average of 94.0 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. Twelve states captured Forest Road BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 85.0 to 99.8 percent with a regional average of 92.0 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. Twelve states captured Stream Crossing BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 78.8 to 100 percent with a regional average of 91.7 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. Twelve states captured SMZ BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 85.5 to 98.9 percent with a regional average of 93.9 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. Eleven states captured Site Preparation BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 92.6 to 99.2 percent with a regional average of 96.6 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 ten 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 33.0 to 100 percent with a regional average of 84.4 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 fertilizer, especially in close proximity to water resource features. Ten states captured Chemical Application BMPs directly and responded with data for this category. For this reporting period, implementation ranged from 63.0 to 100 percent with a regional average of 95.4 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 third in a planned series to be published every five to seven 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.

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 with room for improvement, an overall regional implementation rate of 93.6 percent is considered exceptional. 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.

*Great Smoky Mountains,
Tennessee*

*Implementation of Forestry Best Management Practices: **2018 Southern Region Report***

Figure 3. Changes in Overall BMP Implementation by State
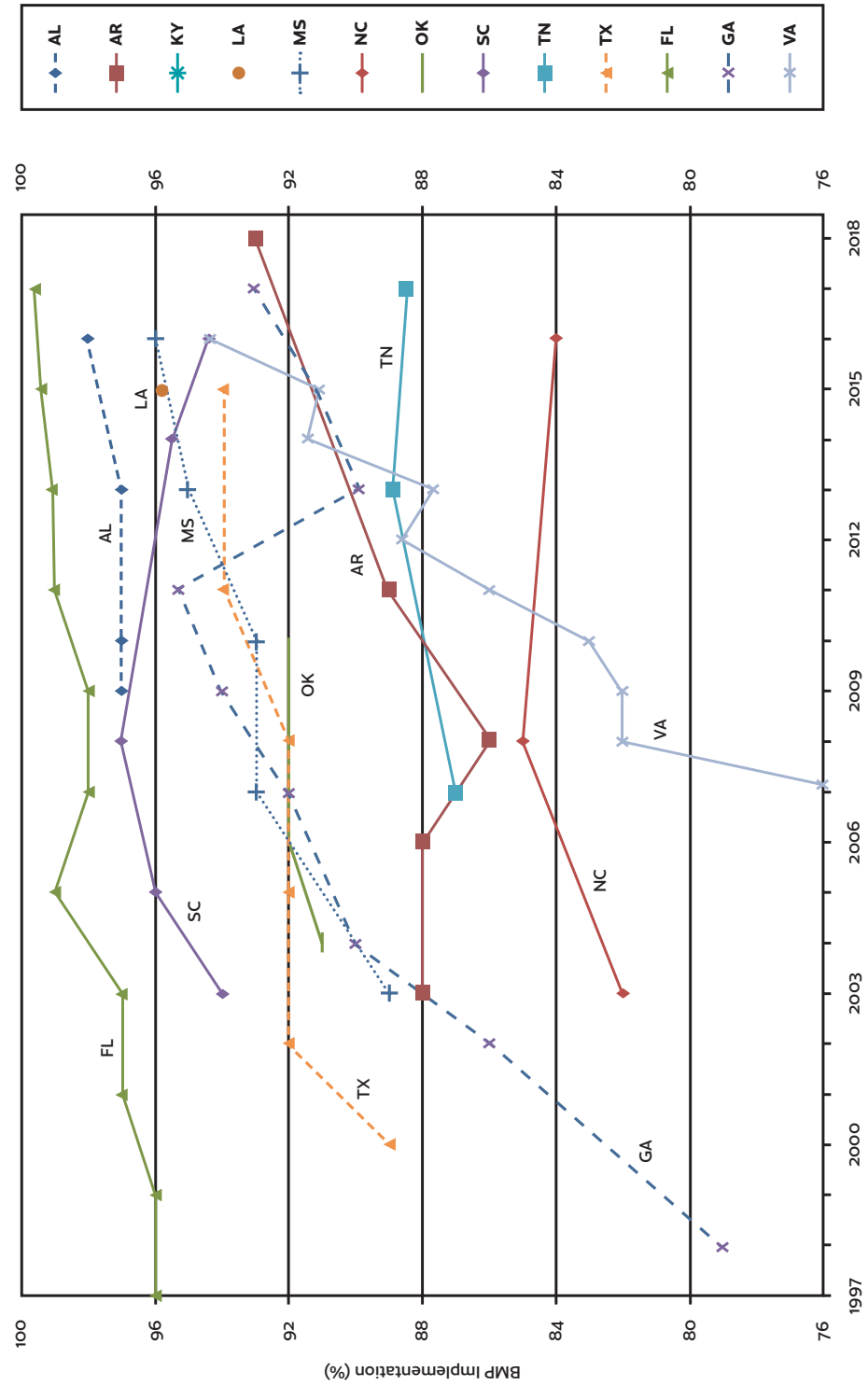
Table 1. BMP Implementation by State, Year, and Regional Category

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
2013	97	97	93	93	98	96	96	100
2016	98	97	95	97	96	97	95	95
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
2018	93	95	93	95	89	97	89	98
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
2013	99	99	98	99	98	99	100	100
2015	99	99	99	99	99	99	100	100
2017	99	99	99	100	99	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
2013	90	97	86	86	86	95	92	100
2015	91	97	86	84	94	94	94	100
2017	93	97	91	88	93	95	90	100
Louisiana								
2015	89	98	84	67	86	96	96	100

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
2013	95	-	95	96	93	97	94	-
2016	96	-	96	97	96	97	93	-

North Carolina							
2003	82	76	80	64	87	N/A	N/A	99
2008	85	85	86	72	91	N/A	N/A	94
2016	84	82	85	83	87	97	84	63

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	-	-	-
2008	97	96	95	94	99	-	-	-
2014	95	96	95	84	96	-	-	-
2016	94	-	-	-	-	93	81	100

Tennessee							
2009	87	93	91	80	85	90	-	-
2013	89	87	88	82	88	97	87	-
2017	88	89	86	79	85	-	-	-

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	98	95	85	90	98	89	98
2015	94	93	92	92	98	93	82	100

Virginia							
2007	75	78	70	77	82	60	-	-
2009	8	79	79	81	81	-	68	100
2009	82	82	75	83	86	80	70	88
2010	83	85	74	82	86	81	74	-
2011	86	86	78	87	91	81	76	-
2013	89	90	83	92	90	-	84	100
2014	88	89	84	90	89	83	76	100
2015	91	93	87	95	92	100	87	100
2016	91	91	88	95	93	100	77	100
2017	94	92	88	95	93	100	-	100

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.

Southern Group of State Foresters (SGSF). 2008. *Implementation of Forestry Best Management Practices: A Southern Region Report.* Southern Group of State Foresters, Water Resources Committee. Available online at: http://www.southernforests.org/resources/publications/Regional%2 BMP%20Report%202008.pdf/view

Southern Group of State Foresters (SGSF). 2012. *Implementation of Forestry Best Management Practices: 2012 Southern Region Report.* Southern Group of State Foresters, Water Resources Committee. Available online at: http://www.southernforests.org/water/SGSF%20BMP%20Report%202012.pdf

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	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/ForestManagement/documents/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.state.ms.us/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	tfsweb.tamu.edu/Water_Publications
Virginia	2011	www.dof.virginia.gov/wq/resources/ManualBMP/2011_Manual_BMP.pdf

*DuPont State Forest,
North Carolina*

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
Arkansas	www.agriculture.arkansas.gov/best-management-practices-water-quality
Florida	www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Best-Management-Practices-BMPS
Georgia	www.gfc.state.ga.us
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-forestry-best-management-practices
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/infopubs/index.htm#WaterQuality