

GEORGIA FORESTRY
COMMISSION



Results of Georgia's 2007 Silvicultural Best Management Practices Implementation and Compliance Survey



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Implementation and Compliance Survey**

**Prepared by the
Georgia Forestry Commission**

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EXECUTIVE SUMMARY

By designation from the Georgia Environmental Protection Division (GAEPD), the Georgia Forestry Commission (GFC) is the lead agency for statewide development, education, implementation, and monitoring of forestry Best Management Practices (BMPs). Beginning February of 2007, the GFC began the sixth statewide forestry BMP Implementation and Compliance Survey.

The objectives of the 2007 Statewide Forestry BMP Survey were to determine the: rates of BMP implementation; acres in BMP compliance; effectiveness of BMPs for any needed modifications; actual miles of streams that may have forestry water quality impairments; and ownerships and regions to target for future training.

The protocol and scoring methodology for this sixth survey was consistent with the Southern Group of State Foresters (SGSF) BMP Monitoring Task Force revised recommendations developed and adopted in June 2002 titled *Silvicultural Best Management Practices Implementation Monitoring, a Framework for State Forestry Agencies*. The SGSF Task Force is composed of hydrologist and water specialists from state forestry agencies, US Forest Service, forest industry, and the National Council of the Paper Industry for Air and Stream Improvement (NCASI) in consultation with EPA Region IV nonpoint source specialists.

The 2007 Statewide Forestry BMP Survey evaluated 370 sites that were selected in a stratified random sample. These sites had to have been silviculturally treated within the past 2 years, preferably within the past 6 months. By ownership, 282 sites occurred on the non-industrial private forest landowner (NIPF), 75 sites on forest industry land, 5 sites on Corporate (TIMO) land, and 8 sites on public land. By Region, 25 sites were in the Mountains, 114 sites in the Piedmont, 80 sites in the Upper Coastal Plain, and 151 sites in the Lower Coastal Plain.

BMP Implementation was determined by dividing the total number of individual BMPs that were applicable and fully implemented on the sites by the total number of applicable BMPs and summarized for each practice or category, overall site, region, and statewide. **Of the 9,605 individual BMPs evaluated, the statewide percentage of correct implementation was 91.8%. This is a 2.2% increase from the 2004 survey.** By ownership, the percentage of BMP implementation statewide was 96.0% on forest industry lands, 94.8 on Corporate (TIMO) lands, 88.1% on Public lands, and 90.6% on NIPF lands.

BMP Compliance was determined by dividing the units of measure specific to the forest practice (# acres, # stream crossings, # miles of road) that were in compliance with BMPs by the total number of units measured for that particular practice. Because multiple operations occurred over the same acres on numerous sites, acreage figures were duplicated. Therefore, of the 30,156 acres contained on the 370 sites, approximately 36,878 acres of separate forest operations were evaluated. Approximately 99.7% of those acres were in compliance with BMPs. **This rate is 0.26 percent higher than the 2004 survey.** Of the 129.0 miles of stream evaluated, 118.89 miles, or 92.2%, were observed to have no impacts or impairment from the forestry practices. **This represents a slight decrease of 3.9% from the 2004 survey.**

By practice or category, statewide percentage of BMP Implementation and Compliance were as follows:

Practice or Category:	% BMP Implementation	% BMP Compliance
Streamside Management Zones (SMZs):	89.2	94.2 (acres)
Stream Crossings:	84.3	44.0 (# crossings)
Main Haul Roads:	91.3	92.1 (miles)
Timber Harvesting:	97.4	99.8 (acres)
Mechanical Site Preparation:	94.3	99.9 (acres)
Chemical Site Preparation:	97.9	100 (acres)
Firebreak Construction:	67.5	78.9 (miles)
Control Burning:	95.7	99.9 (acres)
Artificial Regeneration:	100	100 (acres)
Equipment Servicing:	98.6	98.7 (# landings)
Special Management Areas:	91.6	
Stream Miles:		92.0 (miles)
Overall:	91.75	99.7 (acres)

With public attention focusing on water and the protection of riparian areas or streamside management zones, there should be much interest in the fact that the forestry community's BMP Implementation rate for streamside management zones (SMZ's) is 89.2%, with 94.2% of SMZ acres in full compliance with BMPs. Forest operators are doing an excellent job of protecting these sensitive areas. In addition, with basically a 92% overall statewide BMP Implementation rate, and with 99.7% of those acres in compliance with BMPs, as a whole, forest operators appear to be doing a very good job of implementation of forestry BMPs.

However, there is room for improvement in certain categories. As with the previous survey, the stream crossings category is an area where improvement is needed. There were 268 stream crossings evaluated on 124 sites with an overall compliance of 44.0%, a number very similar to the last survey's crossing compliance. This means that 55.9% of stream crossings evaluated had some BMP deficiencies, which in many cases were minor deficiencies. The overall stream crossing BMP implementation did increase slightly. The overall stream crossing BMP implementation score increased 4.6% to 84.35%, meaning that more stream crossing BMPs were fully applied or implemented, and that of the stream crossings that did have BMP deficiencies, there were actually slightly fewer deficiencies. In addition, the number of stream crossings evaluated per site went down by 15.3%, indicating that fewer crossings are being attempted per forestry activity.

Most noted stream crossing problems were that of the 268 total crossings, 105 or 39% were associated with skidder fords or debris type crossings. These automatically count as non-compliant since the BMPs do not recommend their use. Just eliminating these type crossings offers the greatest potential to increase compliance.

Landowners having potential water quality problems were advised by letter with recommendations for remediation.

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INTRODUCTION

Georgia has an abundant amount of forest and water resources that provide a variety of benefits for the people of the state and region. The 23.6 million acres of commercial forestland (2/3rds of the state) provide for forest products, clean water, clean air, soil conservation, wildlife habitat, recreation, aesthetics, education, and research. Many of the state's 44,056 miles of perennial streams, 23,906 miles of intermittent streams and 603 miles of ditches and canals begin or flow through forestlands. Therefore, it is important for forest landowners to practice responsible forestry in order to protect these water resources

As a result of the 1972 Federal Clean Water Act, the Georgia Environmental Protection Division (GAEPD) has been responsible for managing and protecting the states waters from point and nonpoint sources of pollution. Since 1977, the GAEPD has designated the Georgia Forestry Commission (GFC) as the lead agency to develop, educate, implement, and monitor the use of Best Management Practices (BMPs) for Forestry operations to minimize or prevent our nonpoint source pollution (primarily erosion and sedimentation) contributions. Upon passage of the Clean Water Act (CWA) Amendments of 1987, the EPA issued guidance on the relationship of nonpoint source controls and water quality standards as part of the Water Quality Standards Handbook. The guidance states: ***"It is recognized that Best Management Practices, designed in accordance with a state approved process, are the primary mechanism to enable the achievement of water quality standards."*** It goes on to state: ***"It is intended that proper installation of state approved BMPs will achieve water quality standards and will normally constitute compliance with the CWA."***

BMPs for Forestry were first developed in 1981. A Wetlands BMP manual was developed in 1990 and revised in 1993. In January 1999, these manuals were revised and combined into one document with input from environmental groups, soil and water experts, fish and wildlife biologists, attorneys, private forest landowners, independent timber buyers and loggers, academia, state and federal water quality personnel. Since then, guidance on treatment of canals and ditches was adopted in March 2000 and for floodplain features in riverine systems in July 2003. Since 1981 over 88,017 BMP manuals and brochures have been given out.

The main role of the GFC is to educate and inform the forestry community of these common sense recommendations known as BMPs through workshops and field demonstrations. Since publication of the first BMP manual, the GFC has provided 2,278 BMP talks to over 75,597 persons and participated in 394 field demonstrations of BMPs through December 2007. The education process is on going, with workshops routinely provided for foresters, timber buyers and loggers through the Sustainable Forestry Initiative (SFI) Program in Georgia. GFC foresters have also provided BMP advice on over 75,000 cases covering almost 5 million acres.

Implementation of BMPs is determined through monitoring surveys and during the complaint resolution procedures. Of statistical importance are the monitoring surveys. The GFC conducted BMP Implementation and Compliance Surveys in 1991, 1992, 1998, 2002, and 2004. The statewide percentage of acres in compliance averaged 86% in 1991, 92% in 1992, 98% in 1998, 99.1% in 2002, and 99.4% in 2004.

The purpose of this report is to present the results of the 2007 BMP Implementation and Compliance Survey.

SURVEY PROCEDURE

Methodology for Sampling Intensity and Site Selection

The number of sites to evaluate in each of Georgia’s 159 counties was based on the amount of timber harvested in each county as determined using the US Forest Service’s, “Forest Statistics for Georgia, 1997” report, Table 35 - Average Annual Removals of Growing Stock on Timberland by County and Species Group. The following criteria were used:

Thousand Cords	Thousand Cubic Feet	Target Sites
< 50	< 3,715	1
50 – 100	3,716 – 7,430	2
101 – 200	7,431 – 14,860	3
201 – 300	14,861 – 22,290	4
>301	> 22,291	5

This method resulted in approximately 377 sites being targeted to survey. The next step was to target the sample to reflect ownerships where the practices occurred. This was determined also using the US Forest Service’s, “Forest Statistics for Georgia, 1997” report, Table 47 - Area of Timberland Treated or Disturbed Annually and Retained in Timberland by Treatment or Disturbance and Ownership Class. The ownership classes are categorized into non-industrial private forest (NIPF) land, forest industry (FI), and Public lands, which includes federal, state, county or city ownership. Of the total annual acres silviculturally treated by county, the percentage for each ownership category was determined and multiplied by the number of sites to sample in each county. Of the 377 sites targeted, 274 sites (72.7%) would be on NIPF, 90 sites (23.9%) would be on FI, and 13 sites (3.4%) would be on Public lands resulting in a stratified sample. Seven sites in metropolitan counties were not available to survey since they were converted to development use.

In order to randomize the stratified sample, GFC personnel went to the county tax assessor’s office and used the Georgia Department of Revenue’s PT 283-T “Report of Timber Harvest” notification forms on record. Only landowner information from “lump sum” sales or “owner harvests” during the past 2 years and preferably during the last 6 months was used to compile a list of potential random selection sites. The forms were separated by ownership category and the appropriate number of sites was drawn randomly. Information from “unit sales” is confidential and therefore unavailable for target sites. Figure 1, page 48, shows the distribution of survey sites by county.

Site Evaluation

The protocol and scoring methodology was consistent with the Southern Group of State Foresters Protocol titled *Silvicultural Best Management Practices Implementation Monitoring, a Framework for State Forestry Agencies* for this fifth survey as noted in the Executive Summary.

After being selected and verified in the field by County Foresters or Chief Rangers that the practice had indeed taken place, attempts to contact all landowners were made to obtain permission prior to the site being evaluated. All evaluations were conducted by trained District Water Quality Foresters to provide accuracy, consistency, and quality control using the BMP Compliance Survey Form, pages 50-62.

Once selected, the district water quality forester completed the survey form. Each site was identified by county, district, physiographic region, ownership, river basin and sub-basin, forest types before treatment, terrain class, soil erodibility class, hydric soil limitation class, type water bodies within the practice area, and miles of stream evaluated within the practice area. Soils and stream data was determined using NRCS county soil survey maps where available or USGS Topographical maps. Data could be extracted by each of these fields of information.

BMP Implementation

Each site was then evaluated for BMP implementation by observing as much of the treated area as possible and answering the 136 specific, YES / NO answer type questions directly related to BMP implementation. Scoring occurred at three levels on each site: (1) individual BMP; (2) category of practice; and (3) overall site implementation.

For a level 1, individual BMP, implementation was recorded as either a *NOT APPLICABLE*, *YES*, or *NO*. For simplification, each question was worded so that a positive answer was recorded as a “*YES*” while a negative answer, indicating a significant departure from BMP recommendations, was answered with a “*NO*”. If an individual BMP, that was applicable and needed, was not fully implemented over the entire area, it received a *NO*. The “all or none principle” as recommended by the SGSF framework applied.

For level 2, categories of practice, and level 3, overall site implementation, the score was expressed as a percent of all applicable BMPs implemented against all applicable BMPs in the category of practice and overall site. Therefore, each category of practice and overall site could score between 0% and 100%. The categories of practices evaluated were as follows:

- Streamside Management Zones (SMZs)
- Stream Crossings
- Main Haul Roads
- Timber Harvesting outside SMZs
- Mechanical Site Preparation outside SMZs
- Chemical Site Preparation outside SMZs
- Firebreak Construction
- Control Burning outside SMZs
- Artificial Regeneration outside SMZs
- Forest Fertilization outside SMZs
- Equipment Servicing outside SMZs
- Special Management Areas
- Stream Miles

Water Quality Risk

In addition, each BMP was further evaluated in terms of “water quality risk”. A risk is defined as “a situation or set of conditions that has resulted, or may result, in erosion or other pollutants entering a water body, an increase in stream temperature, or the physical degradation or obstruction of water bodies observed at each BMP question. Documenting the occurrence of risks serves a number of useful and practical purposes. First, risk assessment lends much credibility and integrity to the BMP monitoring process by evaluating the effectiveness of an individual or group of BMPs and allows opportunities to analyze ineffective BMPs for

possible revisions. Second, by recognizing that high-risk conditions can occur and that prevention and or restoration is a high priority for state forestry agencies. Third, routine documentation of risks will determine whether such instances are the exception rather than the rule and the lack of BMPs during a silvicultural operation may not necessarily equate to or result in a water quality standards violation. Fourth, finally providing forest landowners with an objective risk assessment is a valuable public service that not only protects the environment, but can also protect the landowner and/or operator from what might otherwise result in enforcement proceedings or other personal liability.

BMP Compliance

BMP Compliance was also determined for each category of practice and overall site where the units of measure were the same. This allowed for comparison with previous surveys in determining trends. Streamside Management Zones (SMZs), harvesting, mechanical site preparation, chemical applications, control burning, and artificial regeneration all used *acres* as the unit of measure. Stream crossing was the *actual number* present. Main haul roads, firebreaks, and streams used *miles*. Scores were expressed as a percent of units of measure in BMP compliance against the total units of measure evaluated. Documenting compliance with the units of measure is important in that it allows forest managers, landowners, and regulators to see the holistic picture of forestry operations and our effects on the landscape. As in the implementation evaluation, the lack of BMP implementation may not necessarily equate to large-scale areas being out of compliance. For those areas out of compliance it provides a better picture of where attention should be focused to make improvements.

RESULTS AND DISCUSSION

The 2007 Statewide Forestry BMP Survey evaluated 370 sites comprising 30,156 acres. Because multiple practices occurred on these same areas, approximately 36,878 acres, 268 stream crossings, 252.8 miles of main haul roads, and 129.0 stream miles were evaluated. Figure 2, page 49, is a map of the State showing the different physiographic regions for reference. Figure 1, page 48 shows the distribution of sites by county. The Statewide BMP Compliance Survey Report in the Appendix provides a summary of the distribution of the sites evaluated by region, ownership, specific questions regarding timber sales on NIPF lands, and specific site information and the BMP implementation and compliance results for each practice and BMP evaluated.

By practice or category, the statewide percentage of BMP Implementation and Compliance are as follows and will be explained in further detail in the following sections.

Practice or Category:	% BMP Implementation	% BMP Compliance
Streamside Management Zones (SMZs):	89.2	94.2 (acres)
Stream Crossings:	84.3	44.0 (# crossings)
Main Haul Roads:	91.3	92.1 (miles)
Timber Harvesting:	97.4	99.8 (acres)
Mechanical Site Preparation:	94.3	99.9 (acres)
Chemical Site Preparation:	97.9	100 (acres)
Firebreak Construction:	67.5	78.9 (miles)
Control Burning:	95.7	99.9 (acres)
Artificial Regeneration:	100	100 (acres)

Equipment Servicing:	98.6	98.7 (# landings)
Special Management Areas:	91.6	
Stream Miles:		92.2 (miles)
Overall:	91.75	99.7 (acres)

Of the 129.0 miles of stream evaluated on 51 sites, 118.9 miles or 92.2% were observed to have no impacts or impairment from the forestry practices. The total number of water quality risks checked was 154.

Statistical Analysis

The 370 sites evaluated during this survey represent only a sample of all operations that met the criteria for selection. Data compiled from county tax assessor’s offices indicate that the number of timber harvesting operations conducted annually range from 7,000 to 10,000. Therefore one could assume the sample reflects a 4.1% or 5.9% sample at best. Having enough samples to pass a statistical analysis with some degree of confidence is a concern. Therefore, the SGSF appointed a sub-task force composed of Dr. Ron McNew, Professor, University of Arkansas; John Greis, USFS; and Hughes Simpson, Texas BMP Coordinator to develop the *Statistical Guidebook for BMP Implementation Monitoring*.

The guidebook should be used to determine the number of sites needed to conduct a statistically reliable survey, to calculate the margin of error for each BMP category or individual BMP, and analyze statistical trends in implementation.

Formula for Determining the Sample Size, or Number of Sites to Evaluate

$$n = \frac{4p(100 - p)}{m^2}$$

Where n = the number of sites to evaluate
 p = the estimated overall percent implementation in the state
 m = the margin of error (5%)

- Notes:
- p must be estimated because it is unknown (% implementation from the most recent survey may be used)
 - the closer the estimated value of p is to 100, the lower the value of n will be.
 - n is highest when p is estimated to be 50%.
 - m is the margin of error associated with the estimate of p. That is, there is 0.95 probability that the sample taken will produce an estimate which differs from p by a value of m. A margin of error at 5% was recommended by the SGSF framework.

Using the above formula and the overall statewide BMP implementation rate of 89.8% from the 2004 survey results for p and margin of error at 5 the formula would be:

$$n = \frac{4(89.8) * (100 - 89.8)}{5^2} = \frac{359.2 * 10.2}{25} = \frac{3,663.84}{25} = 147 \text{ sites}$$

This equation calculates the minimum number of sites necessary to evaluate. Increasing the sample size will yield an even more accurate estimate of BMP implementation. Therefore the 370 sites evaluated are more than twice what was necessary.

Standard Error (se):
$$se = \sqrt{\frac{p(1-p)}{n}}$$

Where p = estimate of statewide BMP implementation (91.8)
 n = total applicable BMPs evaluated (9,605)

$$se = \frac{\sqrt{.918(1 - .918)}}{9,605} = \frac{\sqrt{0.918(.082)}}{9,605} = \frac{\sqrt{.073636}}{9,605}$$

$$se = \sqrt{.0000076} = .0028$$

95% Confidence Interval (ci)

The 95% confidence interval is a tool that statisticians use to demonstrate their confidence in the measured mean of a sample. It provides a range for which they are 95% confident that the actual mean will be found within that range. To calculate confidence interval, the mean, variance, standard deviation, standard error, and margin of error must also be calculated.

$$Ci = p \pm 2 se$$

$$= .918 \pm 2(.0028) = .918 \pm .005 = .913, .923$$

For the 2007 survey, the overall estimate of statewide BMP implementation (p) is 91.8% with an estimated standard error of .0028. Using the 95% confidence interval (ci), the data indicates that 95% of the time it is reasonable to expect implementation with BMPs to be at least 91.3% but no more than 92.3%.

**OVERALL BMP IMPLEMENTATION AND COMPLIANCE RESULTS
 BY CATEGORY OF PRACTICE**

STREAMSIDE MANAGEMENT ZONES (SMZs)

Streamside Management Zones (SMZs) are designated areas of varying widths adjacent to the banks of perennial (continuous flowing) or intermittent (normally flows only during winter months) streams and other bodies of water. USGS topographical maps and Natural Resource Conservation Service county soil survey maps were used to identify these type streams. In these zones, forest management practices are modified in order to minimize potential impacts so as to protect water quality, fish, or other aquatic resources. According to

the 1999 BMP manual, zones along intermittent streams vary in width from 20 feet to 50 feet on most streams, depending on slope, and 100 feet along trout streams. Zones along perennial streams vary from 40 feet to 100 feet, depending on slope. Clear cutting is not recommended in the SMZs except for control of Southern pine beetle or salvage operations from natural disasters.

Table 1, page 30, provides a summary of the results by ownership, region and state total. Statewide, approximately 1,161 acres within the SMZ were evaluated on 210 sites. Approximately 1,094 acres or 94.2% were in compliance with BMPs. A total of 1,852 applicable BMPs were evaluated of which 1,652 or 89.2% were fully implemented. A total of 30 water quality risks (WQRs) were identified when BMPs were not implemented. Specific findings include:

- Appropriate SMZs widths were established on 83.2% of the sites. 1 WQR was identified.
- The recommended tree canopy was maintained on 86.9% of the SMZs. 2 WQRs were identified.
- As recommended, stream bank trees were left un-harvested w/in SMZs on 86.3% of the sites. 1 WQRs were identified.
- Soil disturbance by harvesting equipment w/in SMZs was minimized on 94.7% of the sites. 1 WQR was identified.
- Treetops, limbs, and logging debris were kept out of stream channels on 83.7% of the sites. 1 WQR was identified.
- New forest roads were located outside the SMZ on 100% of the sites. Where roads did occur within SMZs, they were stabilized on 80.9% of the sites. 2 WQRs were identified.
- Water control structures directed surface flow away from stream and water bodies on 76.9% of sites. 8 WQRs were identified.
- Skid trails, log decks, and staging areas were located outside SMZs on 94.6% of sites. 4 WQRs were identified.
- Mechanical site preparation was kept out of SMZs on 88.9% of 34 sites.
- The handling, mixing, loading and application of chemicals kept out of SMZs on 16 (84.2%) of 19 sites.
- Pre-suppression firebreaks were installed outside the SMZ on 81.0% of sites. 0 WQRs were identified. Breaks tied into streams had adequate diversions installed at SMZ margins on 27.3% of sites. 4 WQRs were identified. Where prescribed fire occurred within SMZs, the intensity of the fire was minimized on 90.9% of the sites with 1 WQR identified.
- Machine tree planting was kept outside SMZs on 83.3% of sites, with 1 WQR identified.
- Equipment was properly serviced on 100% of 346 sites.

SMZs BY REGION

In the mountain region, approximately 101.1 SMZ acres were evaluated on 13 sites. The percentage of acres in BMP Compliance was 80.6%. A total of 114 individual BMPs were evaluated of which 80.7% were fully implemented. There was 1 water quality risk identified.

In the Piedmont, approximately 437.2 SMZ acres were evaluated on 77 sites. The percentage of acres in BMP Compliance was 98.2%. A total of 676 individual BMPs were evaluated of which 91.0% were fully implemented. There were 10 water quality risks identified.

In the Upper Coastal Plain, approximately 209.4 SMZ acres were evaluated on 41 sites. The percentage of acres in BMP Compliance was 97.1%. A total of 382 individual BMPs were evaluated of which 90.6% were fully implemented. There were 14 water quality risks identified.

In the Lower Coastal Plain, approximately 413.1 SMZ acres were evaluated on 79 sites. The percentage of acres in BMP Compliance was 91.8%. A total of 680 individual BMPs were evaluated of which 88.1% were fully implemented. There were 5 water quality risks identified.

SMZs by OWNERSHIP

For NIPF ownership, approximately 713.0 acres were evaluated on 158 sites. Overall, the percentage of acres in BMP Compliance was 92.2% and ranged from a low of 56.1% in the mountains to a high of 97.8% in the Piedmont. Overall BMP Implementation was 87.7% and ranged from a low of 79.6% in the mountains to a high of 90.3% in the Upper Coastal Plain. There were a total of 28 water quality risks with the most (12) occurring in the Upper Coastal Plain. The main problems and challenges associated with SMZs on NIPF lands involve water control structures in roads within SMZs, where only 68.9% of these roads have these structures correctly installed. Stabilization of roads located within SMZs, are a problem as only 77.1 % of those roads are stabilized. Logging debris (tops and limbs) was left in stream channels on 19.7% of the sites. Firebreaks were installed outside SMZs on 79% of sites, but on sites with firebreaks located within the SMZs, only 30.0% had adequate water control structures in place at SMZ boundary.

On forest industry lands (FI), approximately 373.6 acres of SMZs were evaluated on 44 sites. Overall, the percentage of acres in BMP Compliance was 97.3% and ranged from a low of 78.1% in the Mountains, to a high of 99.9% in the Lower Coastal Plain. Overall BMP Implementation was 96.3% and ranged from a low of 90.0%% in the mountains to a high of 98.0% in the Lower Coastal Plain. There was a total of 2 water quality risks identified. All BMPs were implemented in the 90-percentile range.

On corporate (TIMO) lands, approximately 28.1 acres of SMZs were evaluated on 3 sites, all in the Lower Coastal Plain. BMP compliance for these sites was 99.8%. There were 26 total BMP's assessed, with BMP implementation of 84.6%.

On Public lands, approximately 46.0 acres of SMZs were evaluated on 5 sites. Overall, the percentage of acres in BMP Compliance was 97.1% and ranged from a low of 0% in the Lower Coastal Plain to a high of 99.8% in the Piedmont. Overall BMP Implementation on Public lands for SMZs was 78.6% and ranged from a low of 50.0% in the Lower Coastal Plain to a high of 94.4% in the Piedmont. There were no water quality risks identified in any of the regions. The main problems identified were a site preparation burn occurring in an SMZ on one site and logging debris in stream channels occurring on one site. Also, streambank trees were harvested on one site and one site had skid trails and/or log decks occurring within SMZs.

STREAM CROSSINGS

Stream crossings are often necessary for access to forestlands. From a water quality standpoint, stream crossings are the most critical aspect of the road system. Failure of a stream crossing, due to improper planning or construction, can result in erosion and introduction of sediment into a stream, which can affect water quality. Types of acceptable crossings include main haul road fords, culverts, or bridges. Debris and dirt type crossings

or skidder fords are not acceptable crossing types. Permanent crossings were considered to be those still in place at the time of inspection. Temporary crossings were noted where crossing approaches were still evident, but the actual crossing facility (i.e. temporary bridge, culvert and fill, etc.) had been removed.

Table 2, page 31, provides a summary of the results by ownership, region and state total. A total of 268 crossings were evaluated on 124 sites statewide. According to the survey, 19 main haul road fords, 84 permanent culverts, 32 temporary culverts, 28 bridges, 49 skidder fords, and 56 debris and dirt type crossings were observed. Multiple numbers and types of crossings occurred on many sites.

Of the 268 total crossings, 108 existed prior to the forestry practice being conducted and 66% of those were in compliance. There were 160 new crossings associated with the forest practices that were evaluated, of which, 32.5% were in compliance. Overall stream crossing compliance was 44.0%.

The biggest concern, and the potential area for the greatest improvement, is eliminating the skidder fords and debris and dirt type crossings. Together they make up 39% of the total non-compliance. New permanent culvert installation compliance was 63.6%.

A total of 1,533 individual stream crossing BMPs was evaluated, of which 84.3% were fully implemented. A total of 80 water quality risks were identified.

Other significant findings and areas for improvement include:

- Crossings were minimized on 91.8% of the sites. Four WQRs were identified
- Approaches to stream crossings were within acceptable road grades on 96.5% of the sites. One WQR was identified
- Of the 73 pre-existing permanent culverts, 61.6% were in compliance.
- Of the 11 new permanent culverts, 63.6% were in compliance. Of the 31 new temporary culverts, 90.3% were in compliance.
- Culverts on 72.0% of the sites were of the recommended size diameter for the watershed. Eight WQRs were identified where they were not adequately sized.
- Fill over culvert ends met a 2:1 slope, or was armored, only on 75.9% of the sites. Four WQRs were identified.
- Exposed soils in wetland fill roads and at stream crossings were stabilized on 75.9% of the sites. Four WQRs were identified.
- Fords for skidder crossings occurred at 49 different places on 31 sites. Fifteen WQRs were identified.
- Debris and dirt type crossings occurred at 56 different places.
- Temporary crossings were removed and approaches stabilized as recommended on 51.4% of the sites. Nine WQRs were identified.
- Of the total water quality risks identified statewide over all practices, 80 or 52% were attributed to stream crossings.

Stream Crossings by Region

In the mountains, 18 crossings were evaluated on 9 sites. Overall the percentage of crossings in BMP Compliance was 66.7% and BMP implementation was 94.2%. There were 2 water quality risks identified.

In the Piedmont, 67 crossings were evaluated on 39 sites. Overall the percentage of crossings in BMP Compliance was 23.9% and BMP Implementation was 76.9%. There were 54 water quality risks identified.

In the Upper Coastal Plain, 36 crossings were evaluated on 17 sites. Overall the percentage of crossings in BMP Compliance was 41.7% and BMP Implementation was 78.0%. There were 9 water quality risks identified.

In the Lower Coastal Plain, 147 crossings were evaluated on 59 sites. Overall the percentage of crossings in BMP Compliance was 51.0% and BMP Implementation was 88.9%. There were 15 water quality risks identified.

Stream Crossings by Ownership

On NIPF, 184 crossings were evaluated on 89 sites. Overall the percentage of crossings in BMP Compliance was 32.6% and ranged from a low of 18.3% in the Piedmont, to a high of 50.0% in the mountains. Overall BMP implementation was 80.9% and ranged from a low of 73.9% in the Piedmont, to a high of 92.2% in the mountains. There were 73 water quality risks identified with the majority (51) occurring in the Piedmont. The main problems identified were that a total of 48 skidder fords and 40 debris and dirt type crossings made up 48% of the 184 total crossings on NIPF lands. These are automatic non-compliant. In fact 84% of these type crossings occurring statewide across all ownerships were found on the NIPF lands. Other problems were similar to those found statewide.

On forest industry lands, 82 crossings were evaluated on 34 sites. Overall the percentage of crossings in BMP Compliance was 70.7% and ranged from a low of 50.0% in the Upper Coastal Plain to a high of 87.5% in the Mountains. Overall BMP Implementation was 93.4% and ranged from a low of 85.7% in the Upper Coastal Plain to a high of 97.7% in the Mountains. There were 7 water quality risks identified. Again the biggest problem involved skidder fords and debris crossings as they made up almost 18% of the non-compliance.

On Public lands, 2 crossings were evaluated on 1 site occurring in the Upper Coastal Plain. Neither of these crossings was in compliance with the BMPs for crossings, resulting in 0% compliance for stream crossings in the Public ownership class. One of the crossings was a skidder ford, the other a debris and dirt type crossing, both automatically out of compliance.

No crossings were observed on the Corporate (TIMO) ownership class.

FOREST ROADS

Permanent or temporary access roads are an essential part of any forest management operation and provide access for other activities. With proper planning, location, construction, and maintenance, access roads allow for productive operations and cause minimal soil and water quality impacts. However, poorly located, poorly constructed, or poorly maintained roads can result in sediment reaching streams that may result in changing stream flow patterns, degrading fish and aquatic organism habitat, and adversely affecting aesthetics.

Table 3, page 32, provides a summary of the results by region, ownership and state totals. Approximately 253 miles of road were evaluated on 336 sites. The number of miles in BMP Compliance was 92.1%. A total of

2,355 individual BMPs were evaluated and the percentage of BMP Implementation was 91.3%. There were 21 water quality risks identified.

Significant findings include the following:

- Construction of new roads was kept within allowable grades on 97.0% of the sites. Only 2 water quality risks were identified for this BMP.
- Roads were located on the sides of ridges to allow for proper drainage on 96.0% of sites. No water quality risks were associated with this BMP.
- Roads were well drained by the use of adequately installed and spaced water diversion measures on 73.0% of sites. There were 3 water quality risks identified.
- Water diversion measures with turnouts were installed prior to SMZs only on 69.2% of sites leading to 9 water quality risks.
- Rutting of roads was avoided on 96.8% of sites.
- Roads were reshaped and adequately stabilized on 83.0% of sites. Five water quality risks were identified.
- Mud and debris was kept off public roads at tract entrances on 98.5% of sites.

Roads by Region

In the mountain region, 14.14 miles were evaluated on 20 sites. The percentage of miles in BMP Compliance was 97.0%. A total of 169 BMPs were evaluated of which and 92.3% were implemented. There were no water quality risks identified.

In the Piedmont, approximately 57.13 miles of roads were evaluated on 105 sites. Overall the percentage of miles in BMP Compliance was 84.5%. A total of 781 BMPs were evaluated of which 88.1% were implemented. There were 18 water quality risks identified.

In the Upper Coastal Plain, 52.68 miles of road were evaluated on 77 sites. Overall the percentage of miles in BMP Compliance was 96.9% and BMP Implementation was 93.1%. There were 2 water quality risks identified.

In the Lower Coastal Plain, 128.88 miles of road were evaluated on 134 sites. Overall the percentage of miles in BMP Compliance was 92.9% and BMP Implementation was 91.3%. There was 1 water quality risk identified.

Roads by Ownership

On NIPF lands, a total of 150.37 miles of road were evaluated on 254 sites. Overall the percentage of miles in BMP Compliance was 90.6% and ranged from a low of 78.3% in the Piedmont to a high of 95.9% in the Upper Coastal Plain. Overall BMP Implementation was 90.1% and ranged from a low of 85.7% in the Piedmont to a high of 93.4% in the Lower Coastal Plain. There were a total of 21 water quality risks identified, with the majority (18) occurring in the Piedmont. The main findings and concerns were that roads were well drained with diversion measures only on 65.6% of the sites and were reshaped and stabilized only on 78.7% of the sites.

On forest industry lands, a total of 89.75 miles of road was evaluated on 72 sites. Overall the percentage of miles in BMP Compliance was 95.1% and ranged from a low of 92.2% in the Lower Coastal Plain to a high of 99.9% in the Mountains. Overall BMP implementation was 95.3% and ranged from a low of 91.3% in the

Lower Coastal Plain to a high of 99.0 % in the Upper Coastal Plain. There were no water quality risks identified in the Piedmont.

On Corporate (TIMO) lands, a total of 10.04 miles on 4 sites was evaluated, all in the Lower Coastal Plain. Overall the percentage of miles in BMP Compliance was 85.1%. Overall BMP Implementation was 96.0%, with no water quality risks.

On public lands, a total of 2.67 miles of road was evaluated on 6 sites. Overall the percentage of miles in BMP Compliance was 98.1% and ranged from a low of 94.6% in the Piedmont to highs of 100% in the Mountains and the Upper Coastal Plain. Overall BMP Implementation was 90.9% and ranged from a low of 85.7% in the Upper Coastal Plain to highs of 100% in the Mountains. There were no water quality risks identified.

SPECIAL MANAGEMENT AREAS

This category applies to areas of headwaters and other types of natural and man-made channels that could possibly transport sediments and other pollutants into other waterbodies. These areas should be provided some measure of protection, but normally do not need to be treated as streams. These areas include ephemeral areas, canals, ditches, gullies, seeps, sinkholes, and isolated sloughs and wetlands, including riverine floodplains. New headwater BMPs for ephemeral areas and gullies are in the process of being adopted, but for this survey period, the BMP implementation data for these headwater areas is not being reported. This section only contains data pertaining to Canals and Ditches, and to Riverine Floodplains.

Statewide, there were 26 sites with canals and ditches that were evaluated and 33 sites with riverine floodplain features. Overall BMP implementation was 91.8%. There were 4 water quality risks identified.

TIMBER HARVESTING OUTSIDE OF SMZs

Outside of SMZs, timber harvesting poses little threat to water quality in Georgia. Potential impacts can be avoided or minimized if seasonal weather conditions, soil type, soil moisture, topography, and matching the type of equipment to use with the site are considered. The location, construction, and maintenance of log decks and skid trails are the primary concerns.

Table 4, page 33, provides a summary of the results by ownership, region and state total. Approximately 24,971 acres were evaluated on 335 sites. Approximately 99.8% were in compliance with BMPs. A total of 3,210 applicable BMPs were evaluated of which 97.4% were fully implemented. A total of 16 water quality risks were identified.

A total of 856 log decks were evaluated of which 98.5% were in compliance. A total of 1,526 main skid trails were evaluated of which 95.5% were in compliance.

Other significant findings and areas for improvement include:

- Number and size of log decks were minimized on 100% of sites.
- Log decks were located properly on stable, well-drained areas on 99.7% of sites
- Log decks were stabilized on 100% of erodible sites.

- Main skid trails on rolling terrain were adequately water barred and stabilized on 98.2% of sites. No water quality risks were identified.
- Rutting was minimized on 94.6% of wetlands or sites with saturated soils. One water quality risk was identified.

Timber Harvesting by Region

In the mountain region, 1,314 acres were evaluated on 23 sites. The percentage of acres in BMP Compliance was 99.9% and BMP Implementation was 98.3% with 1 water quality risk identified. There were 51 log decks on those sites with 100% in compliance with BMPs. There were 84 main skid trails with 97.6% in compliance with BMPs.

In the Piedmont, 7,394 acres were evaluated on 109 sites. The percentage of acres in BMP Compliance was 99.6% and BMP Implementation was 94.5% with 14 water quality risks identified. There were 237 log decks evaluated of which 97.1% were in compliance. There were 553 main skid trails with 91.5% in compliance.

In the Upper Coastal Plain, 5,565 acres were evaluated on 75 sites. The percentage of acres in BMP Compliance was 99.9% and BMP Implementation was 98.5% with 1 water quality risk identified. There were 166 log decks evaluated of which 100% were in compliance. There were 307 main skid trails evaluated of which 98.1% were in compliance.

In the Lower Coastal Plain, 10,699 acres were evaluated on 128 sites. The percentage of acres in BMP Compliance was 99.8% and BMP Implementation was 99.3% with no water quality risks identified. There were 402 log decks evaluated of which 98.5% were in compliance. There were 582 main skid trails evaluated of which 97.6% were in compliance.

Harvesting By Ownership

On NIPF lands, 17,069 acres were evaluated on 267 sites. The percentage of acres in BMP Compliance was 99.7% and ranged from a low of 99.4% in the Piedmont to a high of 99.9% in the Upper Coastal Plain. Overall BMP Implementation was 96.7% and ranged from a low of 93.3% in the Piedmont to a high of 99.2% in the Lower Coastal Plain. There were a total of 16 water quality risks identified with the majority of 14 occurring in the Piedmont. Significant findings and concerns were that skid trails on rolling or steep terrain should have been stabilized and retired better. Implementation rates were 81.9% for this BMP.

On forest industry land, 6969 acres were evaluated on 58 sites. The percentage of acres in BMP Compliance was 99.9% and ranged from a low of 99.0% in the Lower Coastal Plain to highs of 100% in the other three regions. Overall BMP implementation was 99.8% and ranged from a low of 99.5% in the Lower Coastal Plain to a high of 100% in the other three regions. There were no water quality risks identified.

On Corporate (TIMO) lands, 586 acres were evaluated on 3 sites. The percentage of acres in BMP Compliance was 100%. Overall BMP Implementation was 100%. There were no water quality risks identified.

On Public land, 347 acres were evaluated on 7 sites. The percentage of acres in BMP Compliance was 100%. Overall BMP Implementation was 100%. There were no water quality risks identified.

MECHANICAL SITE PREPARATION OUTSIDE SMZs

Site preparation methods prepare harvested and non-forested areas for both natural and artificial regeneration for desired tree species and stocking. Methods include shearing, raking, sub-soiling, chopping, windrowing, piling, and bedding, and other physical methods to cut, break apart, or move logging debris, or improve soil conditions prior to planting. The purpose is to reduce logging debris, lessen logging impacts, control competing vegetation, and enhance seedling survival. The technique or method(s) used depends on soil type, topography, erodibility, condition of the site, and any wetland limitations.

Table 5, page 34, provides a summary of the results by region, ownership and state totals. Statewide, approximately 3,520 acres were evaluated on 34 sites. Approximately 99.9% were in compliance with BMPs. A total of 88 applicable BMPs were evaluated of which 94.3% were fully implemented. No water quality risks were identified.

Significant findings include:

- Site prep bedding avoided directing surface runoff into roadways and road ditches on 77.3% of the sites.
- Mechanical site prep for pine regeneration in wetlands identified in EPA/Corps of Engineers memo did not occur on any applicable sites surveyed.

Mechanical Site Prep by Region

In the mountains, no sites were evaluated.

In the Piedmont, 61 acres were evaluated on 1 site. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100.0% with no water quality risks identified.

In the Upper Coastal Plain, 872 acres were evaluated on 7 sites. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100.0% with no water quality risks identified.

In the Lower Coastal Plain, 2,586 acres were evaluated on 26 sites. The percentage of acres in BMP Compliance was 99.9% and BMP Implementation was 93.2% with no water quality risk identified.

Mechanical Site Prep by Ownership

On NIPF lands, approximately 1,111 acres of mechanical site prep were evaluated on 19 sites. Overall the percentage of acres in BMP Compliance was 100% on the sites in the Piedmont, Upper and Lower Coastal Plains. No sites were evaluated in the mountains. Overall BMP Implementation was 100% in all three regions. No water quality risks were identified.

On forest industry land, approximately 2,225 acres were evaluated on 13 sites in the Upper and Lower Coastal Plains. No sites were evaluated in the mountains or Piedmont. Overall the percentage of acres in BMP Compliance was 99.9%. BMP implementation was 84.9% and ranged from a low of 81.5% in the Lower Coastal Plain to a high of 100% in the Upper Coastal Plain. No water quality risks were identified. All BMPs

were implemented 100% except for site preparation bedding avoided directing surface runoff into roadbeds and ditches on 77.3% of the sites.

On Corporate (TIMO) lands, approximately 184 acres were evaluated on 2 sites, which occurred in the Lower Coastal Plain. Overall the percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%.

There were no mechanical site preparation sites evaluated on Public lands.

CHEMICAL SITE PREPARATION OUTSIDE SMZs

Herbicides are valuable tools used in forest management to control competing vegetation and enhance tree survival and growth. On many highly erodible sites, the use of herbicides is actually better than exposing so much surface area by mechanical site preparation methods. By following EPA approved labels that govern storage, transportation, handling, and application their applications should not pose any threat to water quality.

Table 6, page 35, provides a summary of the results by region, ownership, and state totals. Statewide, approximately 2,296 acres were evaluated on 24 sites. Overall the percentage of acres in BMP Compliance was 99.99%. A total of 48 BMPs were evaluated of which 97.9% were fully implemented. No water quality risks were identified.

Chemical Site Prep by Region

In the mountain region, 276 acres were evaluated on 5 sites, all of which were on forest industry lands. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%.

In the Piedmont region, 630 acres were evaluated on 5 sites. The percentage of acres in BMP compliance was 100% and BMP Implementation was 100%.

In the Upper Coastal Plain region, 997 acres were evaluated on 8 sites. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%.

In the Lower Coastal Plain region, 394 acres were evaluated on 6 sites. The percentage of acres in BMP Compliance was 99.99% and BMP Implementation was 91.7%.

Chemical Site Prep by Ownership

For the NIPF land, approximately 1,166 acres were evaluated on 12 sites. Two sites were located in the Piedmont and 1 site was in the Lower Coastal Plain. Four sites were evaluated in the mountains and five in the Upper Coastal Plain regions. Overall the percentage of acres in BMP Compliance was 100%. Overall BMP Implementation was also 100%.

For the forest industry land, approximately 1,097 acres were evaluated on 11 sites. Overall, the percentage of acres in BMP Compliance was 99.99% and BMP Implementation was 95.5%.

For Corporate (TIMO) lands, approximately 33 acres were evaluated on 1 site which occurred in the Lower Coastal Plain. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%.

No chemical site preparation sites were evaluated on any publicly owned lands.

FIREBREAK CONSTRUCTION

Controlled fire is often used alone or in conjunction with chemical or mechanical site preparation to prepare sites for regeneration. It may also be used during timber stand management to control or reduce hazardous accumulations of forest fuels, manage competing vegetation, improve wildlife habitat, and to perpetuate certain endangered plant and animal ecosystems. When properly planned and conducted, firebreaks and controlled fire have minimal impacts on water quality. However, firebreaks and fires that expose significant mineral soil on moderate and steep slopes may increase erosion potential.

Table 7, page 36, provides a summary of the firebreak results by region, ownership, and state totals. Approximately 77.40 miles of breaks were evaluated on 37 sites. Overall the percentage of miles in BMP Compliance was 78.9%. A total of 160 BMPs were evaluated on these sites of which 67.5% were fully implemented. A total of 3 water quality risks were identified.

Other significant findings and areas for improvement include:

- On slopes > 3%, water bars or turnouts were constructed in pre-suppression firebreaks on 26.1% of sites.
- Water bars or turnouts were installed in pre-suppression breaks at approaches to SMZs, roads and gullies on 27.8% of sites.
- Pre-suppression firebreaks were back bladed away from the edge of streams or roads on 36.8% of sites.
- Prescribed burning minimized soil exposure on 95.7% of sites. During the 2004 survey this figures was 92.6%.
- Wildfire breaks had not been rehabbed with appropriate water diversion measures on the one site where they occurred resulting in a 0% implementation for this BMP.

Firebreaks by Region

In the mountain region, 9.11 miles were evaluated on 5 sites. The percentage of miles in BMP Compliance was 74.7% and BMP Implementation was 63%. There were no water quality risks identified.

In the Piedmont region, 23.35 miles of firebreaks were evaluated on 8 sites. The percentage of miles in BMP Compliance was 71.8% and BMP Implementation was 54.2% with 1 water quality risk identified.

In the Upper Coastal Plain region, 27.59 miles of firebreak were evaluated on 11 sites. The percentage of miles in BMP Compliance was 75.8% and BMP implementation was 73.9%.

In the Lower Coastal Plain region, there were 17.34 miles of pre-suppression firebreaks evaluated on 13 sites of which 95.4% of the miles were in compliance. BMP Implementation was 79.5% with 2 water quality risks.

Firebreaks by Ownership

For the NIPF lands, approximately 69.8 miles of firebreaks were evaluated on 33 sites of which 81.2% of miles were in compliance. BMP Compliance ranged from a low of 75.8% for NIPF lands in the Upper Coastal Plain to a high of 95.3 % in the Lower Coastal Plain. BMP Implementation was 67.4% and ranged from a low of 54.8% in the Piedmont to a high of 78.1% in the Lower Coastal Plain. Three water quality risks were identified with 2 being in the Lower Coastal Plain. Significant findings were that water diversions were adequately installed in pre-suppression breaks on only 28.6% of sites. Pre-suppression breaks were back bladed away from the edge of streams or roads on only 31.3% of sites. Water bars or turnouts were installed at approaches to SMZs, roads, and gullies on only 20.0% of sites.

For forest industry lands, there were 6.3 miles of pre-suppression breaks evaluated on 3 sites of which 55.5% of the miles were in compliance with BMPs. Compliance ranged from a low of 27.0% in the Piedmont to a high of 96.1% in the Lower Coastal Plain. No sites were evaluated in the mountains or Upper Coastal Plain. BMP Implementation was 69.2% and ranged from a low of 50.0% in the Piedmont to a high of 85.7% in the Lower Coastal Plain. No water quality risks were identified on industry lands.

For Public lands there were 1.3 miles of pre-suppression breaks evaluated on one site in the Mountains, of which 67.9% of the miles were in compliance. The overall BMP Implementation rate was 66.7%. Specific findings on this site indicate that water diversions were not adequately installed, nor were the breaks installed along the contour of the land. No water quality risks were associated with this site.

No firebreaks were evaluated on Corporate (TIMO) Lands.

CONTROL BURNING OUTSIDE SMZs

Table 8, page 37, provides a summary of the control burned sites by region, ownership and state totals. Approximately 2397.7 acres were evaluated on 23 sites. Overall the percentage of acres in BMP Compliance was 99.9%. A total of 23 BMPs were evaluated and overall BMP Implementation was 92.6%. No water quality risks were identified.

Burning by Region

In the mountain region, approximately 544.7 acres of controlled burning were evaluated on 5 sites. The percentage of acres in BMP compliance was 99.9%. BMP implementation was 80.0% with no water quality risks identified.

In the Piedmont region, 502.4 acres were evaluated on 4 sites. The percentage of acres in compliance was 100% with BMP implementation at 100%. No water quality risks were identified.

In the Upper Coastal Plain, 841.1 acres were evaluated on 8 sites. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100% with no water quality risks identified.

In the Lower Coastal Plain region, 509.6 acres were evaluated on 6 sites. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100% with no water quality risks identified.

Burning by Ownership

On NIPF, approximately 2,092.7 acres of controlled burning were evaluated on 22 sites. Overall the percentage of acres in BMP Compliance was 99.9% and ranged from a low of 99.8% in the Piedmont to highs of 100% in the Lower Coastal Plain. Overall BMP Implementation was 95.5%. There were no water quality risks identified.

There were no forest industry lands or Corporate (TIMO) lands evaluated for controlled burning.

For Public lands, approximately 305 acres of controlled burning were evaluated on 1 site in the Mountains. The percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%, with no water quality risks. No public sites were evaluated for controlled burning in the Upper or Lower Coastal Plain or Piedmont.

ARTIFICIAL REGENERATION OUTSIDE SMZs

Reforestation can be accomplished artificially or naturally. Natural regeneration and hand planting generally pose less of a threat to water quality as opposed to mechanical methods.

Table 9, page 38, provides a summary of the results by region, ownership and state totals. Approximately 2,622 acres were evaluated on 32 sites. Overall the percentage of acres in BMP Compliance was 100%. A total of 56 BMPs were evaluated and overall BMP Implementation was 100%. No water quality risks were identified.

Significant findings include:

- Machine planting on slopes of 5 -20% generally followed the contour on 100% of sites. No water quality risks were identified.
- On slopes > 21%, hand planting was conducted on 100% of sites.
- Pine establishment was avoided on specified wetlands identified in the EPA/COE memo

Regeneration by Region

In the mountain region, approximately 341 acres were evaluated on 7 sites. Overall the percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%. No water quality risks were identified.

In the Piedmont region, approximately 583 acres were evaluated on 5 sites. Overall the percentage of acres in BMP Compliance was 100% and BMP Implementation was 100%. No water quality risks were identified.

In the Upper Coastal Plain region, approximately 860 acres were evaluated on 8 sites. Overall the percentage of acres in BMP Compliance was 100% and BMP Implementation was 100% with no water quality risks identified.

In the Lower Coastal Plain region, approximately 838 acres were evaluated on 12 sites. Overall the percentage of acres in BMP Compliance was 100% and BMP Implementation was 100% with no water quality risk identified.

Regeneration by Ownership

On NIPF land, approximately 1,719 acres were evaluated on 21 sites. Overall the percentage of acres in BMP Compliance was 100%. Overall BMP Implementation was 100% with no water quality risks identified.

For forest industry land, approximately 870 acres were evaluated on 10 sites. Overall the percentage of acres in BMP Compliance was 100%. Overall BMP Implementation was 100%. No water quality risks were identified.

For Corporate (TIMO) lands, 33 acres were evaluated on 1 site in the Lower Coastal Plain region. BMP Compliance and Implementation rates were 100%.

No artificial regeneration sites were evaluated for public lands.

FOREST FERTILIZATION OUTSIDE SMZs

Forest fertilization is a valuable silvicultural practice that enhances tree survival and growth. The primary nutrients applied are nitrogen and phosphorous. Applications should not be directed into water bodies or into SMZs. When conducted properly, forest fertilization poses little threat to water quality. No forest fertilization practices were evaluated for this survey cycle.

EQUIPMENT WASHING AND SERVICING

Improper equipment washing and servicing can introduce hazardous or toxic materials to the site, which can affect water quality. Oils, lubricants, their containers and other trash and waste should be disposed of properly. According to GA EPD Emergency Response Program, fuel and oil spills should be immediately contained and cleaned up. In addition, chemical spills of twenty-five gallons or more of fuel and oil to soils, or spills of fuels or oils into waterways which produce a visible sheen should be immediately contained, cleaned up, and reported to GA EPD.

Table 10, page 39, provides a summary of the results by region, ownership and state totals. A total of 346 sites were evaluated. A total of 1,033 BMPs were evaluated of which 98.6% were implemented. Implementation ranged from a low of 97.7% in the Upper Coastal Plain to a high of 100% in the Mountains. No water quality risks were identified.

Significant findings and areas for improvement include:

- Equipment was serviced or washed away from areas including ephemeral areas, which may create a water quality problem on 99.7% of sites.
- Oils, lubricants and containers were disposed of properly on 98.3% of sites.
- Trash, tires, batteries associated with the operation were removed or disposed of properly on 98.0% of sites.

Equipment Servicing by Region

In the mountain region, a total of 68 BMPs were evaluated on 23 sites. Overall BMP Implementation was 100%.

In the Piedmont region, a total of 324 BMPs were evaluated on 108 sites. Overall BMP Implementation was 98.2%.

In the Upper Coastal Plain region, a total of 218 BMPs were evaluated on 73 sites. Overall BMP Implementation was 97.7%.

In the Lower Coastal Plain region, a total of 423 BMPs were evaluated on 142 sites. Overall BMP Implementation was 99.3%.

Equipment Servicing By Ownership

On 268 NIPF sites a total of 800 BMPs were evaluated for equipment servicing. Overall BMP Implementation was 98.5% and ranged from a low of 97.3% in the Upper Coastal Plain to a high of 100% in the Mountains.

For forest industry land, a total of 200 BMPs were evaluated on 67 sites. Overall BMP Implementation was 99.0% and ranged from a low of 97.9% in the Piedmont to highs of 100% in the mountains and Upper Coastal Plain.

For Corporate (TIMO) lands, a total of 12 BMPs were evaluated on 4 sites in the Lower Coastal Plain. Overall BMP Implementation was 100% and compliance was also 100%.

For Public land, a total of 21 BMPs were evaluated on 7 sites. Overall BMP Implementation was 100%.

OVERALL STREAM ASSESSMENTS

Perhaps the most important observation in assessing the effectiveness of BMPs was the visual assessment of the water bodies on each site. A total of 364 streams encompassing approximately 129.0 miles on 51 sites were evaluated for visual signs of impairment. Those signs include obvious soil erosion entering the stream, logging debris left in the channel, improper stream crossings resulting in blocked flow, removal of excess canopy trees within the SMZs exposing the stream to elevated temperatures, or the stream bank or channel integrity has been impaired by forestry practices.

Table 11, page 40, provides a summary of the results by region, ownership, and state totals by stream type. Overall a total of 129.0 miles of perennial and intermittent streams were evaluated statewide. The number of miles in BMP compliance was 118.9 or 92.2%. Compliance ranged from a low of 73.6% in the mountains to a high of 96.8% in the Upper Coastal Plain.

A total of 46.2 miles of perennial stream were assessed on these sites. The number of miles in compliance was 40.7 or 88.0% and ranged from a low of 61.1% in the mountains to a high of 98.9% in the Upper Coastal Plain.

A total of 82.8 miles of intermittent stream were assessed on these sites. The number of miles in compliance was 78.2 or 94.5% and ranged from a low of 84.3% in the mountains to a high of 95.8% in the Piedmont. It was suspected that, because of several years of drought, the intermittent streams would be more difficult to recognize, especially in the Lower Coastal Plain, and that these streams might experience more impairment, but this did not materialize.

Significant findings and areas for improvement include:

- 154 water quality risks were identified statewide.
- There were 80 risks (52% of the total) involving stream crossings:
 - The lack of water diversions at the stream approaches was the number one area of concern and accounted for 11.8% of the 154 risks found statewide.
 - Improper culvert sizes and/or debris crossings that restricted flow accounted for 11.0% of all the water quality risks.
 - Even though there were 49 skidder fords, their impact only resulted in 9.7% of the 154 risks.
 - The lack of stabilization of exposed soil over culverts accounted for 5.2% of the risks.
- Forest roads accounted for 21 risks (approximately 13.6% of the total):
 - The lack of installing water diversions at SMZ boundaries accounted for 42.9% of those 21 water quality risks.
 - The lack of reshaping and stabilizing roads accounted for 23.8% of those 21 water quality risks.
- Within the SMZ, there were 30 risks or 19.5% of the state total of 154:
 - Some water diversions on pre-existing and new roads actually directed runoff into streams and accounted for 26.7% of the 30 risks identified with SMZs.
 - The lack of stabilization on roads within SMZs accounted for 6.7% of the 30 risks.
 - Removal of more than the recommended number of trees accounted for 6.7% of the risks.
- Harvesting practices resulted in 16 risks or approximately 10.4% of the state total of 154 water quality risks. The biggest concern was the lack of retiring skid trails that led into SMZs, which accounted for 50% of those 16 risks.
- Installation of firebreaks resulted in 3 risks or approximately 2% of the 154 total risks. Mainly the lack of installing water diversion measures at stream approaches accounted for 2 of the 3 risks.
- The remaining practices contributed less than 2% of the total risks each.

Stream Compliance by Region

In the mountains, a total of 8.23 miles of stream were assessed on 2 sites. Overall the percentage of miles in BMP Compliance was 73.6%. There were 4 water quality risks identified.

In the Piedmont, a total of 43.6 miles of stream were assessed on 28 sites. Overall the percentage of miles in BMP Compliance was 95.2%. There were 94 water quality risks identified.

In the Upper Coastal Plain, 25.3 miles were assessed on 11 sites. Overall the percentage of miles in BMP Compliance was 96.8%. There were 22 water quality risks identified.

In the Lower Coastal Plain, 51.9 miles of stream were assessed on 10 sites. Overall the percentage of miles in BMP Compliance was 90.3%. There were 25 water quality risks identified.

Stream Compliance by Ownership

On 38 NIPF sites, approximately 89.1 miles of stream were assessed. Overall the percentage of miles in BMP Compliance was 89.8% and ranged from a low of 54.4% in the mountains to a high of 96.9% in the Upper Coastal Plain. A total of 145 water quality risks were identified. This represents 94.2% of the total 154 water quality risks occurring statewide across all ownerships. The majority of the risks (94 or 64.8%) occurred in the Piedmont. Stream crossings accounted for 51 or 33.1% of the total 154 risks followed by roads and then practices within the SMZs as described above in the significant findings.

On forest industry land, approximately 33.25 miles of stream were assessed on 11 sites. Overall the percentage of miles in BMP Compliance was 97.3% and ranged from a low of 77.5% in the mountains to a high of 99.9% in the Lower Coastal Plain. There were 9 water quality risks identified statewide. This represents 16.7% of the 154 total risks occurring statewide across all ownerships. The majority of the risks (6) found on industry lands occurred in the Upper Coastal Plain and 4 involved stream crossings.

On Corporate (TIMO) lands, 3.79 miles of stream were assessed on 1 site in the Lower Coastal Plain. Stream miles in compliance was 99.5%. There were no water quality risks identified.

On Public land, approximately 2.84 miles of stream were assessed on 2 sites. Overall the percentage of stream miles in BMP Compliance was 97.5%. There were no water quality risks identified statewide on public lands for stream assessments.

The overall 92.2% compliance figure in Georgia supports assessments by the US Environmental Protection Agency that silvicultural operations contribute less than 10% of the nonpoint pollution to streams in the United States.

OVERALL STATEWIDE RESULTS

Table 12, page 41, provides the statewide compliance and implementation results of the total number of sites, the acres evaluated, the number of BMPs evaluated, and the number of water quality risks determined by region and ownership. Statewide, approximately 36,878 acres were evaluated on 370 sites. Overall the percentage of acres in BMP Compliance was 99.7%. **This is a 0.3% increase from the 99.4% in the 2004 survey.** A total of 8,967 individual BMPs were evaluated for full implementation. Overall statewide implementation was 91.8%. **This is a 2.0% increase from the 2004 survey.** While these scores are not statistically different from the 2004 survey, **the most significant finding was that the number of significant water quality risks dropped from 220 in the 2004 survey down to 154 in the 2007 survey. This is a reduction or improvement of 30.0%.** Where BMPs were correctly applied, there were no water quality risks identified.

Overall Results by Region

In the mountains, approximately 2,577 acres were evaluated on 25 sites. The percentage of acres in BMP Compliance was 99.2% and BMP Implementation was 92.0%. There were 4 water quality risks identified. *During the 2004 survey, BMP Compliance was 97.0% and BMP Implementation was 80.9% with 23 water quality risks identified.*

In the Piedmont, approximately 9,607 acres were evaluated on 114 sites. The percentage of acres in BMP Compliance was 99.6% and BMP Implementation was 89.3%. There were 97 water quality risks identified, which represents a **39.4% reduction (improvement)** from the 2004 survey. *During the 2004 survey, BMP Compliance was 99.3% and BMP Implementation was 89.0%. The number of water quality risks checked was 160.*

In the Upper Coastal Plain, approximately 9,345 acres were evaluated on 80 sites. The percentage of acres in BMP Compliance was 99.9% and BMP Implementation was 92.7%. There were 28 water quality risks identified, which represents a **64.7% increase** from the 2004 survey. *During the 2004 survey, BMP Compliance was 99.9% and BMP Implementation was 92.7% with 17 water quality risks identified.*

In the Lower Coastal Plain, approximately 15,349 acres were evaluated on 151 sites. The percentage of acres in BMP Compliance was 96.6% and BMP Implementation was 93.3%. There were 25 water quality risks identified which represents a **25% increase** from the 2004 survey. *During the 2004 survey, BMP Compliance was 99.5% and BMP Implementation was 91.4% with 20 water quality risks identified.*

Overall Results by Ownership

On NIPF lands, approximately 23,780 acres were evaluated on 282 sites. The percentage of acres in BMP Compliance was approximately 99.5% and ranged from a low of 99.1% in the mountains to a high of 99.9% in the Lower Coastal Plain. Overall BMP Implementation was 90.6% and ranged from a low of 87.5% in the mountains to a high of 92.5% in the Upper Coastal Plain. There were 145 water quality risks identified with the majority of 94 (65%) occurring in the Piedmont. *During the 2004 survey, BMP Compliance was 99.2% and ranged from a low of 91.0% in the mountain region to a high of 99.8% in the Upper Coastal Plain. BMP Implementation was 86.6% and ranged from a low of 75.0% in the mountain region to a high of 82.2% in the Lower Coastal Plain. The number of water quality risks identified was 213 with the majority 156 (73%) occurring in the Piedmont.*

On forest industry (FI) lands, approximately 11,535 acres were evaluated on 75 sites. The percentage of acres in BMP Compliance was 99.9% and ranged from a low of 98.9% in the mountains to a high of 99.9% in the other three regions. Overall the BMP Implementation was 96.0% and ranged from a low of 95.0% in the Upper Coastal Plain to a high of 97.9% in the Mountains. There were 9 water quality risks identified with 3 of those occurring in the Piedmont. *During the 2004 survey, BMP Compliance was 99.9% and ranged from a low of 99.0% in the mountain region to a high of 99.9% in the Lower Coastal Plain. BMP Implementation was 97.2% and ranged from a low of 92.4% in the mountain region to a high of 97.8% in the Lower Coastal Plain. The number of water quality risks identified was 5 with 3 occurring in the Piedmont.*

On Corporate (TIMO) lands, overall BMP Compliance was 99.9%. Overall BMP implementation was 94.8% with no water quality risks. All sites were in the Lower Coastal Plain.

On Public land, approximately 698 acres were evaluated on 8 sites. The percentage of acres in BMP Compliance was 99.8% and was statistically even across the four regions statewide. Overall BMP Implementation was 88.1% and ranged from a low of 77.8% in the Upper Coastal Plain to a high of 95.3% in the Piedmont. There were no water quality risks identified which represents a **100% reduction or improvement** from the 2004 survey. *During the 2004 survey, BMP Compliance was 98.6% and ranged from a low of 97.6% in the Piedmont region to a high of 100% in the Upper Coastal Plain. BMP Implementation was*

92.2% and ranged from a low of 83.0% in the Mountain region to a high of 100% in the Piedmont region. The number of water quality risks identified was 2.

OVERALL STATEWIDE RESULTS FOR COMPLIANCE AND IMPLEMENTATION BY PRACTICE, REGION, AND OWNERSHIP

Tables 13 and 14, pages 42 and 43, are perhaps the most important tables in this document with regards to where to emphasize further training to improve compliance. They provide an overall summary and comparison of BMP Compliance and Implementation by practice, ownership, and by region. This will help guide future Master Timber Harvester, consulting forester, and landowner training to those ownerships and regions.

More SMZ education is needed for NIPF landowners and managers statewide; stream crossing education is needed statewide across all landownership classes.

Firebreak installation training is needed statewide across all land ownership classes and all providers.

In the Lower Coastal Plain region, training is needed for mechanical site prep providers on forest industry lands.

EVALUATIONS OF BMP COMPLIANCE AND IMPLEMENTATION BY RIVER BASIN

These same type tables and analysis will be extracted for each of the 14 major river basins and sub-basins in Georgia in accordance to the Georgia River Basin Management Plan.

STATEWIDE TRENDS

Tables 15 and 16, pages 44 and 46, provide a summary and comparison of the previous surveys of 1991, 1992, 1998, 2002, and 2004 with the 2007 survey.

Because the 1998 survey broke out the number of acres for SMZs for the first time a comparison could not be made with the previous surveys. This was also the case with stream crossings. Additionally the number of acres for chemical applications and control burning were included with site preparation in the 1992 survey so a direct comparison could not be made. Forest Fertilization and Equipment Servicing were new categories broken out. With the new SGSF protocol, more consistency has been added for a basis for comparison between the practices.

From a BMP compliance standpoint, with the exception of forest roads on NIPF and Public lands, the other practices show improvements with each survey across all ownerships.

Table 15 provides a statewide BMP Compliance summary for each forest practice by ownership, and previous survey results. Significant observations are as follows:

- SMZs – 2.1% decrease in compliance statewide for all landowners
- Stream Crossings – no significant changes overall, slight increase in compliance seen on NIPF lands, and decreases in compliance seen forest industry and on public lands.
- Forest Roads –slight increase on NIPF lands, slight decreases on forest industry and on public lands.
- Harvesting –basically no change with overall compliance at 99.8%.
- Mechanical Site Preparation – basically no change.
- Chemical Applications – 100% across all ownerships
- Firebreak construction – Significant decreases of 14.1% overall. Decrease of 14.4% on NIPF, decrease of 41.1% on forest industry, and decrease of 8.6% on public lands
- Control Burning – remains steady near 100% across all ownerships
- Artificial Regeneration – at or near 100% across all ownerships.
- Fertilization – no sites contained fertilization practices.
- Equipment Servicing - only one year of data.
- Overall – overall, acreage compliance saw steady improvements across all ownerships.
- Stream miles – 92.0% overall represents a decrease of 3.9% in compliance.

CONCLUSION

Since the 1991 survey, the percentage of acres in BMP compliance has increased from 86% to 99.7%. The percentage of BMP implementation has increased from 64.9% to 91.8%. The percentage of stream miles in compliance has decreased to around 92%. Since the 1998 survey, the number of water quality risks has decreased from 544 to 154 or 71.7% (% decrease since 1998).

Existing roads and stream crossings were differentiated from newly constructed forest roads and crossings in this survey. Overall compliance of pre-existing roads was 92.9% and of newly constructed roads was 83.8%. Stream crossings are still a concern. Pre-existing crossings scored 61.1% in compliance. New crossings scored 32.5% in compliance. Skidder fords and debris and dirt crossing made up 60.0% of the non-compliance for new crossings. Otherwise the other **new** type crossings would have scored an 81.3% compliance rate.

New stream crossings, especially culverts and bridges, are expensive to purchase and install. Because stream crossings are often not considered in the negotiation process during a timber sale, the responsibility and costs are often passed to the logger who is often not the timber buyer. Consequently, the type crossings the loggers use are not adequate. Better planning and understanding of who is going to bear the cost of culverted or bridged stream crossings at the time of timber negotiations should result in better compliance. Loggers are being encouraged through training workshops to purchase portable timber bridges that can be reused and are cost effective. This should cut down on the use of temporary culverts, skidder fords, and dirt and debris type crossings.

Future MTH workshops and other BMP training for landowners and foresters should result in improved rates of BMP compliance and implementation resulting in better stream protection. Future topics will include field instruction on installing stream crossings properly, and on proper construction of firebreaks. Another statewide survey is scheduled for 2009.

Bad actors should be dealt with expeditiously and judiciously by the federal, state or local regulatory agencies to ensure a level playing field. The GFC, the Georgia Forestry Association, the University Of Georgia's Warnell School of Forestry and Natural Resources, companies and organizations that participate in the Sustainable Forestry Initiative and the Southeastern Wood Producers Association support this concept. Participants in the SFI process are kept abreast of bad actors. Individual companies can choose to deal with them accordingly. This may include encouraging the bad actor to comply with BMPs or they may choose to not do business with them anymore until the problems are corrected.

TABLE 1: Distribution of Sites with Streamside Management Zones Evaluated By Region Ownership, Acres Evaluated, % Compliance, BMP Assessed, and % BMPs Implemented, and # Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	9	26.28	56.13%	88	79.55%	1	3	35.78	78.06%	20	90.00%	0
Piedmont	60	341.61	97.81%	533	89.31%	10	15	91.49	99.43%	125	97.60%	0
U. C. Plain	31	129.08	96.80%	290	90.34%	12	9	78.27	97.89%	82	92.68%	2
L. C. Plain	58	216.02	84.87%	498	85.94%	5	17	168.05	99.93%	148	97.97%	0
Total	158	712.99	92.17%	1409	87.72%	28	44	373.59	97.29%	375	96.27%	2
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	1	39.01	99.46%	6	66.67%	0	0	0	NA	0	NA	0
Piedmont	2	4.13	99.76%	18	94.44%	0	0	0	NA	0	NA	0
U. C. Plain	1	2	90.00%	10	80.00%	0	0	0	NA	0	NA	0
L. C. Plain	1	0.9	0.00%	8	50.00%	0	3	28.12	99.79%	26	84.62%	0
Total	5	46.04	97.13%	42	78.57%	0	3	28.12	99.79%	26	84.62%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	13	101.07	80.62%	114	80.70%	1						
Piedmont	77	437.23	98.17%	676	90.98%	10						
U. C. Plain	41	209.35	97.14%	382	90.58%	14						
L. C. Plain	79	413.09	91.83%	680	88.09%	5						
Total	210	1160.74	94.20%	1852	89.20%	30						

TABLE 2: Distribution of Sites with Stream Crossings Evaluated by Region, Ownership, and # Crossings Assessed, % Compliance, # BMPs Assessed, % BMPs Implemented and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No Sites	Crossings	% Crossings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Crossings	% Crossings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	6	10	50.00%	77	92.21%	2	3	8	87.50%	43	97.67%	0
Piedmont	33	60	18.33%	395	73.92%	51	6	7	71.43%	81	91.36%	3
U. C. Plain	9	22	40.91%	96	75.00%	5	7	12	50.00%	77	85.71%	4
L. C. Plain	41	92	38.04%	517	85.69%	15	18	55	72.73%	238	95.80%	0
Total	89	184	32.61%	1085	80.92%	73	34	82	70.73%	439	93.39%	7

PUBLIC							CORPORATE (TIMOs)					
Region	No Sites	Crossings	% Crossings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Crossings	% Crossings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	1	2	0.00%	9	44.44%	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Total	1	2	0.00%	9	44.44%	0	0	0	NA	0	NA	0

TOTAL ALL LANDOWNERS						
Region	No Sites	Crossings	% Crossings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	9	18	66.67%	120	94.17%	2
Piedmont	39	67	23.88%	476	76.89%	54
U. C. Plain	17	36	41.67%	182	78.02%	9
L. C. Plain	59	147	51.02%	755	88.87%	15
Total	124	268	44.03%	1533	84.28%	80

TABLE 3: Distribution of Forest Road Sites Evaluated By Region, Ownership, Miles Assessed, % Compliance, # BMP Assessed, % BMPs Implemented, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	13	5.79	92.92%	104	88.46%	0	6	7.2	99.86%	55	98.18%	0
Piedmont	83	40.04	78.32%	619	85.78%	18	18	16.17	99.26%	135	98.52%	0
U. C. Plain	65	39.32	95.91%	450	92.00%	2	11	12.76	99.61%	95	98.95%	0
L. C. Plain	93	65.22	94.69%	587	93.36%	1	37	53.62	92.19%	241	91.29%	0
Total	254	150.37	90.58%	1760	90.06%	21	72	89.75	95.13%	526	95.25%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	1	1.15	100.00%	10	100.00%	0	0	0	NA	0	NA	0
Piedmont	4	0.92	94.57%	27	88.89%	0	0	0	NA	0	NA	0
U. C. Plain	1	0.6	100.00%	7	85.71%	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	4	10.04	85.06%	25	96.00%	0
Total	6	2.67	98.13%	44	90.91%	0	4	10.04	85.06%	25	96.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	20	14.14	97.03%	169	92.31%	0						
Piedmont	105	57.13	84.51%	781	88.09%	18						
U. C. Plain	77	52.68	96.85%	552	93.12%	2						
L. C. Plain	134	128.88	92.90%	853	92.85%	1						
Total	336	252.83	92.06%	2355	91.30%	21						

TABLE 4: Distribution of Harvesting Operations Evaluated By Region, Ownership, Acres Assessed, % Compliance, # BMP Assessed, % Implemented, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	17	747.73	99.73%	128	97.66%	1	6	566.42	100.00%	46	100.00%	0
Piedmont	89	5512.39	99.40%	654	93.27%	14	16	1738.29	100.00%	118	100.00%	0
U. C. Plain	66	4500.99	99.91%	449	98.22%	1	8	936.83	100.00%	60	100.00%	0
L. C. Plain	95	6307.76	99.70%	605	99.17%	0	28	3727.13	99.97%	185	99.46%	0
Total	267	17068.87	99.66%	1836	96.73%	16	58	6968.67	99.98%	409	99.76%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	4	142.94	100.00%	27	100.00%	0	0	0	NA	0	NA	0
U. C. Plain	1	127	100.00%	7	100.00%	0	0	0	NA	0	NA	0
L. C. Plain	2	77.4	100.00%	10	100.00%	0	3	586.28	100.00%	21	100.00%	0
Total	7	347.34	100.00%	44	100.00%	0	3	586.28	100.00%	21	100.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	23	1314.15	99.85%	174	98.28%	1						
Piedmont	109	7393.62	99.55%	799	94.49%	14						
U. C. Plain	75	5564.82	99.93%	516	98.45%	1						
L. C. Plain	128	10698.57	99.81%	821	99.27%	0						
Total	335	24971.16	99.76%	2310	97.36%	16						

TABLE 5: Distribution of Mechanical Site Preparation Operations Evaluated By Region, Ownership, and Acres Assessed, % Compliance, # BMPs Assessed, % BMP Implementation, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	1	61.18	100.00%	1	100.00%	0	0	0	NA	0	NA	0
U. C. Plain	4	267.7	100.00%	7	100.00%	0	3	604.77	100.00%	6	100.00%	0
L. C. Plain	14	781.75	100.00%	43	100.00%	0	10	1620.61	99.83%	27	81.48%	0
Total	19	1110.63	100.00%	51	100.00%	0	13	2225.38	99.87%	33	84.85%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	2	184.09	100.00%	4	100.00%	0
Total	0	0	NA	0	NA	0	2	184.09	100.00%	4	100.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	0	0	NA	0	NA	0						
Piedmont	1	61.18	100.00%	1	100.00%	0						
U. C. Plain	7	872.47	100.00%	13	100.00%	0						
L. C. Plain	26	2586.45	99.89%	74	93.24%	0						
Total	34	3520.1	99.92%	88	94.32%	0						

TABLE 6: Distribution of Chemical Site Preparation Operations Evaluated By Region, Ownership, and Acres Assessed, % Compliance, BMPs Assessed, % BMP Implementation, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	4	233.12	100.00%	8	100.00%	0	1	43	100.00%	2	100.00%	0
Piedmont	2	450.74	100.00%	4	100.00%	0	3	178.79	100.00%	6	100.00%	0
U. C. Plain	5	392	100.00%	10	100.00%	0	3	604.77	100.00%	6	100.00%	0
L. C. Plain	1	0	NA	2	100.00%	0	4	270.91	99.99%	8	87.50%	0
Total	12	1075.86	100.00%	24	100.00%	0	11	1097.47	100.00%	22	95.45%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	1	33	100.00%	2	100.00%	0
Total	0	0	NA	0	NA	0	1	33	100.00%	2	100.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	5	276.12	100.00%	10	100.00%	0						
Piedmont	5	629.53	100.00%	10	100.00%	0						
U. C. Plain	8	996.77	100.00%	16	100.00%	0						
L. C. Plain	6	303.91	99.99%	12	91.67%	0						
Total	24	2206.33	100.00%	48	97.92%	0						

TABLE 7: Distribution of Firebreaks Evaluated By Region, Ownership, Miles Assessed, % Compliance, # BMP Assessed, % Implemented, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	4	7.77	75.93%	21	61.90%	0	0	0	NA	0	NA	0
Piedmont	7	19.65	80.20%	42	54.76%	1	1	3.7	27.03%	6	50.00%	0
U. C. Plain	11	27.59	75.82%	46	73.91%	0	0	0	NA	0	NA	0
L. C. Plain	11	14.75	95.25%	32	78.13%	2	2	2.59	96.14%	7	85.71%	0
Total	33	69.76	81.18%	141	67.38%	3	3	6.29	55.48%	13	69.23%	0

PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	1	1.34	67.91%	6	66.67%	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Total	1	1.34	67.91%	6	66.67%	0	0	0	NA	0	NA	0

TOTAL ALL LANDOWNERS						
Region	No. Sites	Miles	% Miles Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	5	9.11	74.75%	27	62.96%	0
Piedmont	8	23.35	71.78%	48	54.17%	1
U. C. Plain	11	27.59	75.82%	46	73.91%	0
L. C. Plain	13	17.34	95.39%	39	79.49%	2
Total	37	77.39	78.86%	160	67.50%	3

TABLE 8: Distribution of Control Burned Sites Evaluated By Region, Ownership, Acres Assessed, % Compliance, BMPs Assessed, % BMP Implementation, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	4	239.66	99.90%	4	75.00%	0	0	0	NA	0	NA	0
Piedmont	4	502.36	100.00%	4	100.00%	0	0	0	NA	0	NA	0
U. C. Plain	8	841.1	100.00%	8	100.00%	0	0	0	NA	0	NA	0
L. C. Plain	6	509.6	100.00%	6	100.00%	0	0	0	NA	0	NA	0
Total	22	2092.72	99.99%	22	95.45%	0	0	0	NA	0	NA	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	1	305	100.00%	1	100.00%	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Total	1	305	100.00%	1	100.00%	0	0	0	NA	0	NA	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	5	544.66	99.95%	5	80.00%	0						
Piedmont	4	502.36	100.00%	4	100.00%	0						
U. C. Plain	8	841.1	100.00%	8	100.00%	0						
L. C. Plain	6	509.6	100.00%	6	100.00%	0						
Total	23	2397.72	99.99%	23	95.65%	0						

TABLE 9: Distribution of Artificial Regeneration Operations Evaluated By Region, Ownership, Acres Assessed, % Compliance, BMPs Assessed, % BMP Implementation, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	6	297.62	100.00%	10	100.00%	0	1	43	100.00%	2	100.00%	0
Piedmont	3	511.92	100.00%	7	100.00%	0	2	71	100.00%	4	100.00%	0
U. C. Plain	6	387.4	100.00%	10	100.00%	0	2	473	100.00%	4	100.00%	0
L. C. Plain	6	522.06	100.00%	11	100.00%	0	5	282.63	100.00%	7	100.00%	0
Total	21	1719	100.00%	38	100.00%	0	10	869.63	100.00%	17	100.00%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	0	0	NA	0	NA	0	0	0	NA	0	NA	0
U. C. Plain	0	0	NA	0	NA	0	0	0	NA	0	NA	0
L. C. Plain	0	0	NA	0	NA	0	1	33	100.00%	1	100.00%	0
Total	0	0	NA	0	NA	0	1	33	100.00%	1	100.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	7	340.62	100.00%	12	100.00%	0						
Piedmont	5	582.92	100.00%	11	100.00%	0						
U. C. Plain	8	860.4	100.00%	14	100.00%	0						
L. C. Plain	12	837.69	100.00%	19	100.00%	0						
Total	32	2621.63	100.00%	56	100.00%	0						

NOTE: No sites were evaluated which contained any Forest Fertilization Operations.

TABLE 10: Distribution of Equipment Servicing Operations Evaluated By Region, Ownership, No. of Landings Assessed, BMPs Assessed, % BMP Implementation, and Water Quality Risks

NIPF							FOREST INDUSTRY					
Region	No. Sites	Landings	% Landings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Landings	% Landings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	17	32	100.00%	50	100.00%	0	6	16	100.00%	18	100.00%	0
Piedmont	88	169	98.22%	264	98.11%	0	16	45	97.78%	48	97.92%	0
U. C. Plain	61	109	98.17%	182	97.25%	0	11	24	100.00%	33	100.00%	0
L. C. Plain	102	221	98.64%	304	99.34%	0	34	144	99.31%	101	99.01%	0
Total	268	531	98.49%	800	98.50%	0	67	229	99.13%	200	99.00%	0
PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Landings	% Landings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Landings	% Landings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	0	0	NA	0	NA	0	0	0	NA	0	NA	0
Piedmont	4	5	100.00%	12	100.00%	0	0	0	NA	0	NA	0
U. C. Plain	1	1	100.00%	3	100.00%	0	0	0	NA	0	NA	0
L. C. Plain	2	3	100.00%	6	100.00%	0	4	11	100.00%	12	100.00%	0
Total	7	9	100.00%	21	100.00%	0	4	11	100.00%	12	100.00%	0
TOTAL ALL LANDOWNERS												
Region	No. Sites	Landings	% Landings Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks						
Mountains	23	48	100.00%	68	100.00%	0						
Piedmont	108	219	98.17%	324	98.15%	0						
U. C. Plain	73	134	98.51%	218	97.71%	0						
L. C. Plain	142	379	98.94%	423	99.29%	0						
Total	346	780	98.72%	1033	98.64%	0						

TABLE 11: Distribution of Stream Types, Miles Assessed, and % Compliance By Region, and Ownership

NIPF							FOREST INDUSTRY					
Region	No. Sites	Intermittent Miles Assessed	% Miles Compliance	Perennial Miles Assessed	% Miles Compliance	Total % Miles Compliance	No. Sites	Intermittent Miles Assessed	% Miles Compliance	Perennial Miles Assessed	% Miles Compliance	Total % Miles Compliance
Mountains	1	2.38	79.41%	1.29	22.48%	59.40%	1	2.07	89.86%	0.91	49.45%	77.52%
Piedmont	23	18.22	93.03%	14.28	93.98%	93.45%	5	8.19	99.27%	2.37	95.78%	98.48%
U. C. Plain	7	8.27	92.26%	9.33	101.07%	96.93%	4	3.26	99.39%	3.91	93.86%	96.37%
L. C. Plain	7	26.98	92.59%	8.37	64.76%	86.00%	2	9.55	100.00%	3.19	99.69%	99.92%
Total	38	55.85	92.12%	33.27	85.84%	89.78%	12	23.07	98.74%	10.38	92.20%	96.71%

PUBLIC							CORPORATE (TIMOs)					
Region	No. Sites	Intermittent Miles Assessed	% Miles Compliance	Perennial Miles Assessed	% Miles Compliance	Total % Miles Compliance	No. Sites	Intermittent Miles Assessed	% Miles Compliance	Perennial Miles Assessed	% Miles Compliance	Total % Miles Compliance
Mountains	0	0	NA	1.58	99.37%	99.37%	0	0	NA	0	NA	0
Piedmont	1	0.37	100.00%	0.35	100.00%	100.00%	0	0	NA	0	NA	0
U. C. Plain	0	0.5	96.00%	0	NA	96.00%	0	0	NA	0	NA	0
L. C. Plain	0	0.04	0.00%	0	NA	0.00%	1	3.19	99.37%	0.6	100.00%	99.47%
Total	1	0.91	93.41%	1.93	99.48%	97.54%	1	3.19	99.37%	0.6	100.00%	99.47%

TOTAL ALL LANDOWNERS						
Region	No. Sites	Intermittent Miles Assessed	% Miles Compliance	Perennial Miles Assessed	% Miles Compliance	Total % Miles Compliance
Mountains	2	4.45	84.27%	3.78	61.11%	73.63%
Piedmont	29	26.78	95.03%	17	94.35%	94.77%
U. C. Plain	11	12.03	94.35%	13.24	98.94%	96.76%
L. C. Plain	10	39.76	94.82%	12.16	75.66%	90.33%
Total	52	83.02	94.25%	46.18	88.03%	92.03%

TABLE 12: Overall Distribution of Sites Evaluated By Region, Ownership, Acres Evaluated, % Compliance, BMPs Assessed, % BMPs Implemented, and Water Quality Risks

Region	NIPF						FOREST INDUSTRY					
	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	18	1,544.4	99.1	492	90.24	4	6	680.4	98.9	186	97.9	0
Piedmont	91	7,380.2	99.5	2,527	87.5	94	19	2,079.6	99.9	523	96.9	3
U. C. Plain	68	6,518.3	99.9	1,580	92.5	22	11	2,697.6	99.9	363	95.0	6
L. C. Plain	105	8,337.19	99.38	2,658	92.4	25	39	6,069.3	99.9	1,012	95.6	0
Total	282	23,780.1	99.5	7,257	90.6	145	75	11,534.7	99.9	2,084	96.0	9

Region	CORPORATE (TIMOs)					
	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	1	344.0	99.9	23	82.6	0
Piedmont	4	147.1	99.9	85	95.3	0
U. C. Plain	1	129.0	99.8	36	77.8	0
L. C. Plain	2	78.3	98.9	24	83.3	0
Total	8	698.4	99.8	168	88.1	0

TOTAL ALL LANDOWNERS						
Region	No. Sites	Acres	% Acres Compliance	BMPs Assessed	% BMPs Implemented	WQ Risks
Mountains	25	2,576.6	99.2	701	92.0	4
Piedmont	114	9,606.8	99.6	3,135	89.3	97
U. C. Plain	80	9,344.9	99.9	1,979	92.7	28
L. C. Plain	151	15,349.3	99.6	3,790	93.3	25
Total	370	36,877.7	99.7	9,605	91.8	154

TABLE 13: % BMP Compliance by Practice, Region, and Ownership

Practice	Mountain				Piedmont				Upper Coastal Plain			
	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public
SMZs (acres)	56.1%	78.1%	N/A	99.5%	97.8%	99.4%	N/A	99.8%	96.8%	97.9%	N/A	90.0%
Stream Xings (#)	50.0%	87.5%	N/A	N/A	18.3%	71.4%	N/A	N/A	40.9%	50.0%	N/A	0%
Forest Roads (miles)	92.9%	99.9%	N/A	100%	78.3%	99.3%	N/A	94.6%	95.9%	99.6%	N/A	100%
Harvesting (acres)	99.7%	100%	N/A	N/A	99.4%	100%	N/A	100%	99.9%	100%	N/A	100%
Mech. SP (acres)	N/A	N/A	N/A	N/A	100%	N/A	N/A	N/A	100%	100%	N/A	N/A
Chem. SP (acres)	100%	100%	N/A	N/A	100%	100%	N/A	N/A	100%	100%	N/A	N/A
Firebreaks (miles)	75.9%	N/A	N/A	67.9%	80.2%	27.0%	N/A	N/A	75.8%	N/A	N/A	N/A
Burning (acres)	99.9%	N/A	N/A	100%	99.8%	N/A	N/A	N/A	100%	N/A	N/A	N/A
Artif. Regen. (acres)	100%	100%	N/A	N/A	100%	100%	N/A	N/A	100%	100%	N/A	N/A
Fertilization (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Equip. Service	100%	100%	N/A	N/A	98.2%	97.8%	N/A	100%	98.2%	100%	N/A	100%
Overall acres	99.1%	98.9%	N/A	99.9%	99.4%	99.9%	N/A	99.9%	99.9%	99.9%	N/A	99.8%
Streams (miles)	79.4%	89.7%	N/A	N/A	93.0%	99.3%	N/A	100%	92.3%	99.4%	N/A	96.0%

Practice	LOWER COASTAL PLAIN				Subtotal				State Total:
	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public	
SMZs (acres)	84.9%	99.9%	99.8%	0%	92.2%	97.3%	99.8%	97.1%	94.2%
Stream Xings (#)	38.0%	72.7%	N/A	N/A	32.6%	70.7%	N/A	0%	44.0%
Forest Roads (miles)	94.7%	92.2%	85.1%	N/A	90.6%	95.1%	85.1%	98.1%	92.1%
Harvesting (acres)	99.7%	99.9%	100%	100%	99.7%	99.9%	100%	100%	99.8%
Mech. SP (acres)	100%	99.8%	100%	N/A	100%	99.9%	100%	N/A	99.9%
Chem. SP (acres)	N/A	99.9%	100%	N/A	100%	100%	100%	N/A	100%
Firebreaks (miles)	95.2%	96.1%	N/A	N/A	81.2%	55.5%	N/A	67.9%	78.9%
Burning (acres)	100%	N/A	N/A	N/A	99.9%	N/A	N/A	100%	99.9%
Artif. Regen. (acres)	100%	100%	100%	N/A	100%	100%	100%	N/A	100%
Fertilization (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Equip. Service	98.6%	99.3%	100%	100%	98.5%	99.1%	100%	100%	98.7%
Overall acres	99.4%	99.9%	N/A	98.8%	99.5%	99.9%	99.9%	99.8%	99.7%
Streams (miles)	92.6%	100%	99.4%	0%	89.8%	96.7%	99.5%	97.5%	92.0%

TABLE 14: % BMP Implementation by Practice, Region, and Ownership

Practice	Mountain				Piedmont				Upper Coastal Plain			
	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public
SMZs (acres)	79.6%	90.0%	N/A	66.7%	89.3%	97.6%	N/A	94.4%	90.3%	92.7%	N/A	80.0%
Stream Xings (#)	92.2%	97.7%	N/A	N/A	73.9%	91.4%	N/A	N/A	75.0%	85.7%	N/A	44.4%
Forest Roads (miles)	88.5%	98.2%	N/A	100%	85.8%	98.5%	N/A	88.9%	92.0%	98.9%	N/A	85.7%
Harvesting (acres)	97.7%	100%	N/A	N/A	93.3%	100%	N/A	100%	98.3%	100%	N/A	100%
Mech. SP (acres)	N/A	N/A	N/A	N/A	100%	N/A	N/A	N/A	100%	100%	N/A	N/A
Chem. SP (acres)	100%	100%	N/A	N/A	100%	100%	N/A	N/A	100%	100%	N/A	N/A
Firebreaks (miles)	61.9%	N/A	N/A	66.7%	54.8%	50.0%	N/A	N/A	73.9%	N/A	N/A	N/A
Burning (acres)	75.0%	N/A	N/A	100%	100%	N/A	N/A	N/A	100%	N/A	N/A	N/A
Artif. Regen. (acres)	100%	100%	N/A	N/A	100%	100%	N/A	N/A	100%	100%	N/A	N/A
Fertilization (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Equip. Service	100%	100%	N/A	N/A	98.1%	97.9%	N/A	100%	97.2%	100%	N/A	100%
Overall	90.2%	97.8%	N/A	82.6%	87.5%	96.9%	N/A	95.3%	92.5%	95.0%	N/A	77.8%

Practice	LOWER COASTAL PLAIN				Subtotal				State
	NIPF	FI	TIMO	Public	NIPF	FI	TIMO	Public	Total:
SMZs (acres)	85.9%	98.0%	84.6%	50.0%	87.7%	96.3%	84.6%	78.6%	89.2%
Stream Xings (#)	85.7%	95.8%	N/A	N/A	80.9%	93.4%	N/A	44.4%	84.3%
Forest Roads (miles)	93.4%	91.3%	96.0%	N/A	90.1%	95.2%	96.0%	90.9%	91.3%
Harvesting (acres)	99.2%	99.5%	100%	100%	96.7%	99.8%	100%	100%	97.4%
Mech. SP (acres)	100%	81.5%	100%	N/A	100%	84.8%	100%	N/A	94.3%
Chem. SP (acres)	100%	87.5%	100%	N/A	100%	95.5%	100%	N/A	97.9%
Firebreaks (miles)	78.1%	85.7%	N/A	N/A	67.4%	69.2%	N/A	66.7%	67.5%
Burning (acres)	100%	N/A	N/A	N/A	95.4%	N/A	N/A	100%	95.6%
Artif. Regen. (acres)	100%	100%	100%	N/A	100%	100%	100%	N/A	100%
Fertilization (acres)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Equip. Service	99.3%	99.0%	100%	100%	98.5%	99.0%	100%	100%	98.6%
Overall	92.4%	95.5%	94.8%	83.3%	90.6%	96.0%	94.8%	88.1%	91.8%

TABLE 15: Statewide Trends in BMP Compliance by Ownership and Practice

Practice	NIPF						Industry						Public					
	1991	92	98	02	04	07	1991	92	98	02	04	07	1991	92	98	02	04	07
SMZs (acres)	NA	NA	84.3	93.2	93.4	92.2	NA	NA	95.7	99.0	99.4	97.3	NA	NA	89	98.5	92.2	97.1
Stream Crossings (#)	NA	NA	8.2	30.5	29.8	32.6	NA	NA	51.0	57.5	78.6	70.7	NA	NA	9.0	29.7	82.4	0
Forest Roads (miles)	64	86	80.9	75.3	88.7	90.6	77	89	92	95.0	98.4	95.1	85	96	99.9	84.8	99.8	98.1
Harvesting (acres)	75	91	97.6	98.9	99.3	99.7	92	93	99.5	99.8	99.9	99.9	75	97	99.7	97.8	100	100
Mech. Site Prep. (ac)	93	95	99.6	99.6	100	100	95	98	100	99.9	100	99.9	97		100	100	100	N/A
Chem. Site Prep. (ac)	100		100	100	100	100	100		100	99.9	100	100				100	100	N/A
Firebreaks (miles)				83.6	95.6	81.2				58.6	96.9	55.5				94.9	76.5	67.9
Burning (acres)	92		93	99.1	99.9	99.9	76		94.6	100	100	N/A	99		100	100	96.7	100
Art. Regen. (ac)	96	100	99.7	95.6	99.3	100	96	100	99.8	100	100	100	98	100	100	100	100	N/A
Fertilization (acres)						N/A				100	100	N/A						N/A
Equip. Servicing						98.5						99.1						100
Overall acres	80.0	91.0	97.4	98.6	99.2	99.5	93.0	93.0	99.1	99.8	99.9	99.9	77.0	97.0	99.4	98.5	98.6	99.8
Streams (miles)	94.4	94.9	84.6	90.9	93.2	89.8	97.1	96.9	98.5	97.7	99.6	96.7	91.7	100	100	97.6	99.6	97.5
ALL																		
Practice	1991	92	98	02	04	07												
SMZs (acres)	N/A	N/A	89.3	96.6	96.3	94.2												
Stream Crossings (#)	N/A	N/A	18.2	38.1	44.1	44.0												
Forest Roads (miles)	69	87.4	87.7	84.3	93.4	92.1												
Harvesting (acres)	83.2	91.7	98.5	99.1	99.5	99.8												
Mech. Site Prep. (ac)	94.2	96.5	99.8	99.9	100	99.9												
Chem. Site Prep. (ac)	100	100	100	100	100	100												
Firebreaks (miles)				81.0	93.0	78.9												
Burning (acres)	84.6		94.0	99.7	98.4	99.9												
Art. Regen. (ac)	96	100	99.0	99.8	99.6	100												
Fertilization (acres)			100	100	100	N/A												
Equip. Servicing						98.7												
Overall acres	86	92	98.2	99.1	99.4	99.7												
Streams (miles)	95.8	95.5	90.7	94.2	95.9	92.0												

Georgia Statewide Trends in BMP Compliance by Practice

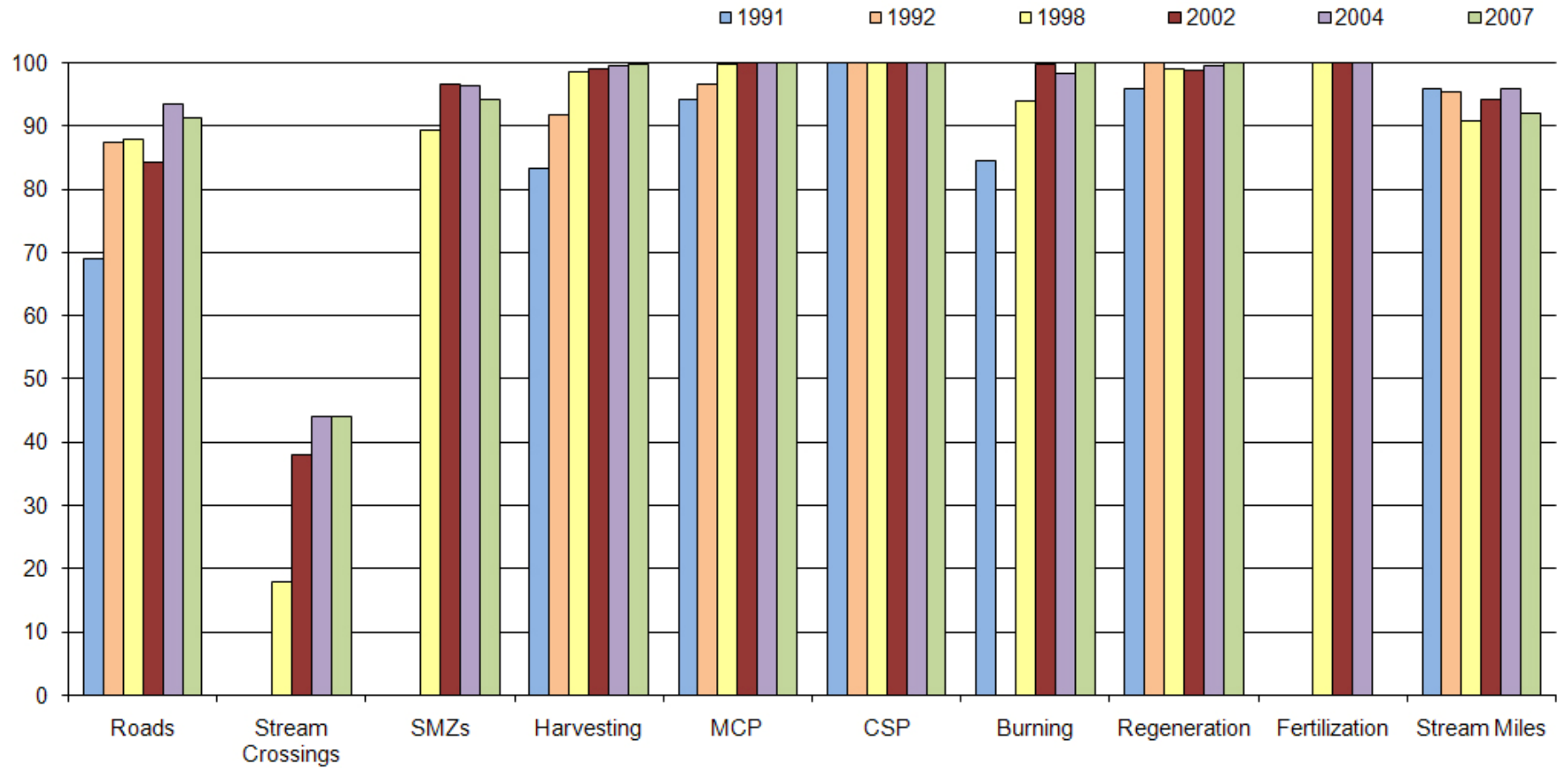


TABLE 16: Statewide Trends in BMP Implementation by Ownership and Practice

Practice	NIPF						Industry						Public					
	1991	92	98	02	04	07	1991	92	98	02	04	07	1991	92	98	02	04	07
SMZs	75.9	78	76.9	83.7	88.3	87.7	82.8	81	91.2	93.7	97.9	96.3	81.1	100	84.0	92.0	85.3	78.6
Stream Crossings	72.2	65	49.2	72.6	71.5	80.9	77.3	81	78.6	87.2	95.6	93.4	90.9	88	63.0	79.0	96.0	44.4
Forest Roads	40.8	58	74.0	81.4	83.7	90.1	61.7	68	81.0	85.9	96.1	95.2	77.5	75	94.0	80.5	98.5	90.9
Harvesting	46.2	53	86.3	90.5	93.0	96.7	59.8	60	90.5	94.0	97.9	99.8	70.7	91	88.0	91.7	99.0	100
Mech. Site Prep	65.7	87	95.7	96.2	100	100	66.4	86	98.0	93.6	98.9	84.8	54.5		100	100	100	N/A
Chem. Site Prep	100	100	98.8	100	100	100	100	100	100	96.4	100	95.5				100	100	N/A
Firebreaks				69.6	84.3	67.4				55.6	92.3	69.2				88.2	63.2	66.7
Burning	77.2	92	61.8	90.9	100	95.4	81.6	60	58.8	100	100	N/A	70.0		100	100	71.4	100
Art.Reg.	96.5	100	90.8	92.6	97.2	100	100		98.0	100	100	100	100		100	100	100	N/A
Fertilization						N/A				83.3	100	N/A						N/A
Equip. Srvng				93.3	94.9	98.5				97.1	99.3	99.0				94.3	94.9	100
Overall	61.4	63.0	75.4	83.8	86.6	90.6	72.0	71.0	86.3	90.7	97.2	96.0	78.8	86.0	84.0	86.9	92.2	88.1
ALL																		
Practice	1991	92	98	02	04	07												
SMZs	72.8	80	80.9	87.1	90.8	89.2												
Stream Crossings	74.7	71	58.8	77.4	80.6	84.3												
Forest Roads	53.4	62	76.6	82.7	88.8	91.3												
Harvesting	51.6	57	87.3	91.4	94.4	97.4												
Mech. Site Prep	65.6	89	96.8	94.6	99.1	94.3												
Chem. Site Prep	100	100	99.3	97.8	100	97.9												
Firebreaks				71.1	84.6	67.5												
Burning	78.4	77	61.5	94.4	92.6	95.6												
Art.Reg.	97.8	100	93.4	95.4	98.0	100												
Fertilization				83.3	100	N/A												
Equip. Srvng				94.4	96.1	98.6												
Overall	64.9	67.0	78.7	85.9	89.8	91.8												

Statewide Trends in BMP Implementation by Practice

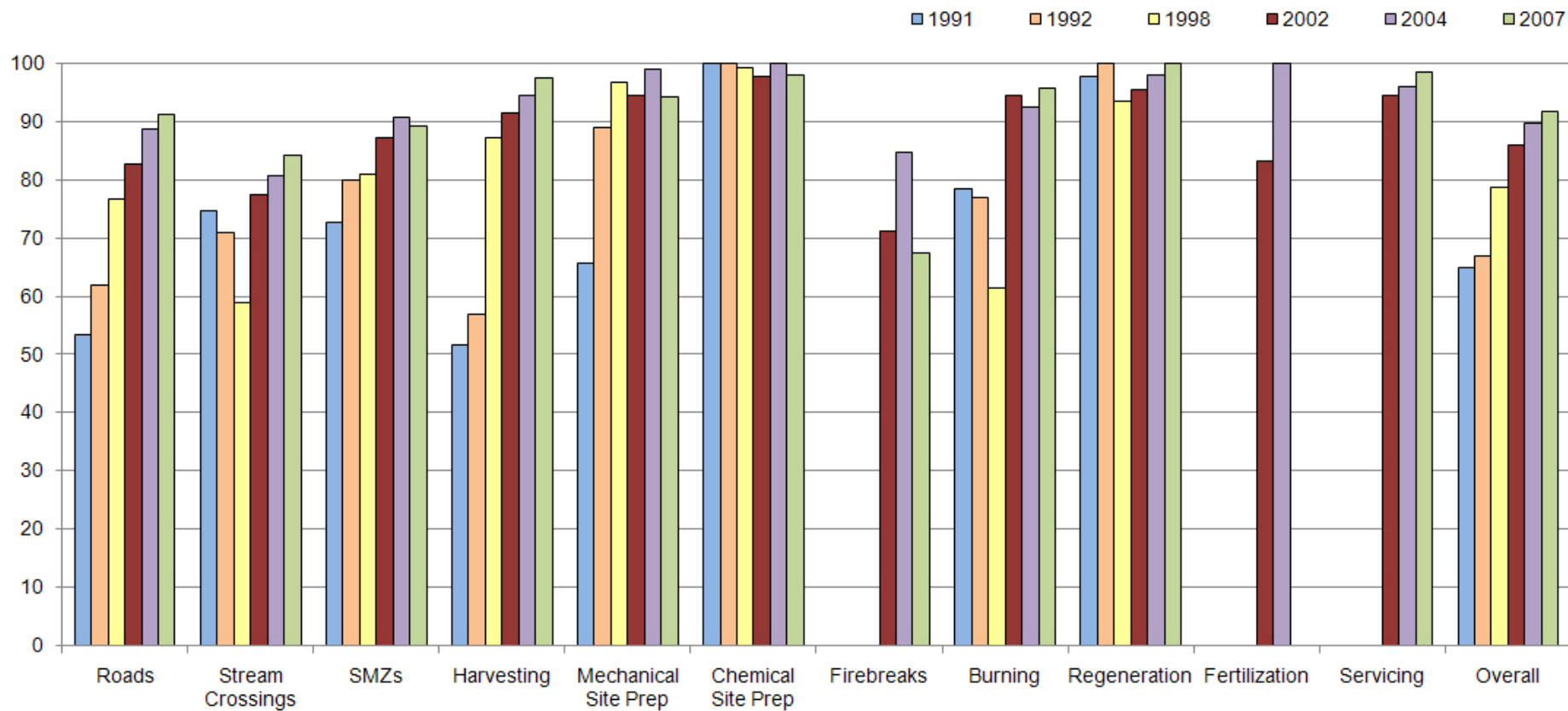
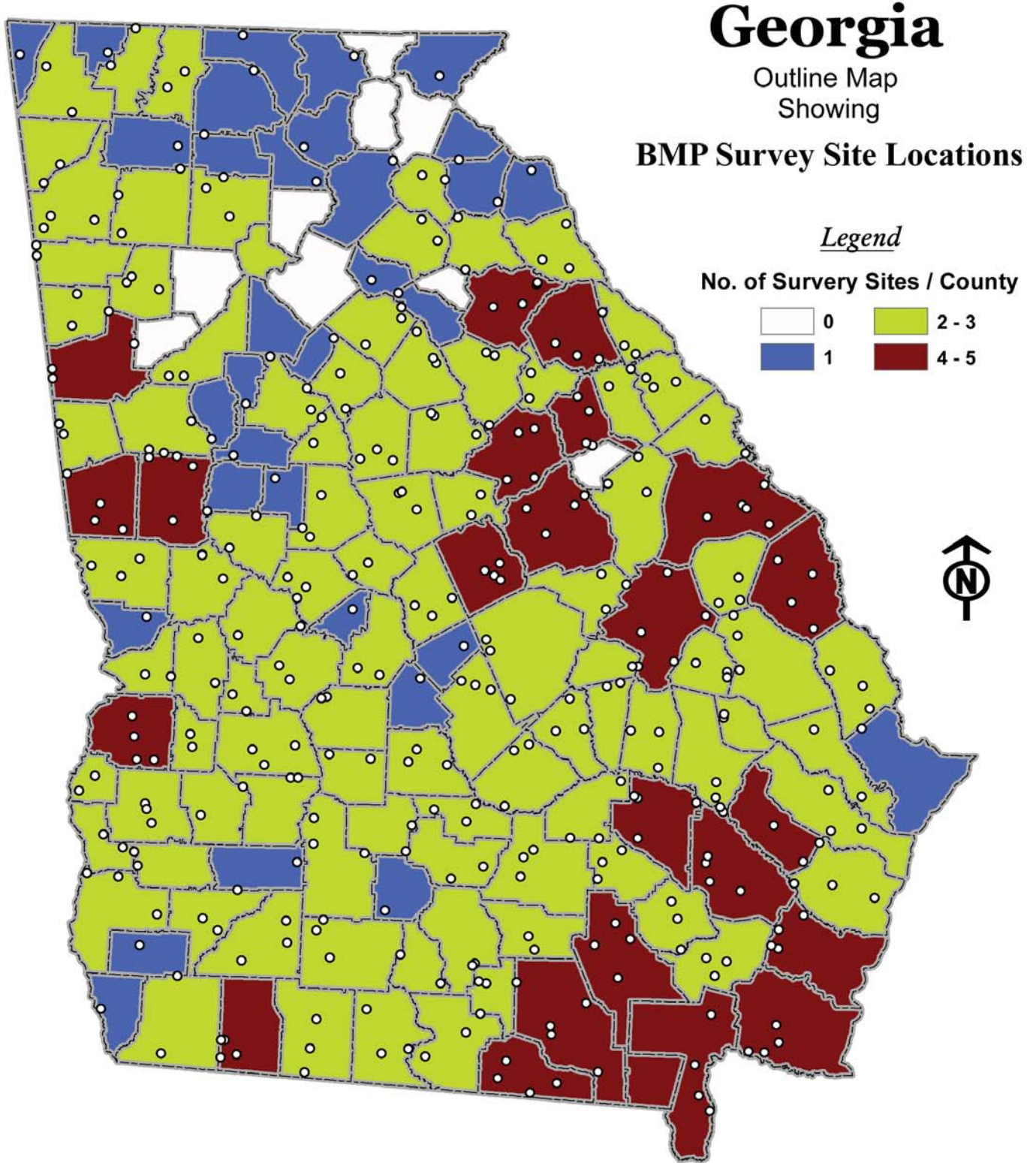


Figure 1 - 2007 Forestry BMP Survey

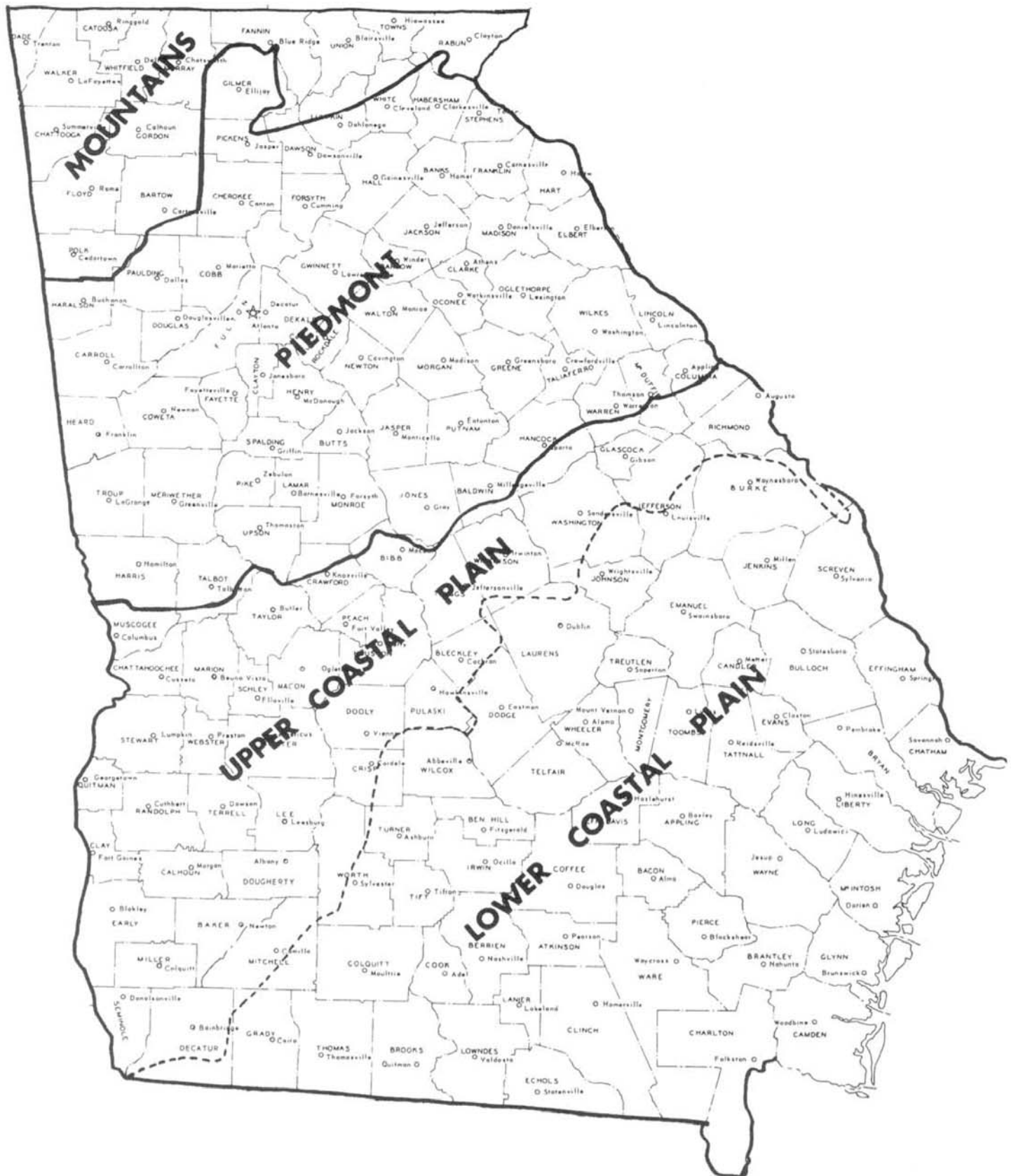


Disclaimer:

This map is for illustrative purposes and does not imply the expression of any opinion on the part of the BMP Survey, GFC, or the ownership concerning the location of any survey sites or concerning the delimitation of its frontiers or boundaries.

Source: Georgia Forestry Commission
Produced By: Constance Buford, GIS Coordinator
Date: October 17, 2008

Figure 2 - Physiographic Regions of Georgia



Georgia Forestry Commission
Best Management Practices
2007 Implementation and Compliance Survey Form

SECTION 1. LANDOWNER INFORMATION

1. Ownership Type: (NIPF, Forest Industry, Corporate((includes TIMOs)), Public): _____
2. Landowner Name and Address: _____
3. District No. ___ County: _____ UTM Coordinates: Zone ___ E _____, N _____.
4. If NIPF, technical / professional forestry assistance was provided by (check all that apply): ___ N/A
___ Forestry Consultant; _____ Company Name; ___ ACF member? (yes or no)
___ Industry (Map, LAP) Forester; _____ Company Name; ___ Registered? (yes or no)
___ GFC Forester; _____ Name; ___ Registered? (yes or no)
___ Extension forester; _____ Name; ___ Registered? (yes or no)
___ None received
5. Was a written contract used? ___ Yes; ___ No; ___ Not Sure
6. If yes, were BMPs specified in contract? ___ Yes; ___ No
7. Was a written plan used? ___ Yes; ___ No; ___ Not Sure

SECTION 2. WATERSHED CHARACTERISTICS

1. Physiographic Region: _____ Ecoregion #: _____
2. Topo Quad Name: _____ NRCS Soil Map #: _____
3. Major River Basin: _____
4. 12 digit HUC: _____
5. Dominant Terrain: ___ flat; ___ rolling; ___ steep
6. Dominant soil erodibility hazard rating (from soil survey) ___ slight; ___ moderate; ___ severe
7. Hydric soil limitations for equipment (from soil survey) ___ NA; ___ slight; ___ moderate; ___ severe
8. Type waterbodies found within SMZs of this practice (#): ___ none; ___ perennial stream; ___ intermittent stream;
___ pond or lake;
9. Are any of the streams considered trout streams? ___ N/A; ___ Yes; ___ No
10. Name of stream or tributary of: _____
11. Miles of stream within SMZs of this practice: _____ Intermittent; _____ Perennial
12. Does the practice occur w/in any of the following protected areas? ___ N/A ___ Mountain Top; ___ Water Supply
Reservoir/Watershed; ___ River Corridor;
13. Does any portion of the practice occur w/in a biota, sediment, or dissolved oxygen impaired watershed? ___ Yes; ___ No
14. If yes, is the stream (watershed) listed for a TMDL reduction? ___ Yes; ___ No

SECTION 3. FOREST TREATMENTS: Check all that apply

1. Timber Harvest Type: ___ N/A; ___ clearcut; ___ select cut; ___ thinning; ___ regen. cut; ___ salvage; ___ land use conversion
 A. Buyer Name: _____; MTH? ___ yes; ___ no
 B. Logger Name: _____; MTH? ___ yes; ___ no
 C. Receiving Mill(s): _____
2. Forest Roads (from intersection of improved road through practice area): ___ N/A; ___ pre-existing; ___ new; ___ both
 A. Contractor Name: _____
3. Stream Crossings: ___ N/A; ___ pre-existing; ___ new; ___ both
4. Mechanical Site Preparation: ___ N/A; ___ yes
 A. Contractor Name: _____
5. Chemical Site Preparation: ___ N/A; ___ yes
 A. Contractor Name: _____
6. Regeneration Type: ___ N/A; ___ machine; ___ hand; ___ both
 A. Contractor Name: _____
7. Burning including pre-suppression or wildfire firebreaks: ___ N/A; ___ yes
 A. Breaks plowed by: ___ GFC; ___ owner; ___ other
8. Forest Fertilization: ___ N/A; ___ yes
 A. Contractor Name: _____

Approximate acreage of treated area including SMZs: _____

SECTION 4: FOREST ROADS OUTSIDE SMZs NA **If NA, go to Section 5.**

Assessment of Pre-existing Roads:

1. Can existing roads with the potential for water quality impacts be corrected with BMPs? NA Yes No WQR

Location of New Roads:

2. The number, length, and width of new roads are minimized? NA Yes No WQR
3. On rolling or steep terrain, new roads are located on sides of ridges? NA Yes No WQR
4. On rolling or steep terrain, new roads are located on southern or western sides of ridges? NA Yes No WQR
5. New permanent roads on rolling or steep terrain generally follow the contour with grades kept at $\leq 10\%$? NA Yes No WQR
6. New temporary roads on rolling or steep terrain generally follow the contour with grades kept at $\leq 25\%$? NA Yes No WQR

Construction and Maintenance of New and Pre-existing Roads:

7. Points of ingress from county roads or highways are maintained to prevent mud and debris onto these roads? NA Yes No WQR

8. On rolling or steep terrain, roads are well drained by the use of adequately installed (# and spacing) water diversion measures? NA Yes No WQR
9. On flat terrain, roads are properly constructed to ensure adequate surface drainage, ie. crown and ditch. NA Yes No WQR
10. Where surface drainage is a problem, the road has been day lighted for maximum sunlight exposure? NA Yes No WQR
11. Rutting of roads has been avoided? NA Yes No WQR
12. Water diversion measures with turnouts are adequately installed prior to SMZs? NA Yes No WQR
13. If necessary, outfalls of turnouts or cross-drain culverts are adequately stabilized? NA Yes No WQR
14. Disregarding stream crossings, critical upland road segments are stabilized? NA Yes No WQR
15. Side ditches are kept free from obstructions and logging debris? NA Yes No WQR

Retirement of New and Pre-existing Roads:

16. Permanent roads have been adequately reshaped and stabilized? NA Yes No WQR
17. Temporary roads have been adequately retired? NA Yes No WQR

FOREST ROAD TOTALS: Yes: ___ No: ___ WQR: ___

Road BMP Implementation %: _____

Pre-existing miles: _____ Pre-existing miles in compliance: _____ Percent pre-existing miles in compliance: _____%

New miles: _____ New miles in compliance: _____ Percent New miles in compliance: _____%

SECTION 5: STREAM AND WETLAND CROSSINGS NA **If NA, go to Section 6**

1. The number of permanent roads, temporary access roads, and skid trails crossings streams is minimized. NA Yes No WQR
2. Borrow material for stream crossings or wetland fill roads is taken from upland sources where feasible? NA Yes No WQR
3. Discharges of dredged or fill material into streams or wetlands to construct a fill road minimize the encroachment of heavy equipment? NA Yes No WQR
4. In designing, constructing, and maintaining roads, vegetative disturbances are kept to a minimum? NA Yes No WQR
5. Discharges of fill material into streams or wetlands avoid taking or jeopardizing the continued existence of a threatened or endangered species or adversely modify or destroy the habitat of such species? NA Yes No WQR
6. Discharges of fill material into breeding and nesting areas for waterfowl, spawning areas, and wetlands are avoided unless no other alternative exists? NA Yes No WQR
7. Avoided discharges of fill material in the proximity of a public water supply intake? NA Yes No WQR
8. Avoided discharges of fill material in areas of concentrated shellfish production? NA Yes No WQR
9. Avoided discharges of fill material in a component of the National Wild and Scenic River System? NA Yes No WQR
10. Avoided discharges of fill material containing toxic pollutants? NA Yes No WQR
11. Permanent stream crossings and wetland fill roads are bridged, culverted, or designed to prevent the restriction of expected 25-year storm flow events? NA Yes No WQR
12. The design, construction, and maintenance of the crossing avoids disrupting the migration or other movement of those species of aquatic life inhabiting the water body? NA Yes No WQR
13. Approaches to streams are at right angles where practical? NA Yes No WQR
14. Approaches to all crossings at $\leq 3\%$ grade wherever possible? NA Yes No WQR
15. Approaches have surface water control structures on both sides of crossings? NA Yes No WQR
16. Approaches are stabilized, where necessary with rock, logging slash, or seed & mulch, etc) extending out 50 ft from both sides of stream bank? NA Yes No WQR
17. Main haul road fords are located where stream is shallow, streambeds are relatively hard and level, and banks are low and stable? NA Yes No WQR
18. Culverted crossings are located in straight sections of the stream? NA Yes No WQR
19. At least 15 inches or 1/3 the culvert's diameter of fill dirt is packed over the culvert? NA Yes No WQR
20. Fill over culvert ends meets a 2:1 slope or is otherwise adequately stabilized? NA Yes No WQR
21. Combination of smaller culvert with rock surfaced dips properly constructed? NA Yes No WQR
22. Exposed soil in shoulders of wetland fill roads and at stream crossings, properly stabilized? NA Yes No WQR
23. Fords for skidder crossings have been avoided? NA Yes No WQR

24. All temporary crossings and associated fills are removed in their entirety and the area is restored to its original elevation?

NA Yes No WQR

STREAM CROSSING TOTALS: Yes: ___ No: ___ WQR: ___

STREAM CROSSING BMP Implementation %: _____

Main access road fords:	Pre-existing: _____	in compliance: _____	percent in compliance: _____%
	New: _____	in compliance: _____	percent in compliance: _____%
	Total: _____	in compliance: _____	percent in compliance: _____%
Permanent culverts:	Pre-existing: _____	in compliance: _____	percent in compliance: _____%
	New: _____	in compliance: _____	percent in compliance: _____%
	Total: _____	in compliance: _____	percent in compliance: _____%
Temporary culverts:	Pre-existing: _____	in compliance: _____	percent in compliance: _____%
	New: _____	in compliance: _____	percent in compliance: _____%
	Total: _____	in compliance: _____	percent in compliance: _____%
Bridges:	Pre-existing: _____	in compliance: _____	percent in compliance: _____%
	New: _____	in compliance: _____	percent in compliance: _____%
	Total: _____	in compliance: _____	percent in compliance: _____%
Skidder fords:	Pre-existing: _____		
	New: _____		
	Total: _____		
Debris:	Pre-existing: _____		
	New: _____		
	Total: _____		
Grand Total:	Pre-existing: _____	in compliance: _____	percent in compliance: _____%
	New: _____	in compliance: _____	percent in compliance: _____%
	Grand Total: _____	in compliance: _____	percent in compliance: _____%

SECTION 6. STREAMSIDE MANAGEMENT ZONES (SMZS) NA If NA, Go To Section 7

- | | |
|--|---|
| 1. Appropriate SMZ widths established and maintained along all applicable streams within the practice area? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 2. Recommended number of residual BA or canopy cover trees left in SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 3. Other than forest health issues, streambank trees left un-harvested? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 4. Harvesting w/in SMZs caused minimal soil disturbance? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 5. Logging debris kept out of stream channels? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 6. De-limbing gates or trees used as de-limbing gates have been avoided w/in SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 7. Except at planned stream crossings, new access roads located outside of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 8. Except at planned stream crossings, pre-existing or new roads w/in SMZs maintained with adequate water control structures and stabilization measures? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 9. Water control structures in roads direct surface flows into adequate filter zones above streams or waterbodies? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 10. Skid trails, log decks, and staging areas are located outside of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| A. If No, are they stabilized? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 11. Mechanical site preparation kept out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| A. If No, windrows or debris piles have been kept out of stream channels? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 12. Windrows or planting beds avoid tying directly into stream channels? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 13. Site preparation burns kept out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 14. Pre-suppression firebreaks installed out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 15. Intensity of prescribed fire minimized within SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 16. Firebreaks tied into streams have been done by backblading? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 17. Firebreaks tied into streams have adequate water control structures in place at SMZ margins? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 18. Mechanical tree planting kept out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 19. The handling, mixing, loading and broadcast application of pesticides or fertilizers kept out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |
| 20. Equipment serviced out of SMZs? | NA <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> WQR <input type="checkbox"/> |

SMZ BMP TOTALS: Yes: ___ No: ___ WQR: ___

SMZ BMP IMPLEMENTATION %: ___

Acres: _____ Acres in compliance: _____ Percent Acres in compliance: _____%

SECTION 7: SPECIAL MANAGEMENT AREAS

NA If NA, Go to Section 8

Do any of the following occur within the practice area? canals ditches; ephemeral areas; gullies; seeps or springs; sinkhole; floodplain features; wetlands

Canals/Ditches:

- 1. Logging and site prep debris kept out of canals and ditches? NA Yes No WQR
- 2. Crossings of canals and ditches minimized? NA Yes No WQR
- 3. Canal/Ditch culvert crossings stabilized? NA Yes No WQR
- 4. Application of Non-Aquatic-Labeled herbicides avoided in canals/ditches with flowing or standing water? NA Yes No WQR
- 5. Firebreaks tied into canals/ditches have been done by backblading, with appropriate structures at margins? NA Yes No WQR
- 6. Planting beds, windrows, avoid channeling runoff into canals and ditches? NA Yes No WQR

Ephemeral Areas/Gullies/Riverine Floodplains:

Ephemeral/Gully/Floodplain Decision Tree;

- A. Does the Headwater Feature have a defined channel? If Yes, go to next question, No go to Question E.
- B. Does the channel show evidence of water pools, fluctuating watermarks, streambed scouring, AND sinuous form? Yes, answer questions for this feature under Streamside Mgmt Zones (Sect. 6), No, go to next question.
- C. What is water flow duration following rain event? If for short time period after rain, Go to Question 7-10 for Ephemeral areas. If flow duration is only immediately after the rain, go to next question.
- D. Does channel connect to stream or other water body, and watershed larger than 0.2 ac? Yes, go to Questions 11-19 for Gullies. If No, no further concern.
- E. Does the area/feature exhibit wetland characteristics? Yes, go to Questions 20-33 for Floodplain Feature BMPs. If No, go to Questions 7-10 for Ephemeral Areas.

Ephemeral Areas:

- 7. Soil and litter layer disturbance kept to a minimum? NA Yes No WQR
 - A. If No, have exposed soils been stabilized with logging debris, grass or mulch? NA Yes No WQR
- 8. High intensity fire avoided? NA Yes No WQR
- 9. Debris mats, dragline mats, or other soil protecting structures do **not** interfere with natural water flow? NA Yes No WQR
- 10. Roads, firebreaks, turnouts/outfalls avoid tying into ephemeral areas? NA Yes No WQR

Gullies:

- 11. Stringer trees left on banks as marker for subsequent forestry activities and to hold/stabilize banks? NA Yes No WQR
- 12. Soil and litter layer disturbance minimized through use of low impact harvesting and site prep methods? NA Yes No WQR
- 13. High intensity fire avoided? NA Yes No WQR
- 14. Logging debris/slash placed in gullies does not impound water? NA Yes No WQR
- 15. Roads, firebreaks, and turnouts/outfalls avoid tying into gullies? NA Yes No WQR
- 16. Firebreaks crossing gullies done by backblading away from gully with waterbar/turnout at approaches? NA Yes No WQR
- 17. Equipment encroachment minimized? NA Yes No WQR

18. Log decks located away from gullies? NA Yes No WQR
19. Forestry activities avoid reactivating gullies? NA Yes No WQR

Riverine Floodplains:

Intermittent Floodplain Features (less defined channel, mixed substrate)

FOR... *Seeps *Continuous side channels *Braided channels

20. All banks trees left? NA Yes No WQR
21. 50% Canopy cover left within banks? NA Yes No WQR
22. Feature and banks have been protected? NA Yes No WQR
23. 20 ft. zones maintained with no mechanical site prep? NA Yes No WQR
24. Application of Non-Aquatic herbicides, fertilizers, and all controlled burns avoided within 20 ft. of defined banks? NA Yes No WQR

Ephemeral Floodplain Features (well to no defined channel, mixed substrate, occasional evidence of scour/debris movement)

FOR... *Floodways *River bottom flats

25. Application of Non-Aquatic herbicides, fertilizers, and all controlled burns avoided? NA Yes No WQR

FOR... *Discontinuous Side Channels *Backwater Paleo Channels

26. All bank trees left along clearly defined banks? NA Yes No WQR
27. Feature and banks protected? NA Yes No WQR
28. 20-ft zones maintained along defined banks where no mech. site prep has occurred? NA Yes No WQR
29. Application of Non-Aquatic herbicides, fertilizers, and all controlled burns avoided within 20 ft. of defined banks? NA Yes No WQR

Ponded Features(usually no channel, wetland vegetation and soils, organic and fine substrate)

FOR... *Backwater Swamps *Isolated Depressions *Oxbows/Ponds

30. Stringer trees left to define banks where they are apparent? NA Yes No WQR
31. Feature and banks protected? NA Yes No WQR
32. 20-ft zones maintained along defined banks where no mech. site prep has occurred? NA Yes No WQR
33. Application of Non-Aquatic herbicides, fertilizers, and all controlled burns avoided within 20 ft. of defined banks? NA Yes No WQR

SMA TOTALS: Yes: ___ No: ___ WQR: ___

SMA BMP IMPLEMENTATION %: ___

SECTION 8: TIMBER HARVESTING OUTSIDE SMZs NA If NA, Go To Section 9

Log Decks:

1. The number of log decks is minimized? NA Yes No WQR
2. The size of log decks is minimized? NA Yes No WQR
3. Log decks are located on stable, well-drained areas where possible? NA Yes No WQR
4. Log decks avoid concentrating storm runoff onto roads, trails, or

direct paths leading to a watercourse?

NA Yes No WQR

5. Log decks are retired and stabilized with appropriate measures as needed?

NA Yes No WQR

Skid Trails:

6. On rolling or steep terrain, skid trails converge with log decks on top of hills or ridges instead of bottom of hills?

NA Yes No WQR

7. On steep terrain, trails are avoided on > 40% grade?

NA Yes No WQR

8. On rolling or steep terrain, skid trails are retired and stabilized with appropriate water diversion measures or slash dispersal?

NA Yes No WQR

9. On wetland or saturated soils, rutting has been minimized?

NA Yes No WQR

10. On wetland sites, the harvest was conducted during the dry season when possible?

NA Yes No WQR

TIMBER HARVESTING TOTALS: Yes: ___ No: ___ WQR: ___

TIMBER HARVESTING BMP IMPLEMENTATION %: _____

Log Decks: _____ # Log Decks in compliance: _____

Percent Log Decks in compliance: _____%

Main Skid Trails: _____ # Main Skid Trails in compliance: _____

Percent Skid Trails in compliance: _____%

Acres: _____ Acres in compliance: _____

Percent Acres in compliance: _____%

SECTION 9: MECHANICAL SITE PREPARATION OUTSIDE SMZS NA **If NA, Go To Section 10**

1. On slopes between 0 - 5%, methods are appropriate for the site.

NA Yes No WQR

2. On slopes between 6 - 20%, intensive methods (disking and bedding) follow the contour?

NA Yes No WQR

3. On slopes between 11 - 20%, with soils having a moderate to severe erosion hazard, strips of untreated areas or windrows are left on contour?

NA Yes No WQR

4. On slopes between 21 and 30%, with severe erosion hazards, only low intensity methods (chopping) are used?

NA Yes No WQR

5. On slopes > 31%, only drum roller chopping is conducted?

NA Yes No WQR

6. Bedding avoids directing surface runoff into roadbeds or road ditches?

NA Yes No WQR

7. On jurisdictional wetland sites, mechanical methods minimize soil disturbance?

NA Yes No WQR

8. On jurisdictional wetland sites, major ditching has been avoided?

NA Yes No WQR

9. Mechanical site preparation for pine establishment has been avoided in wetlands described in the November 1995 EPA/COE memorandum?

NA Yes No WQR

MECHANICAL SITE PREP. TOTALS: Yes: ___ No: ___ WQR: ___

MECHANICAL SITE PREP. BMP IMPLEMENTATION %: _____

Acres: _____ Acres in compliance: _____ Percent Acres in compliance: _____%

SECTION 10: CHEMICAL SITE PREPARATION OUTSIDE SMZs

NA **If NA, Go To Section 11**

- 1. It appears that all State and Federal laws regarding the storage, transportation, handling, application, and disposal of all chemicals and containers are followed? NA Yes No WQR
- 2. It appears that chemical drift into sensitive areas has been avoided? NA Yes No WQR

CHEMICAL SITE PREP. TOTALS: Yes: ___ No: ___ WQR: ___

CHEMICAL SITE PREP. IMPLEMENTATION %: _____

Acres: _____ Acres in compliance: _____ Percent Acres in compliance: _____%

SECTION 11: FIREBREAKS

NA **If NA, Go To Section 12**

Pre-Suppression Firebreaks:

- 1. Bladed or harrowed breaks are used whenever possible? NA Yes No WQR
- 2. Natural barriers such as roads, streams, and fields are used to minimize soil disturbance? NA Yes No WQR
- 3. Firebreaks are back bladed away from the edge of roads or road ditches? NA Yes No WQR
- 4. Water bars or turnouts are used at approaches to roads or road ditches? NA Yes No WQR
- 5. On rolling or steep terrain, pre-suppression firebreaks are installed on the contour as much as possible? NA Yes No WQR
- 6. On slopes > 3%, water bars or turnouts are properly constructed according to design and spacing? NA Yes No WQR
- 7. Old field terraces have not been purged by firebreaks? NA Yes No WQR

Wildfires:

- 8. Camps and staging areas are located on upland or well drained areas? NA Yes No WQR
- 9. Fire retardants are handled and mixed away from roadside ditches? NA Yes No WQR
- 10. Wildfire breaks have been repaired, as needed, with appropriate water diversion measures? NA Yes No WQR
- 11. Camps and staging areas are stabilized as necessary after fire is out? NA Yes No WQR

FIREBREAK TOTALS: Yes: ___ No: ___ WQR: ___

FIREBREAK BMP IMPLEMENTATION %: _____

Miles of pre-suppression firebreaks: _____ in compliance: _____ Percent in compliance: _____%

Miles of wildfire firebreaks: _____ In compliance: _____ Percent in compliance: _____%

SECTION 12: PRESCRIBED BURNING

NA **If NA, Go To Section 13**

- 1. Disregarding wildfires, soil exposure has been minimized? NA Yes No WQR

BURNING IMPLEMENTATION: %Yes: _____

Burned acres: _____ in compliance: _____ Percent in compliance: _____%

SECTION 13: ARTIFICIAL REGENERATION OUTSIDE SMZs

NA **If NA, Go To Section 14**

- 1. On slopes between 0 -5%, methods are appropriate for the site? NA Yes No WQR
- 2. On slopes between 5% and 20%, machine planting is on the contour? NA Yes No WQR
- 3. On slopes > 21%, hand planting is conducted? NA Yes No WQR
- 4. Pine establishment has been avoided on wetlands identified in the November 1995 EPA/COE memorandum? NA Yes No WQR

ARTIFICIAL REGENERATION TOTALS: Yes: ___ No: ___ WQR: ___

ARTIFICIAL REGENERATION BMP IMPLEMENTATION %: _____

Acres: _____ Acres in compliance: _____ Percent Acres in compliance: _____%

SECTION 14: FOREST FERTILIZATION OUTSIDE SMZs

NA **If NA, Go To Section 15**

- 1. Handling, mixing, loading, and application has been conducted away from roadside ditches? NA Yes No WQR
- 2. Fertilizer excess and containers have been disposed of properly? NA Yes No WQR

FERTILAZATION TOTALS: Yes: ___ No: ___ WQR: ___

FERTILIZATION IMPLEMENTATION %: _____

Acres: _____ Acres in compliance: _____ Percent Acres in compliance: _____%

SECTION 15: EQUIPMENT SERVICING and TRASH CLEAN-UP

NA **If NA, Go To Section 16**

- 1. Equipment serviced away from areas, including ephemeral areas, which may create a water quality problem? NA Yes No WQR
- 2. Oils, lubricants, and containers disposed of properly? NA Yes No WQR
- 3. All trash, tires, batteries associated with the operation is removed or disposed of properly? NA Yes No WQR

SERVICING and TRASH CLEAN-UP TOTALS: Yes: ___ No: ___ WQR: ___

SERVICING and TRASH CLEAN-UP IMPLEMENTATION %: _____

Landings (service Areas): _____ # Areas in Compliance: _____ Percent Areas in compliance: _____

SECTION 16: STREAM ASSESSMENT

NA If NA, Go To Section 17

1. Intermittent stream miles in BMP compliance: _____
2. Perennial stream miles in BMP compliance: _____

SECTION 17: OVERALL BMP IMPLEMENTATION SUMMARY

1. FOREST ROADS:	___ YES;	___ NO;	___ WQR
2. STREAM CROSSINGS:	___ YES;	___ NO;	___ WQR
3. STREAMSIDE MANAGEMENT ZONES:	___ YES;	___ NO;	___ WQR
4. SPECIAL MANAGEMENT AREAS:	___ YES;	___ NO;	___ WQR
5. TIMBER HARVESTING:	___ YES;	___ NO;	___ WQR
6. MECHANICAL SITE PREPARATION:	___ YES;	___ NO;	___ WQR
7. CHEMICAL SITE PREPARATION:	___ YES;	___ NO;	___ WQR
8. FIREBREAKS:	___ YES;	___ NO;	___ WQR
9. BURNING:	___ YES;	___ NO;	___ WQR
10. ARTIFICIAL REGENERATION:	___ YES;	___ NO;	___ WQR
11. FOREST FERTILIZATION:	___ YES;	___ NO;	___ WQR
12. EQUIPMENT SERVICING AND TRASH:	___ YES;	___ NO;	___ WQR
TOTALS:	___ YES;	___ NO;	___ WQR
OVERALL IMPLEMENTATION %:	___ YES		

SECTION 18: OVERALL BMP COMPLIANCE SUMMARY

	<u>Total Units</u>	<u>Units in Compliance</u>	<u>% Compliance</u>
1. FOREST ROADS (miles):			
• Pre-existing:	_____	_____	___
• Newly constructed:	_____	_____	___
• Total	_____	_____	___
2. STREAM CROSSINGS (#):			
• Pre-existing:	_____	_____	___
• Newly Constructed:	_____	_____	___
• Total	_____	_____	___
3. SMZs (acres):	_____	_____	___
4. SPECIAL MANAGEMENT AREAS: (N/A)			
5. TIMBER HARVESTING:			
• Log Decks (#):	_____	_____	___
• Skid Trails (#):	_____	_____	___
• Harvested Acres:	_____	_____	___
6. MECHANICAL SITE PREP. (acres):	_____	_____	___
7. CHEMICAL SITE PREP. (acres):	_____	_____	___
8. FIREBREAKS:			
• Pre-suppression Firebreak (miles)	_____	_____	___

• Wildfire Firebreak (miles)	_____	_____	_____
• Total (miles)	_____	_____	_____
9. BURNING: (acres)	_____	_____	_____
10. ARTIFICIAL REGENERATION (acres):	_____	_____	_____
11. FOREST FERTILIZATION (acres):	_____	_____	_____
12. EQUIPMENT SERVICING (# areas) :	_____	_____	_____
13. STREAM MILES:			
• Intermittent (miles)	_____	_____	_____
• Perennial (miles)	_____	_____	_____
• Total	_____	_____	_____

Survey Completed by: _____
Date Survey Completed: _____

GEORGIA FORESTRY
COMMISSION



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