



## **Working Forests in the United States**

Private forestry operations are regulated by a complex set of laws, regulations, and non-regulatory policies at the federal, state and local level. Despite varying between jurisdictions, the resulting framework has been effective in improving the environmental performance of forestry operations, and can be expected to do so in the future.

Working forests provide significant environmental benefits in addition to useful forest products, jobs, and economic activity. Watershed protection, wildlife habitat, carbon dioxide absorption, and other “environmental services” are currently provided by private landowners at little or no cost to society. America’s private working forests provide important benefits to water quality. Fifty-three percent of freshwater originates on forested land, where trees help the soil filter impurities from the water. That is why planting trees alongside water bodies is a time-tested conservation measure to protect water quality. Forest management is a long term land use that is far less intensive with respect to use of water, fertilizer, and chemicals than other land uses and complies with state forestry Best Management Practices (BMPs) that are highly effective at protecting water quality.

Today the greatest threat of deforestation comes from the conversion of forests to non-forest uses that produce a higher economic value. The families, businesses and individuals that own nearly 60% of our nation’s forests depend on the returns they get from the products their forests produce to make additional investments in sound, long-term forest management. When existing markets for their products are strong, or when new markets emerge, they provide forest owners the means to keep their land forested by keeping their forests economically competitive with other uses. However, when regulatory costs are imposed, this reduces the ability to maintain the land as forested and at some point will tip the balance in favor of the non-forest use.

### **Background**

The Clean Water Act<sup>1</sup> is arguably one of the federal laws of predominant relevance and application to working forests. Because forestry operations generally involve the use of access roads, the removal and regeneration of trees and associated ground disturbance, stream crossings, stormwater management, and herbicide applications, most of the environmental concerns related to forestry operations involve the protection of water quality.

Under the Clean Water Act, industrial facilities and wastewater treatment plants that discharge pollutants at known outfalls, or “point sources,” which can be directly monitored, are regulated with a federal permit system– the National Pollution Discharge Elimination System (NPDES). Conversely, “nonpoint sources” such as runoff from forests and farms, cannot be so easily monitored, measured or regulated, and Congress left regulation of these activities under state authority.

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<sup>1</sup> The Federal Water Pollution Control Act of 1972 (Public Law 92-500), as amended.

Forestry activities generally involve numerous relatively small operations occurring sporadically over large amounts of space and long periods of time, often by different landowners operating independently of one another. Complicating the situation is the fact that different forests, even those in close proximity with one another, may have vastly different characteristics in terms of topography, tree species, soil types, wildlife habitat, geology and hydrology. Consequently, the approach to protecting the environment from forestry activities must be adapted to local conditions and circumstances. Section 208 of the Clean Water Act, later supplemented by section 318, directed states to develop watershed or regional water quality management plans to identify significant nonpoint sources and assess their cumulative effects, and to “set forth procedures and methods (including land use requirements) to control to the extent feasible such sources.”<sup>2</sup>

With regard to forestry, EPA spoke clearly and reasonably in 1976 when it declared that forestry activities are in the nonpoint source category, except for four specific point sources related to certain facilities associated with forest management materials and products.<sup>3</sup> EPA also recognized “that numerous forest practices acts, State environmental programs, and local ordinances are excellent sources of effective regulation and ... such State and local expertise is the critical factor in the development of the 208 areawide plans for water pollution ... [T]he 208 process incorporating BMPs should effectively prevent and abate water pollution from silvicultural activities.”<sup>4</sup>

Forestry BMPs have been highly successful in controlling nonpoint source pollution from forest operations. National Water Quality Inventories conducted by the Environmental Protection Agency now contend that urban runoff, storm sewer discharges, and pollutants deposited from the atmosphere are more significant contributors of runoff than forestry activities.<sup>5</sup>

**1. The forestry community has developed a comprehensive framework for protecting water quality. Variation among state programs allows for states to tailor to individual state needs while providing opportunities to learn from each unique experience.**

Forestry activities in the United States are now conducted under the most comprehensive program of best management practices (BMPs) of any land use activity. Since the enactment of the Federal Water Pollution Control Act Amendments of 1972, all states with significant forest

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<sup>2</sup> Section 208(2)(F)(ii) of the Federal Water Pollution Control Act of 1972. In the 1987 amendment of the Clean Water Act, Congress added section 319, requiring states to develop plans for any nonpoint source activities that were causing state waters to fall short of water quality goals. Taken together, sections 218 and 319 authorize States to obtain federal funding to manage nonpoint source pollution, with oversight by EPA.

<sup>3</sup> 40 C.F.R. § 122.27.

<sup>4</sup> 41 Fed. Reg. 24709, 24710 (June 18, 1976). EPA re-affirmed its 1976 conclusion regarding the absence of a need for NPDES permits for forest management when it excluded these activities from the stormwater program in 1990, 40 C.F.R. § 122.26(b)(14) and 55 Fed. Reg. 47990, 48011 (November 16, 1990), and in 1999, see 64 Fed. Reg. 68722 (December 8, 1999).

<sup>5</sup> National Management Measures to Control Nonpoint Source Pollution from Forestry. Page 1-1. EPA-841-B-05-001, United States Environmental Protection Agency, April 2005. (Emphasis added.)

management activities have developed either regulatory or non-regulatory BMP programs under Sections 208 and 319 to achieve water quality goals. These BMPs are designed to take regional climate, soils, topography, biota, legal, technical and socioeconomic factors into account. BMPs vary among jurisdictions, which is understandable since a BMP that is appropriate for a coastal plain pine forest in Georgia may be wholly inadequate for a mountainous temperate rainforest in Oregon.

In spite of their variations, there are aspects common to most BMPs across jurisdictions. Forestry BMPs throughout North America are based on a common set of science-based principles.<sup>6</sup> Variation in BMPs among jurisdictions is attributable to efforts by states and provinces to apply core principles to their own circumstances. The general philosophy of BMPs is to “avoid, minimize, and mitigate.” More specifically, BMPs will generally strive to 1) minimize soil compaction and the extent of bare soils; 2) separate exposed soils from surface waters; 3) separate fertilizer and herbicide applications from surface waters; 4) inhibit hydraulic connections between bare ground and surface waters; 5) provide forested buffers around watercourses; and 6) promote stable roads and watercourse crossings.<sup>7</sup>

Different states manage BMPs in different ways. Some states employ mandatory BMPs administered by state foresters, forest practices boards or commissions under a focused state forest practices act.<sup>8</sup> Other states employ non-regulatory BMPs developed or approved by state agencies, with landowner education to encourage compliance, and authority for agencies to take action against landowners who do not comply.<sup>9</sup> Regardless of the approach, BMPs and the broader nonpoint source pollution prevention programs implemented by the states are subject to EPA oversight and approval. States whose water quality inventories fail to show continued improvement invite closer scrutiny and review by the EPA, and poor performance can result in grant funding reductions or a federal takeover of the state program. Over time, BMPs have become an accepted, well understood, widely adopted method of protecting water quality in the waters of the United States.

The content and use of BMPs are subject to both periodic review and continuous improvement. For example, BMPs have been employed in southern states for the past 30 years. Rates of implementation have been systematically measured and regularly reported by all 13 southern states. In addition, the Southern Group of State Foresters established a peer review process of

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<sup>6</sup> National Council for Air and Stream Improvement, Inc. (NCASI). 2009. *Compendium of forestry best management practices for controlling nonpoint source pollution in North America*. Technical Bulletin No. 966. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc.

<sup>7</sup> Olszewski, R. and C.R. Jackson. 2006. Best management practices and water quality. *In A primer on the top ten forest environmental and sustainability issues in the southern United States*. NCASI Special Report No. 06-06. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc.

<sup>8</sup> See National Council for Air and Stream Improvement, Inc. (NCASI). 2009. *Compendium of forestry best management practices for controlling nonpoint source pollution in North America*. Technical Bulletin No. 966. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc.

<sup>9</sup> *Ibid*; e.g., Technical Advisory Committee (TAC). 2008. *Silvicultural best management practices*. Tallahassee, FL: Florida Division of Agriculture and Consumer Services; Minnesota Forest Resources Council (MFRC). 2004 (2007 update). *Sustaining Minnesota forest resources: Voluntary site-level forest management guidelines for landowners, loggers and resource managers*. St. Paul, MN: Minnesota Forest Resources Council. [http://www.frc.state.mn.us/initiatives\\_sitelevel\\_management.html](http://www.frc.state.mn.us/initiatives_sitelevel_management.html).

member states' BMP programs to maximize consistency and quality. All 13 states have been reviewed during the past five years; most a second time. All have been responsive to the recommendations of the peer review teams.

## **2. Implementation rates for forestry best management practices are high and, when implemented, they are effective at protecting water quality.**

There is generally a high correlation between high water quality and forested areas. Most of the waters failing to meet EPA-approved water quality standards and requiring the establishment of Total Maximum Daily Load (TMDL) specifications are in urban or industrial areas. But this correlation alone does not prove the effectiveness of BMPs. Fortunately, a variety of watershed scale research projects in the published literature have evaluated the effectiveness of BMPs in the United States. These studies, some of which are summarized by Stednick and Ice,<sup>10</sup> have found BMPs to be highly effective when they are used. Other studies point out that the major impediment to the protecting water quality is the lack of compliance with BMPs.<sup>11</sup>

There are literally hundreds of paired watershed studies and other controlled experiments that have tested or are testing the effectiveness of contemporary forest practices and BMPs.<sup>12</sup> Some of these, such as the Piedmont Watershed Studies,<sup>13</sup> the Alto Watershed Study in East Texas,<sup>14</sup> and the Alsea Watershed Study and Watersheds Research Cooperative in Oregon,<sup>15</sup> have measured or are measuring improvements in water quality from managed forests for contemporary practices compared to historic impacts.

One study offered the following key points:<sup>16</sup>

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<sup>10</sup> Ice, G.G.; Stednick, J.D. (eds). 2004. *A Century of Forest and Wildland Watershed Lessons*. Bethesda, MD, USA: Society of American Foresters. 292 p.

<sup>11</sup> Ice, G.G.; Stewart, G.W.; Waide, J.B.; Irland, L.C.; Ellefson, P.V.; July, 2007. 25 Years of the Clean Water Act: How Clean are Forest Practices? *Journal of Forestry*. Pages 9-13.

<sup>12</sup> Ice, G.G. 2004. History of innovative Best Management Practice development and its role in addressing water quality limited waterbodies. *Journal of Environmental Engineering* 130(6):684-689; Ice and Stednick (2004). *A Century of Forest and Wildland Watershed Lessons*. Society of American Foresters, Bethesda, MD; Ice, G.G., Stednick, J.D., and Schilling, E.B. 2007. Introduction to evaluating the environmental effectiveness of contemporary forest practices. Presented at the 2007 Society of American Foresters National Convention; Portland, OR (Available from the National Council for Air and Stream Improvement, Inc. West Coast Regional Center, Corvallis, OR).

<sup>13</sup> Williams, T.M., D.D. Hook, D.J. Lipscomb, X. Zeng, and J. Albiston. 2000. Effectiveness of best management practices to protect water quality in South Carolina Piedmont. *General Technical Report SRS-30*, USDA Forest Service Southern Research Station, Asheville, N.C.

<sup>14</sup> McBroom, M.W., Beasley, R.S., Chang, M., and Ice, G.G. 2008. Stormwater runoff and sediment losses from forest clearcutting and stand re-establishment with best management practices in East Texas, USA. *Hydrological Processes* 22:1509-1522.

<sup>15</sup> Oregon Forest Resources Institute (OFRI). 2009. *Watershed science at work in Oregon's forests*. Special report. Portland, OR: Oregon Forest Resources Institute. <http://library.state.or.us/repository/2009/200906251557084/>.

<sup>16</sup> National Council for Air and Stream Improvement, Inc. (NCASI). 2009. *Compendium of forestry best management practices for controlling nonpoint source pollution in North America*. Technical Bulletin No. 966. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc. See also Ice, G.G., Schilling, E., and Vowell, J. 2010. Trends for forestry best management practices implementation. *Journal of Forestry* 108(6):267-273.

- Forestry BMP prescriptions vary among jurisdictions due to a multitude of factors, but properly implemented BMPs are effective regardless of jurisdictional requirements;
- While monitoring programs and protocols vary among jurisdictions, rates of BMP implementation are generally very high.
- Jurisdictions having long-term monitoring programs in place have shown steady improvement in compliance rates over time.
- Forest certification programs, along with education and outreach programs, have had a positive and significant role in increasing BMP compliance with the various jurisdictional recommendations and/or recommendations.

### **3. Impacts of forestry activities on water quality are typically short term and do not prevent attainment of water quality standards in a “reasonable period of time”**

Review of BMPs should also recognize that short-term impacts to water quality from a particular forest management activity are typically transient in nature and will not prevent attainment of water quality standards in a “reasonable period of time.” Sustainable forest management, which involves growing and harvesting long-lived perennial species, does not adversely affect the long-term condition of water quality or the watershed. (Although forestry operations create fewer water quality impacts than other sources,<sup>17</sup> major hydrologic events such as 100 year storms can nevertheless result in significant releases of sediments<sup>18</sup> when sound forest management practices have not been employed.) There may be short-term transient impacts from short-term forest management activities such as harvesting and regeneration, but water quality from managed forests using appropriate BMPs is high, especially when viewed over the life cycle of the particular forest stand. Some water quality impacts may also result from active management to achieve desired conditions, such as large conifers in the riparian zone, and these transient impacts that support long-term improvements in watershed conditions should also be recognized as not preventing attainment of water quality standards in a “reasonable period of time.”

Forests are managed over rotations or cutting cycles and there may be periodic disturbances. The patterns need to be recognized to promote the retention of the land in forest use rather than conversion to alternative, less desirable land uses. Disturbance is essential to the long-term conditions of forest watershed and stream systems. Forest BMPs are often designed to create conditions that promote favorable respond to disturbance events by allowing for recruitment of large wood, maintaining stable channels, or other aquatic functions.

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<sup>17</sup> National Water Quality Inventory: 2002 Report to Congress. EPA 841-R-07-001, United States Environmental Protection Agency, October 2007.

<sup>18</sup> National Management Measures to Control Nonpoint Source Pollution from Forestry. EPA-841-B-05-001, United States Environmental Protection Agency, April 2005.

MPs have become, therefore, effective tools to advance the goals of the Federal Clean Water Act. As a consequence of this success, BMPs are increasingly being used to address ancillary issues such as wildlife habitat and other issues, some of which fall under the cognizance of other federal laws.