Nos. 11-338, 11-347

IN THE
Supreme Court of the United States

DOUG DECKER, IN HIS OFFICIAL CAPACITY AS OREGON STATE FORESTER, *et al.*, *Petitioners*,

v.

NORTHWEST ENVIRONMENTAL DEFENSE CENTER, *et al.*, *Respondents*.

GEORGIA-PACIFIC WEST, INC., *et al.*, *Petitioners*,

v.

NORTHWEST ENVIRONMENTAL DEFENSE CENTER, *et al.*, *Respondents*.

On Writs of Certiorari to the United States Court of Appeals for the Ninth Circuit

BRIEF OF THE SOCIETY OF AMERICAN FORESTERS; NATIONAL ASSOCIATION OF STATE FORESTERS; ASSOCIATION OF CONSULTING FORESTERS OF AMERICA, INC.; NATIONAL ASSOCIATION OF FOREST SERVICE RETIREES; FORESTRY SCHOOLS; AND ACADEMICS AND FORESTRY PROFESSIONALS AS *AMICI CURIAE* IN SUPPORT OF PETITIONERS

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INTERESTS OF *AMICI CURIAE*

This case concerns environmental impacts associated with stormwater runoff from forest roads and particularly the use of best management practices ("BMPs") to control such impacts. *Amici* are forestry professionals, schools, academics, and scientists whose professional work focuses on forestry management and who are interested in the development and effectiveness of BMPs.[1]

The Society of American Foresters ("SAF") is the national scientific and educational organization that represents the forestry profession. SAF's 12,000 members are dedicated to the use of the knowledge, skills, and conservation ethic of the profession to ensure the continued health and use of forest ecosystems and the present and future availability of forest resources to benefit society.

The National Association of State Foresters ("NASF") is a non-profit organization that represents the directors of forestry agencies from the fifty States, eight U.S. Territories and associated States, and the District of Columbia. States have leading roles in controlling water quality impairments associated with nonpoint source pollution. State Foresters have the primary responsibility for administering forestry BMP programs designed to address nonpoint

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[1] No counsel for a party authored this brief in whole or in part, and no counsel or party made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *Amici*, their members, or their counsel made a monetary contribution to its preparation or submission. All parties have consented to the filing of this brief. The letters of consent have been filed with the Court.

source pollution from forestry activities under the Clean Water Act.

The Association of Consulting Foresters of America, Inc. ("ACF") has been dedicated to the needs and interests of consulting foresters since 1948 and has 650 members in 35 States. Consulting foresters are professional foresters who perform technical forestry work but do not work for a single full-time employer, instead offering their services on a fee or contract basis to the general public. ACF membership is prestigious. Members are required to have a Bachelor of Science degree in Forestry or Natural Resources from an approved college, as well as landowner and personal references, and must pursue continuing forestry education. A member's principal business activity must be forestry consulting, and candidates must not have an economic interest in a timber procurement entity.

The National Association of Forest Service Retirees ("NAFSR") is a national scientific and educational association whose members believe in the U.S. Forest Service and its mission. NAFSR members have dedicated their careers to the protection, development, and management of our Nation's National Forests and National Grasslands, as well as cooperation and information-sharing on these matters in the United States and around the world.

The State University of New York ("SUNY") College of Environmental Science and Forestry ("ESF") is the oldest and largest college in the United States that focuses exclusively on the natural environment. ESF has been a leader in environmental education since 1911. The college offers hundreds of courses in nine program areas and degrees ranging from the associate's degree in forest technology to the doctor of philosophy. The main campus in Syracuse is supplemented by 25,000 acres of field stations across New York State and in Costa Rica.

Auburn University's School of Forestry & Wildlife Sciences is home to the State of Alabama's oldest and largest forestry program and has been continuously accredited by SAF since 1950. The School offers undergraduate and graduate programs in natural resources and has a comprehensive research program that includes environmental assessments of forest management practices.

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SUMMARY OF ARGUMENT

The construction and maintenance of forest roads is an essential aspect of forest management. Forest roads not only provide access for timber harvesting but also are used for reforestation, fire control, wildlife habitat and stream improvement projects, and recreation. Since the inception of the Clean Water Act ("CWA" or "Act"), the U.S. Environmental Protection Agency ("EPA") has treated stormwater runoff associated with forest roads as "nonpoint source" flow that is properly managed at the state and local level through the use of BMPs.

Based on *Amici*'s experience and research, EPA's approach is sound. As reflected in the scientific literature, and confirmed by practical experience, BMPs are an effective and efficient approach to manage stormwater runoff in areas where silvicultural activities have occurred, including runoff from forest roads, ditches, and culverts.

State forestry BMP programs are widespread and robust. From the flat terrains of the South's Lower Coastal Plain to the steep inclines of the Pacific Northwest, forests differ substantially from one State to the next, and even within a State. States—with the support of professional forestry organizations—

have expended substantial resources to develop BMP programs that are tailored to the specific geographic, climatic, and topographic conditions within each State. As numerous studies demonstrate, these BMP programs are achieving their purpose—effective and efficient environmental protection—and continue to improve as States and forest professionals, including *Amici*, monitor and revise BMPs to address local environmental challenges.

The results demonstrate the wisdom of Congress's choice when it passed the CWA to mobilize all levels of government, employing all their complementary authorities, in the service of the CWA's ambitious water quality goals. This Court should reject the Ninth Circuit's decision to cast aside almost 40 years of successful environmental management in favor of an unworkable end-of-pipe permitting scheme ill-suited to diffuse stormwater runoff and contrary to Congress's intent, EPA's expert judgment, and sound forest science.

ARGUMENT

I. For Almost 40 Years, EPA Has Treated Forest Road Runoff as a Nonpoint Source To Be Managed Through BMPs Administered by States.

The CWA established a multi-faceted regulatory approach for restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. Grounded in cooperative federalism, the Act is a comprehensive statute that partners all levels of government to protect water quality.

On the one hand, Congress created a federal permitting program to manage end-of-pipe discharges from "point source[s]" (defined generally as "any discernible, confined and discrete conveyance"). CWA § 502(14), 33 U.S.C. § 1362(14). That National Pollutant Discharge Elimination System ("NPDES") program requires permits with precise effluent limitations for the discharge of pollutants into navigable waters of the United States from point sources. CWA § 402, 33 U.S.C. § 1342.

On the other hand, Congress knew that some sources of water pollution did not come out of the ends of pipes and recognized that traditional state authority over land and water resources could be effective in addressing those nonpoint sources. Thus, the Act "recognize[s], preserve[s], and protect[s] the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, [and] to plan the development and use (including restoration, preservation, and enhancement) of land and water resources." CWA § 101(b), 33 U.S.C. § 1251(b). And it deploys traditional state authorities to address the more diffuse sources of nonpoint pollution. In pursuit of the CWA's ambitious water quality goals, and using the cooperative federalism partnership established by the CWA, States have established water quality standards and have developed areawide treatment plans and management programs that address nonpoint source pollution. CWA §§ 208, 303 & 319, 33 U.S.C. §§ 1288, 1313 & 1329.

Although the CWA contains a general definition of "point source," Congress intended for EPA to issue "[g]uidance with respect to the identification of 'point sources' and 'nonpoint sources.'" 117 CONG. REC. 38,816 (1971). In particular, EPA was given the task of defining the contours of "nonpoint sources of pollutants," such as "agricultural and silvicultural activities, including runoff from fields and crop and forest lands." CWA § 304(f), 33 U.S.C. § 1314(f).

Acting pursuant to Congress's direction, EPA has—for almost 40 years—taken the position that runoff from forest roads, including runoff that has been diverted to ditches and other artificial conveyances, is a nonpoint source flow. *See, e.g.,* 41 Fed. Reg. 24,709, 24,710 (June 18, 1976) ("Silvicultural Rule") (now codified at 40 C.F.R. § 122.27); *see also* 41 Fed. Reg. 6281, 6282 (Feb. 12, 1976) (proposed Silvicultural Rule); 55 Fed. Reg. 47,990, 48,011 (Nov. 16, 1990) (stating EPA's intention to exclude nonpoint source silvicultural discharges from the NPDES stormwater permitting program under CWA § 402(p), 33 U.S.C. § 1342(p)). As EPA noted in 1975, "most rainfall runoff is more properly regulated under [CWA] section 208[2] . . . , whether or not the rainfall happens to collect before flowing into navigable waters," including "silvicultural runoff, . . . [which] frequently flows into ditches." 40 Fed. Reg. 56,932, 56,932 (Dec. 5, 1975). Thus, the Silvicultural Rule adopted in 1976 specifically excluded from NPDES permitting "nonpoint source activities inherent to silviculture such as . . . surface drainage[] and road construction and maintenance from which runoff results from precipitation events." 41 Fed. Reg. at 24,712.

As EPA has recognized from the beginning of the program, NPDES permitting was not designed for—and does not fit—the type of pollution created by forest road runoff. The NPDES program is designed

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[2] Section 208, 33 U.S.C. § 1288, sets forth the parameters for state-led areawide waste management treatment programs.

to control and eliminate discharges from discrete conveyances that are under the control of a single operator who can be held liable for the material discharged through the pipe. In contrast, the pollutants associated with forest road runoff "are induced by natural processes, including precipitation . . . and runoff," and "[t]he pollutants discharged are not traceable to any discrete or identifiable facility." *Id.* at 24,710. Accordingly, EPA determined that forest road runoff is "better controlled through the utilization of best management practices." *Id.*

For the reasons stated by Petitioners, it was well within EPA's authority to treat forest road runoff, including runoff in drainage ditches that are inherent to road construction and maintenance, as a nonpoint source discharge. Furthermore, as discussed by *Amici* in this brief, the on-the-ground results have borne out the wisdom of EPA's judgment. Through their nonpoint source CWA authority and their traditional authorities over land and water resources, States have widely implemented BMPs across the country. As numerous studies demonstrate, these BMPs are effective in mitigating environmental impacts from stormwater runoff associated with silvicultural activities.[3] In holding that channelized stormwater runoff from forest roads is subject to NPDES permit requirements, the Ninth Circuit has

[3] *See, e.g.*, Warren E. Archey, National Association of State Foresters, 2004 PROGRESS REPORT: STATE WATER RESOURCES PROGRAMS FOR SILVICULTURE iv (2004) (hereinafter NASF, 2004 PROGRESS REPORT); George Ice et al., *Programs Assessing Implementation and Effectiveness of State Forest Practice Rules and BMPs in the West,* 4 WATER AIR & SOIL POLLUTION 143, 161 (2004).

discredited nearly 40 years of state leadership in the effective development of forestry BMPs.

II. BMPs Are an Environmentally Sound and Efficient Approach for Controlling Stormwater Impacts from Silvicultural Activities, Including Forest Roads.

As defined in the *Dictionary of Forestry*, "silviculture" is "the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis."[4] Silviculture includes activities such as timber harvesting, reforestation, and the construction, use, and maintenance of forest roads.

Modern silvicultural science recognizes that these activities may have environmental impacts of differing nature and extent based on climate, topography, and the particular stage of a given silvicultural activity. Accordingly, state forestry agencies have worked with firms engaged in silvicultural activities, academics, regulatory administrators, and other forest professionals to develop BMPs that avoid and mitigate these impacts. These BMPs are widely implemented and highly effective, and are subject to continual refinement and improvement. In short, the use of forestry BMPs is an environmental success story that should not be brought to a premature end.

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[4] Society of American Foresters ("SAF"), DICTIONARY OF FORESTRY (2008), *available at* http://www.dictionaryofforestry.org/.

A. Environmental Impacts Associated with Silvicultural Activities

Properly undertaken, silviculture is a relatively benign land use with respect to its effects on water resources.[5] A principal environmental concern associated with runoff from silvicultural activities is sedimentation.[6] As defined by EPA, "[s]ediment is the solid material that is eroded from the land surface by water, ice, wind, or other processes and then transported or deposited away from its original location."[7] The source of sediment can vary based on topography (slope and surface roughness), precipitation type and intensity, and soil type.[8] In flatter areas, sediment can travel through erosion of the land surface, while in steeper areas it can also be dislodged through "mass wasting" (e.g., landslides).[9]

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[5] Dan Binkley & Thomas C. Brown, *Forest Practices as Nonpoint Sources of Pollution in North America*, 29 WATER RES. BULL. 729, 736, 738 (1993).

[6] *See* National Council for Air and Stream Improvement ("NCASI"), Special Report No. 12-01, ASSESSING THE EFFEC–TIVENESS OF CONTEMPORARY FORESTRY BEST MANAGEMENT PRACTICES (BMPS): FOCUS ON ROADS 1 (2012); NCASI Forest Watershed Task Group, FOREST ROADS AND AQUATIC ECOSYSTEMS: A REVIEW OF CAUSES, EFFECTS, AND MANAGEMENT PRACTICES 23 (2003) (hereinafter NCASI 2003 REPORT).

[7] EPA, EPA-841-B-05-0001, NATIONAL MANAGEMENT MEASURES TO CONTROL NONPOINT SOURCE POLLUTION FROM FORESTRY, Ch. 2 at 9 (2005) (hereinafter EPA GUIDANCE).

[8] NCASI 2012 REPORT, *supra* note 6, at 17.

[9] EPA GUIDANCE, *supra* note 7, Ch. 2 at 9.

Sediment delivery through natural processes, and in some instances human-induced disturbances (e.g., landslides), is the principal method by which gravel substrates that are important to salmon spawns enter streams in the Northwest. But sediment delivery to streams can also cause stream turbidity (which is the cloudiness in water caused by suspended particles) and sediment deposition (which causes accumulation of larger particles within channels).[10] If BMPs are not properly implemented, silvicultural activities can cause other impacts on the aquatic environment, including changes in a forest's hydrologic processes through alteration of water flow,

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[10] These two impacts of sedimentation affect aquatic biota differently. Turbidity has been shown in controlled experiments to alter feeding efficiency and growth. John A. Sweka & Kyle J. Hartman, *Effects of Turbidity on Prey Consumption and Growth in Brook Trout and Implications for Bioenergetics Modeling*, 58 CAN. J. FISHERIES & AQUATIC SCI. 386, 392 (2001). In natural conditions, however, trout were able to feed when turbidity limited visibility. Jason L. White & Bret C. Harvey, *Winter Feeding Success of Stream Trout Under Different Streamflow and Turbidity Conditions*, 136 TRANSACTIONS AM. FISHERIES SOC'Y 1187, 1191 (2007). Excess sediment deposition can inhibit fish larvae from emerging from eggs and limit habitat by filling pools. Thomas S. Fudge et al., *Effect of Different Levels of Fine-Sediment Loading on the Escapement Success of Rainbow Trout Fry from Artificial Redds*, 28 N. AM. J. FISHERIES MGMT. 758, 758 (2008); Thomas E. Lisle & Sue Hilton, *Fine Bed Material in Pools of Natural Gravel Bed Channels*, 35 WATER RES. RESEARCH 1291, 1302 (1999).

channel encroachment,[11] and prevention of fish passage through culverts.[12]

The environmental effects of silvicultural activities on water quality are relatively minimal compared to other land uses.[13] Although forests occupy about one-third of the land base in the United States, silvicultural impacts are associated with fewer than five percent of impaired rivers and streams nationwide.[14] In 30 of the 45 States that have reported information to EPA about probable sources of water quality impairment, silviculture is not considered a probable source for *any* impairments. Indeed, silvicultural impacts on water resources are substantially less significant than impacts from wildlife and other natural causes.

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[11] Channel encroachment is a relic of past practices. "State regulations and forestry BMPs no longer allow road[]" construction "directly adjacent to and within stream channels." NCASI 2003 REPORT, *supra* note 6, at 22.

[12] *Id.* at 7-8.

[13] Dan Binkley & Thomas C. Brown, U.S. Department of Agriculture ("USDA"), Forest Service, General Technical Report RM-239, MANAGEMENT IMPACTS ON WATER QUALITY OF FORESTS AND RANGELANDS 5 (1993).

[14] Data on impaired rivers and streams cited herein were acquired from EPA's Watershed Assessment, Tracking, and Environmental Results (WATERS) website and validated using web reports generated using the National Summary of Assessed Waters Report (http://www.epa.gov/waters/ir/) in the Assessment, TMDL Tracking and Implementation System (ATTAINS) integrated reporting database.

B. Addressing Silvicultural Impacts Through BMPs

Stormwater runoff from forest roads and other silvicultural activities is different in kind from the pollution that is typically addressed through the CWA Section 402 NPDES permitting program.[15] The typical NPDES permittee is a sewage treatment plant or an industrial plant that discharges its wastewater through outfall pipes to a nearby waterbody. NPDES permits control the composition of the wastewater and require treatment at the point of discharge and monitoring of the final effluent to meet specified permit limits.[16]

Stormwater runoff, by contrast, runs across a landscape and generally covers a large area of land and many miles of roads owned and used by many different persons for a variety of activities.[17] Thus, there is no distinct source of sediment, and no single landowner or forest manager is in a position to control what happens to the water or to operate a treatment process prior to the stormwater entering a stream.

Moreover, "pollutants" (including sediment) associated with silvicultural activities are derived from the natural environment and at certain levels can be

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[15] *Cf.* George Ice, *History of Innovative Best Management Practice Development and Its Role in Addressing Water Quality Limited Waterbodies*, 130 J. ENVTL. ENGINEERING 684, 685 (2004) (hereinafter Ice, *History of BMPs*) (comparing characteristics of point sources and nonpoint sources of pollution).

[16] 41 Fed. Reg. at 24,710 ("[P]oint sources of water pollution are generally characterized by discrete and confined conveyances from which discharges of pollutants into navigable waters can be controlled by effluent limitations.").

[17] 77 Fed. Reg. 30,473, 30,475 (May 23, 2012).

beneficial to the ecosystem.[18] The pollutant load (i.e., the amount of pollutants carried by the water) is generally low, is difficult to monitor, and varies over time depending on the stage and nature of the silvicultural activity.[19] Water quality effects are usually greatest in the first two to three years of silvicultural activity and "almost universally diminish" thereafter.[20] Finally, it is "difficult to establish representative monitoring" conditions because weather and hydrology (water flow patterns) affect pollutant levels in unpredictable ways.[21] For all these reasons, as Congress and EPA have long recognized, silvicultural activities do not pose the type of end-of-pipe problem that is conducive to an NPDES permitting solution.

Instead, States rely on BMPs as the "building blocks"[22] of their forestry nonpoint source management programs.[23] A BMP is "a practice or usually a combination of practices that are determined by a state or a designated planning agency to be the most

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[18] Ice, *History of BMPs*, *supra* note 15, at 685.

[19] *Id.*

[20] Christopher J. Anderson & B. Graeme Lockaby, *The Effectiveness of Forestry Best Management Practices for Sediment Control in the Southeastern United States: A Literature Review*, 35 S.J. APPLIED FORESTRY 170, 173 (2011).

[21] Ice, *History of BMPs*, *supra* note 15, at 685; *see also* George G. Ice & Stephen H. Schoenholtz, *Understanding How Extremes Influence Water Quality: Experience from Forest Watersheds*, 19 HYDROLOGICAL SCI. TECH. 99, 104 (2003) (explaining effects of major extreme events such as fire and flood).

[22] EPA GUIDANCE, *supra* note 7, Ch. 2 at 17.

[23] NCASI, Technical Bull. No. 966, COMPENDIUM OF FORESTRY BEST MANAGEMENT PRACTICES FOR CONTROLLING NONPOINT SOURCE POLLUTION IN NORTH AMERICA 1 (2009) (hereinafter NCASI COMPENDIUM).

effective and practicable means (including technological, economical, and institutional considerations) of controlling point and nonpoint source pollutants at levels compatible with environmental quality goals."[24] The development of BMPs is a multi-step process that is based on unifying scientific principles.[25] A problem is identified, potential solutions are identified and analyzed, specific management practices are developed, testing is conducted to determine effectiveness, and practices are refined and adapted as needed.[26] This process is continually repeated, ensuring that BMPs address the latest issues with the best and most up-to-date science.

BMPs have been developed for virtually all stages and aspects of silviculture: preharvest planning, streamside management areas, road construction/reconstruction, road management, timber harvesting, site preparation and forest regeneration, fire management, revegetation of disturbed areas, forest chemical management, and wetland forest management.[27] Within each of these BMP categories, there are numerous specific BMPs.[28] Some BMPs are

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[24] SAF, DICTIONARY OF FORESTRY, *supra* note 4.

[25] *See* NCASI COMPENDIUM, *supra* note 23, at President's note. Core BMP themes include: "1) minimizing soil compacttion and the extent of bare soils; 2) separating exposed soils from surface waters; 3) separating fertilizer and herbicide applications from surface waters; 4) inhibiting hydraulic connections between bare ground and surface waters; 5) providing forested buffers around watercourses; and 6) designing stable roads and watercourse crossings." *Id.* at 194 (internal citation omitted).

[26] Ice, *History of BMPs*, *supra* note 15, at 685-86.

[27] EPA GUIDANCE, *supra* note 7, Ch. 3 at 1.

[28] *Id.*

structural (e.g., installation of drainage ditches and coverage of the road surface with gravel or mulch), and others are operational (e.g., restrictions on road use or other activities during storm events and maintenance of a minimum buffer width between ongoing silvicultural activities and neighboring streams).[29] These requirements are often highly specific to a given location. For example, Oregon's BMPs require certain numbers, types, and sizes of trees in streamside management areas.[30]

In the Pacific Northwest—which has large forest resources supporting extensive silvicultural activity—BMPs are incorporated into each State's Forest Practices Act and implementing regulations.[31] In many States, BMPs are set out in a BMP guidance manual that provides landowners and loggers with a menu of options from which to tailor environmental protection measures at each site. State BMP guidance is extensive. For example, Florida's BMP manual spans 116 pages;[32] Texas's forestry and forest wet-

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[29] *Id.,* Ch. 2 at 17.

[30] George G. Ice et al., *Trends for Forestry Best Management Practices Implementation*, 108 J. FORESTRY 267, 268 (2010) (hereinafter Ice et al., *Trends*).

[31] Council of Western State Foresters, FORESTRY BEST MANAGEMENT PRACTICES FOR WESTERN STATES: A SUMMARY OF APPROACHES TO WATER QUALITY IMPLEMENTATION AND EFFECTIVENESS MONITORING 5, 10, 13 (2007); *see also, e.g.*, California Department of Forestry and Fire Protection Resource Management, Forest Practice Program, CALIFORNIA FOREST PRACTICE RULES (2012); Paul W. Adams, *Oregon's Forest Practice Rules*, THE WOODLAND WORKBOOK (Oregon State University Extension Service, 1996).

[32] Florida Division of Agriculture & Consumer Services Technical Advisory Committee, SILVICULTURE BEST MANAGEMENT PRACTICES (2011).

land guidelines and recommendation specifications are over 100 pages;[33] and Minnesota's management guidelines are hundreds of pages in length (including 49 pages on forest roads).[34]

There are a number of BMPs specifically targeted to control sedimentation from forest road runoff. Under modern BMPs, a well-designed forest road is not simply a flat surface. Rather, a forest road is designed in light of local conditions, including the slope on which it sits, which in turn dictates the type of road drainage structures that will be needed, including, as appropriate, culverts, ditches, waterbars,[35] dips, and other drainage structures to manage and control rainfall flows. As shown in Figure 1, the "road prism" is "comprised of the road cutslope, the road tread, the road fillslope, and any additional widening for ditches, berms [i.e., raised barriers], or other disturbed surfaces that are structural parts of the road right-of-way."[36]

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[33] Texas Forest Service & Texas Forestry Association, TEXAS FORESTRY BEST MANAGEMENT PRACTICES (2010) (hereinafter TEXAS BMP MANUAL).

[34] Minnesota Forest Resources Council, SUSTAINING MINNESOTA FOREST RESOURCES: VOLUNTARY SITE-LEVEL FOREST MANAGEMENT GUIDELINES FOR LANDOWNERS, LOGGERS AND RESOURCE MANAGERS (2005, 2007 update).

[35] Waterbars are "speed bumps" for water that interrupt stormwater flow to limit the distance and speed that water flows along the surface of the road.

[36] NCASI 2003 REPORT, *supra* note 6, at 2.

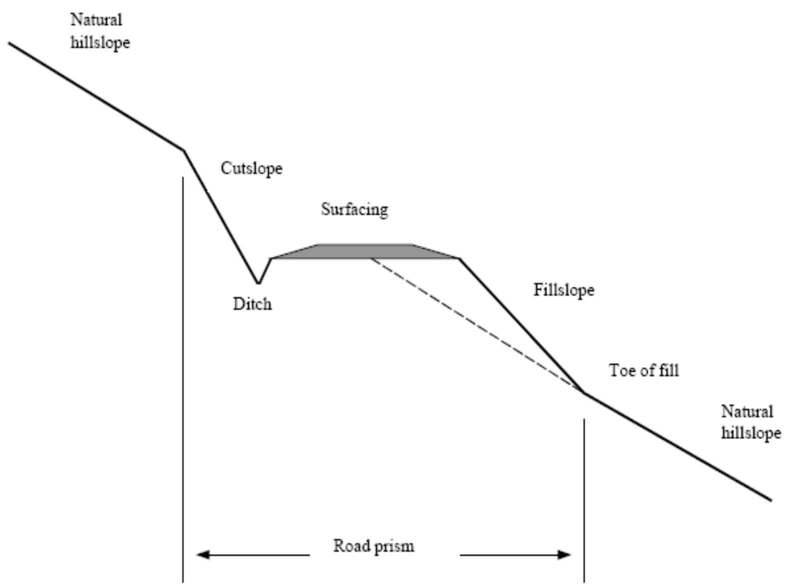

Figure 1. Road Prism Structural Features

Source: NCASI 2003 REPORT, *supra* note 6, at 2 (adapted from Oregon Department of Forestry, FOREST ROAD MANAGEMENT GUIDEBOOK: MAINTENANCE AND REPAIRS TO PROTECT FISH HABITAT AND WATER QUALITY (2000)).[37]

Many forest road BMPs focus on controlling runoff and dispersing water across the forest floor in order to avoid concentrated flows into neighboring streams. For example, Texas mandates that "[r]oad gradients . . . should be changed to disperse surface water at least 50 feet from the *stream*" and also prescribes spacing distances between waterbars based on the grade of the road.[38]

[37] This figure illustrates a cross-section of a forest road in the steep terrain of Oregon.

[38] TEXAS BMP MANUAL, *supra* note 33, at 31, 36 (emphasis in original).

As these examples illustrate, BMPs are carefully designed to mitigate the environmental impacts associated with silvicultural activities, including forest road runoff. As discussed below, BMPs are tailored to the individual States—and even to local conditions within the States—and are being implemented at very high rates throughout the country.

C. Implementation at the State Level

BMPs are effective and efficient because they are tailored to local conditions in individual States. A host of local conditions influence the choice of BMPs, including: forest conditions (e.g., size, type, and harvesting and regeneration methods); topography; soil erodibility and infiltration characteristics; precipitation amount, intensity, and form (e.g., snow); and forest ownership (i.e., industrial, private, state government, or federal government).

For example, BMPs applicable to the steep terrain and high rainfall areas of the Coast Range in parts of Oregon would impose an unnecessary expense in a State like Florida—where forest roads are generally constructed on relatively flat terrain with sandy, well-drained soils—or even in other flatter, more arid areas of Oregon. And in the flat terrain of a North Carolina wet pine forest, installation of a continuous berm along the side of a road can be highly effective in minimizing accumulation of sediment in roadside ditches, while erosion could actually be exacerbated if a berm were constructed in the steeper inclines of North Carolina's Piedmont.[39] Because of States'

[39] NCASI, Comments on 77 Fed. Reg. 30,473 (May 23, 2012), Docket ID No. EPA-HQ-OW-2012-0195-0103 (June 21, 2012), at 9.

familiarity with their own terrain, they can account for these critical differences in designing BMPs.

State BMP programs rely on a variety of tools to promote BMP implementation, including: regulatory requirements; education and training; demonstration projects; research on BMP effectiveness; and monitoring of BMP use. In some States, forest landowners must notify the State prior to road construction and comply with an approved road construction plan. Many other States have established training and incentive programs for landowners and loggers to promote the use of forestry BMPs where their use is recommended but not required.[40]

State BMP programs are supplemented and reinforced by certification programs, including the Sustainable Forestry Initiative ("SFI"), the Forest Stewardship Council, and the American Tree Farm System.[41] Participation in these certification programs—undertaken by a majority of large forest products and landholding firms in the United States—requires implementation of BMPs.[42] In addi-

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[40] *E.g.,* NCASI COMPENDIUM, *supra* note 23, at 55 (Colorado).

[41] *E.g.,* Hughes Simpson et al., Texas Forest Service, VOLUNTARY IMPLEMENTATION OF FORESTRY BEST MANAGEMENT PRACTICES IN EAST TEXAS: RESULTS FROM ROUND 7 OF BMP IMPLEMENTATION MONITORING 2007-2008, at 32 (2008); Arkansas Forestry Commission, FORESTRY BEST MANAGEMENT PRACTICES FOR WATER QUALITY PROTECTION IN ARKANSAS IMPLEMENTATION REPORT 26 (2005); Maine Department of Conservation & Maine Forest Service, MAINE FORESTRY BEST MANAGEMENT PRACTICES USE AND EFFECTIVENESS—2005-2009, at 1 (2010) (hereinafter MAINE BMP STUDY).

[42] *See, e.g.,* SFI, 2010-2014 Standard (2010), *available at* http://www.sfiprogram.org/files/pdf/Section2_sfi_requirements_2010-2014.pdf (Objective 3: requiring compliance with applicable laws, including those related to BMPs, on SFI-certified forest

tion, standard commercial contracts between companies that procure large amounts of wood and market participants upstream in the wood supply chain (including loggers and haulers) require use of BMPs and provide that payment may be reduced or withheld if BMPs are not followed.

The various approaches for promoting the use of forestry BMPs are working. Implementation rates have increased significantly over the past 20 years. In Montana, for example, the BMP implementation rate rose from 78 percent in 1990 to 97 percent in 2010.[43] In Florida, the implementation rate rose from under 85 percent in 1985 to 98.7 percent in 2011.[44] Today, the BMP implementation rate across States is high. For example, a recent nationwide evaluation estimated overall forestry BMP implementation at 89 percent.[45] Over 81 percent of the Nation's timber harvest comes from 16 States, which have an implementation rate over 90 percent.[46] The fact that States with the highest timber production also tend to have the highest implementation rates demonstrates that

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lands; Objective 10: requiring SFI-certified companies to mandate the use of sustainable forestry practices and monitor BMP conformance).

[43] Montana Department of Natural Resources & Conservation, Forestry Division, MONTANA FORESTRY BEST MANAGEMENT PRACTICES MONITORING: 2010 FORESTRY BEST MANAGEMENT PRACTICES FIELD REVIEW RESULTS 2 (2010); *see also* Brian D. Sugden et al., *Montana's Forestry Best Management Practices Program: 20 Years of Continuous Improvement*, 110 J. FORESTRY 328 (2012).

[44] Jeff Vowell et al., Florida Department of Agriculture & Florida Forest Service, SILVICULTURAL BEST MANAGEMENT PRACTICES 2011 IMPLEMENTATION SURVEY REPORT 6 (2012).

[45] Ice et al., *Trends*, *supra* note 30, at 271.

[46] *Id.*

cooperative federalism is working: States with the largest forest resources, and most extensive forest activities, are leaders in BMP implementation.

Results of BMP implementation surveys and other field assessments are helping States to identify and control impacts on water resources from forest roads in particular. In Texas, for example, surveys conducted in the 1990s revealed that BMP implementation rates for temporary roads were substantially lower than the State's average for all BMP categories (e.g., 78 percent vs. 88.6 percent in 1998-1999).[47] In response, the Texas Forest Service and other stakeholders placed greater emphasis on temporary roads in their BMP education and training programs. In the 2010-2011 survey, the BMP implementation rate for temporary roads had increased to 98 percent, and exceeded the average rate of 94.1 percent for all BMP categories.[48]

D. Effectiveness of Forestry BMPs

The potential of forestry BMPs to mitigate environmental impacts was recognized early in their development. In 1979, a study of the Grant Forest Watershed in Georgia predicted that three management changes—(1) better road design, location, and maintenance, (2) wider buffers around streams, and (3) avoidance of machine planting of vegetation in

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[47] Burl Carraway et al., Texas Forest Service, VOLUNTARY COMPLIANCE WITH FORESTRY BEST MANAGEMENT PRACTICES IN EAST TEXAS: RESULTS FROM ROUND 4 OF BMP MONITORING (2000).

[48] Hughes Simpson et al., Texas Forest Service, VOLUNTARY IMPLEMENTATION OF FORESTRY BEST MANAGEMENT PRACTICES IN EAST TEXAS: RESULTS FROM ROUND 8 OF BMP IMPLEMENTATION MONITORING 2010-2011, at 13, 36 (2011).

areas subject to historic disturbances—could reduce sediment movement by a factor of ten.[49] Subsequent studies confirmed that installation of BMPs reduced sediment levels by approximately the same degree that the 1979 study had predicted.[50]

The results of similar paired watershed studies—where modern-era BMPs are compared to historical practices—have demonstrated the effectiveness of BMPs elsewhere in the country. Study of the Alto Watershed in East Texas found that the use of modern BMPs resulted in one-fifth the sediment load observed in the 1980s.[51] A 1998 study of California's Caspar Creek showed a significant reduction in sediment load following imposition of forest practice rules.[52] In a 2009 study of a watershed in Washing-

[49] *See* John D. Hewlett, FOREST WATER QUALITY: AN EXPERIMENT IN HARVESTING AND REGENERATING PIEDMONT FORESTS 21 (University of Georgia School of Forest Resources Press, 1979).

[50] Noah E. Fraser, *A Paired Watershed Investigation of Clearcut BMPs Revisited: B.F. Grant Memorial Forest, Georgia After the Thirty-Year Growing Cycle*, Master's Thesis, University of Georgia, at 95 (2006); *see also* Thomas M. Williams et al., *Effectiveness of Best Management Practices To Protect Water Quality in South Carolina Piedmont*, PROCEEDINGS OF THE TENTH BIENNIAL SOUTHERN SILVICULTURAL RESEARCH CONFERENCE 276 (1999).

[51] *See*, *e.g.,* W.H. Blackburn et al., *Stormflow and Sediment Loss from Intensively Managed Forest Watersheds in East Texas,* 26 WATER RES. BULL. 465 (1990) (initial study of Alto Watershed in East Texas); Matthew W. McBroom et al., *Storm Runoff and Sediment Losses from Forest Clearcutting and Stand Re-establishment,* 22 HYDROLOGICAL PROCESSES 1509, 1520 (2008) (follow-up study).

[52] Peter H. Cafferata & Thomas E. Spittler, *Logging Impacts of the 1970's vs. the 1990's in the Caspar Creek Watershed,* in USDA, Forest Service, General Technical Report PSW-GTR-168,

ton State, thirty years of monitoring data show reductions in turbidity over time. The study's authors concluded that "[o]ur results suggest that increased attention to reducing sediment production from roads and minimizing the amount of road runoff reaching stream channels has been the primary cause of the declining turbidity levels observed in this study."[53]

An early study of the Alsea Watershed in Oregon led to Oregon's adoption of the Oregon Forest Practices Act ("OFPA") rules in 1972.[54] The original Alsea Watershed study took place from 1958 to 1973 and monitored the effects of timber harvesting without use of contemporary BMPs on water quality and aquatic habitats, including salmon populations. Needle Branch, an intensively harvested watershed in the Alsea study, was extensively clearcut and subsequently slashed and burned, leaving it with no streamside vegetative buffers.[55] With the imple-

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PROCEEDINGS OF THE CONFERENCE ON COASTAL WATERSHEDS: THE CASPAR CREEK STORY 113 (1998).

[53] Maryanne Reiter et al., *Temporal and Spatial Turbidity Patterns Over 30 Years in a Managed Forest of Western Washington*, 45 J. AM. WATER RES. ASS'N 793, 793 (2009).

[54] Ice, *History of BMPs*, *supra* note 15, at 686.

[55] George G. Ice et al., *Forest Management To Meet Water Quality and Fisheries Objectives: Watershed Studies and Assessment Tools in the Pacific Northwest*, in George G. Ice & John D. Stednick, eds., A CENTURY OF FOREST AND WILDLAND WATERSHED LESSONS 240 (2004). Modern-day OFPA rules require buffers around fish-bearing streams, additional protection around non-fish-bearing streams, rules to keep fresh slash (e.g., harvest debris) out of state jurisdictional waters, rules on maximum clearcut size, "green-up" reforestation requirements between harvests, and other BMPs, including for roads.

mentation of contemporary forestry BMPs, Needle Branch has experienced some of the most dramatic reductions in stream impacts that have ever been achieved with modern BMPs.[56]

Studies focused on specific BMP types—including BMPs for forest roads—have confirmed the effectiveness of BMPs at a micro level. One study in Georgia showed that reconstruction of forest roads with BMPs lowered the sediment yield, as compared to pre-BMP roads, by 70 percent.[57] In Oklahoma, installation of BMPs on unpaved rural roads, which are similar in character to forest roads, reduced the sediment load by up to 80 percent.[58]

Road segment BMP studies have focused on everything from how different road shapes and surfaces affect erodibility and traffic impacts[59] to how seeding,

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[56] *See* Ice, *History of BMPs*, *supra* note 15, at 687.

[57] Mark S. Riedel & James M. Vose, *Collaborative Research and Watershed Management for Optimization of Forest Road Best Management Practices*, INTERNATIONAL CONFERENCE OF ECOLOGY AND TRANSPORTATION PROCEEDINGS 148, 148, 156 (Federal Highway Administration, 2003).

[58] Donald J. Turton et al., *Effectiveness of BMPs in Reducing Sediment from Unpaved Roads in the Stillwater Creek, Oklahoma Watershed*, 45 J. AM. WATER RES. ASS'N 1343, 1343-44 (2009).

[59] Elizabeth M. Toman & Arne E. Skaugset, *Designing Forest Roads To Minimize Turbid Runoff During Wet Weather Use*, PROCEEDINGS OF THE FOURTH CONFERENCE ON WATERSHED MANAGEMENT TO MEET WATER QUALITY STANDARDS AND TMDLS (Am. Soc'y of Agric. & Biological Eng'rs, 2007); Drew B.R. Coe, *Sediment Production and Delivery from Forest Roads in the Sierra Nevada, California*, Master's Thesis, Colorado State University (2006); L.W. Swift, Jr., *Gravel and Grass Surfacing Reduces Soil Loss from Mountain Roads*, 30 FOREST SCI. 657 (1984).

mulching, and application of slash affect erosion from the road prism's surface and cut-and-fill slopes.[60] These studies demonstrate that just a single improved management practice can result in a significant reduction in a road's environmental impacts. For example, one study found that including a continuous berm at a road's edge could lead to a 99 percent reduction in sediment loss.[61]

Focused studies of forestry practices have enabled States and forest managers to target problems and engage in adaptive management. For example, sidecast roads—roads constructed on a steep incline and stabilized by the addition of loosely compacted material at the downhill edge of a road prism—were common practice in the 1970s. Studies showed, however, that sidecast roads in the Pacific Northwest contributed to landslides during intense storms because the loosely compacted material was prone to washout.[62] In response, States amended their BMPs

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[60] Walter F. Megahan, *Erosion Processes on Steep Granitic Road Fills in Central Idaho*, 42 SOIL SCI. SOC'Y AM. J. 350 (1978); Dale J. McGreer, *A Study of Erosion from Skid Trails in Northern Idaho*, in NCASI, Technical Bulletin No. 353, MEASURING AND ASSESSING THE EFFECTIVENESS OF ALTERNATE FOREST MANAGEMENT PRACTICES ON WATER QUALITY 1 (1981); C.R. Wade et al., C*omparison of Five Erosion Control Techniques for Bladed Skid Trails in Virginia*, S.J. APPLIED FORESTRY (in press).

[61] T.W. Appelboom et al., *Management Practice for Sediment Reduction from Forest Roads in the Coastal Plain*, 45 TRANSACTIONS AM. SOC'Y AGRIC. ENG'RS 337, 343 (2002).

[62] NCASI, Technical Bulletin No. 456, CATALOG OF LANDSLIDE INVENTORIES FOR THE NORTHWEST 30-32 (1985); *see also* Robert L. Beschta & William L. Jackson, *Forest Practices and Sediment Production in the Alsea Watershed Study*, in J.D. Stednick, ed.,

to prohibit sidecast road construction in areas susceptible to landslides. Subsequent reviews suggest that avoiding construction of sidecast roads has reduced landslide incidents.[63] Furthermore, legacy road conditions, such as sidecast roads constructed in landslide-prone areas, are most effectively addressed as part of ongoing commercial harvesting operations that follow contemporary road BMPs.

E. Continued Enhancement of Forestry BMP Programs

Although BMPs have already been demonstrated to be highly effective in avoiding and mitigating environmental impacts from silvicultural activities, the federal and state governments, as well as organizations and academics such as *Amici*, continue to study and improve forestry BMP programs.

The National Association of State Foresters completed a comprehensive survey of state BMPs in 2004 and is in the process of updating that survey.[64] The Southern Group of State Foresters ("SGSF") and the Northeastern Area Association of State Foresters ("NAASF") have regional monitoring protocols in place to promote consistency in BMP monitoring across States.[65] Moreover, SGSF has peer-reviewed

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HYDROLOGICAL AND BIOLOGICAL RESPONSES TO FOREST PRACTICES: THE ALSEA WATERSHED STUDY 66 (2008).

[63] E. George Robison et al., Oregon Department of Forestry, STORM IMPACTS AND LANDSLIDES OF 1996: FINAL REPORT 10-11 (1999).

[64] NASF, 2004 PROGRESS REPORT, *supra* note 3.

[65] Ice et al., *Trends*, *supra* note 30, at 269; SGSF Water Resources Committee, SILVICULTURAL BEST MANAGEMENT PRACTICES IMPLEMENTATION MONITORING: A FRAMEWORK FOR STATE FORESTRY AGENCIES (2007); Kristina Ferrare et al.,

all BMP programs in its 13 member States at least once in the last five years.[66] The Council of Western State Foresters also has analyzed BMP compliance and effectiveness monitoring.[67]

EPA and other federal agencies support the continual improvement of BMP programs through both technical and financial assistance. In 2005, EPA prepared a comprehensive guidance document entitled *National Management Measures To Control Nonpoint Source Pollution from Forestry*.[68] This more than 200-page document inventoried types of management measures across ten categories in order to "provide technical assistance to state water quality and forestry program managers, nonindustrial private forest owners, industrial forest owners, and others involved with forest management."[69] And the U.S. Department of Agriculture partnered with NAASF to develop its BMP monitoring protocol,[70]

USDA, Forest Service, NA-FR-02-07, BEST MANAGEMENT PRACTICES (BMP) MANUAL—DESK REFERENCE: IMPLEMENTATION AND EFFECTIVENESS FOR PROTECTION OF WATER RESOURCES (2007) (hereinafter NAASF DESK REFERENCE); *see also infra* note 70 & accompanying text.

[66] National Alliance of Forest Owners, Comments on 77 Fed. Reg. 30,473 (May 23, 2012), Docket ID No. EPA-HQ-OW-2012-0195-0134 (June 22, 2012), at 5.

[67] Council of Western State Foresters, *supra* note 31.

[68] EPA GUIDANCE, *supra* note 7.

[69] *Id.*, Ch. 1 at 1.

[70] The protocol software developed is accompanied by two guidance documents. NAASF DESK REFERENCE, *supra* note 65, at 2; David Welsch et al., USDA, Forest Service, NA-FR-02-06, BEST MANAGEMENT PRACTICES (BMP) MONITORING MANUAL—FIELD GUIDE: IMPLEMENTATION AND EFFECTIVENESS FOR PROTECTION OF WATER RESOURCES 2 (2007).

which was funded initially by EPA and the U.S. Forest Service.[71] As additional collaborative studies are conducted, BMPs are continually improved.

CONCLUSION

For the last four decades, EPA has quite sensibly treated forest road runoff as nonpoint source pollution to be controlled at the state level through the use of BMPs. In support of the cooperative federalism framework of the Clean Water Act, States—in partnership with the federal government, private industry, academics and other forestry professionals, and organizations like *Amici*—have responded to EPA's wise policy choice by developing, implementing, studying, and continually refining BMPs. As a result of this longstanding approach, road drainage structures are being disconnected from streams, road and stream crossings are being upgraded, landslides from forest roads are being reduced, BMP education and forest certification programs continually share lessons learned, and the environment is being protected.

In contrast to the proven effectiveness of BMPs, the NPDES permitting system is ill-suited to address the environmental impacts associated with forest road runoff. Unlike the end-of-pipe problem for which NPDES permitting was designed, forest road runoff is generally characterized by contribution from diffuse sources of low loads of natural pollutants, and, as such, it does not fit the NPDES permitting model.

[71] MAINE BMP STUDY, *supra* note 41, at 3 (explaining development of regional protocol).

Amici respectfully request that the Court allow the States and their partners to continue their effective work of controlling runoff from forest roads through implementation of BMPs and not impose an unnecessary and inefficient permitting system in BMPs' stead.

The judgment of the Court of Appeals should be reversed.

Respectfully submitted,

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