

Enforcement of Laws, Regulations and Guidelines (Indicator 57)¹

Extent to which institutional framework supports . . . Including the Capacity To Enforces Laws, Regulations and Guidelines

Rationale and Interpretation

The achievement of conditions conducive to forest conservation and sustainability implies that various biophysical standards (for example, forestry best management practices) and assorted political processes (for example, collaborative processes, legislative processes) have been appropriately engaged and applied. In many cases, such will occur in response to market systems or to various participatory processes involving different segments of the public. However, there are circumstances in which the application of sustainability standards occurs only in response to the fear of penalty or punishment. Some unwilling persons or entities respond only to the imposition of a sanction in the form of an order, fine, or incarceration. Without some form of adequately and appropriately applied enforcement effort to which landowners or timber harvesters must respond, the effectiveness of laws, regulations, and guidelines focused on forest resources may be substantially diminished in some circumstances (Roundtable on Sustainable Forestry 1999).

Useful data for measuring institutional capacity to accomplish this indicator are compilations and descriptions of laws and programs at national and subnational levels that enforce (or promote) conditions considered essential to forest sustainability. For example, legally authorized penalties and jail sentences, number of personnel employed in enforcement roles, administrative and judicial review capabilities, number and type of programs and databases and clearinghouses established for purposes of monitoring violations. The laws that require enforcement actions relevant to sustaining forest conditions are far-ranging, most often addressing (for example) conditions of the environment (air, water, pesticides, hazardous waste), fisheries and wildlife (harvest limits, species preservation, subsistence hunting), timber harvesting (road construction, harvest limits, health and safety), and special features protection (sensitive or fragile areas containing unique environmental attributes or resources). In addition there are many laws that promote sustainability in

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manners less harsh than might be suggested by commonly thought of enforcement actions, namely education, technical assistance, fiscal incentives and tax incentives. In a broader sense, the latter programs may also be considered enforcement mechanisms even though their appeal is to landowner and timber harvester self interests.

Suggested by Indicator 57 are various concepts and principles that need to be addressed. To guide this review, brief definitions of four important concepts are *enforcement* — actions taken to ensure application of biophysical or process standards that are considered necessary for the sustainability of forests (means taken to compel conformity with desired conditions or implementation of favored programs) (for example, inspections, investigations, imposition of fines); *laws* — legislatively binding and authoritatively prescribed standards that must be adhered to in order to accomplish forest sustainability (for example, air and water quality laws); *regulations* — operational procedures (interpreted and enforced by public agencies) that govern the actions of persons or organizations in a way that they are consistent with requirements of forest sustainability (for example, rules promulgated in response to State forest practice laws); and *guidelines* — criteria, touchstones, or benchmarks (generally nonauthoritative) that give direction to conditions considered necessary for the sustainability of forests (for example, recommended best management practices). The latter, namely guidelines, may be incorrectly specified by the indicator in that guidelines in the United States are generally viewed as standards to be voluntarily complied with by landowners and timber harvesters (often in response to offers of fiscal and technical assistance). Confusing the issue is that “enforcement” is widely associated with laws and regulations that make certain actions mandatory whereas the term “incentives” is typically associated with guidelines.

Conceptual Background

Enforcement of favored conditions that will accomplish societal interest in the sustainability of forests requires a delicate balancing of public and private interests in forests. In the context of the enforcement of laws and rules, this balance becomes befitting when nearly everyone expects certain standards of sustainability to be applied (regardless of whether they agree with standards that are specified) and this expectation deters the actions of those who do not wish to comply. From the perspective of guideline enforcement, a balance occurs when landowners and timber harvesters respond to various forms of incentives by voluntarily following procedures and applying practices that also lead to conditions of sustainability. The balance between public and private interests in forests is fragile. So too is the political balance between laws and rules applied in response to fear versus the application of guidelines made in response to persuasive tactics that appeal to the ethics of forest stewardship and, ultimately, sustainable forestry. History is replete with examples of rancorous political battles that sought to define the appropriate balance between the two (Callicott 2000, Ellefson 2000).

Enforcement of laws, rules, and guidelines can take many forms. If the focus is on persuading actions focused on guidelines, the forest resources community has access to an enormous array of programs that represent Federal and State capacity to promote sustainability. They range from educational and technical assistance programs to fiscal and tax incentives, and from payment for use and development rights to legally binding arrangements for transferring property between owners. As for enforcement of actions by fear of punishment, the range of tools is equally wide. Penalties (for example, fines and incarceration) exist for violation of endangered species laws and failure to comply with regulatory rules being implemented by State air and water quality agencies. For example, in Arkansas it is “. . . unlawful to remove any trees growing below the normal high water mark on any river or stream . . . fine to be not more than \$1,000” (Environmental Law Institute 1998). Yet in other States (for example, Maine, Indiana, Missouri, Wisconsin), forestry laws require the withholding of a tax benefit (or recapture of taxes avoided) if agreed to forest management plans are violated, or they may, as an enforcement mechanism, condition receipt of cost-share monies on a landowner’s willingness to apply certain forestry practices. On Federal public lands, enforcement actions predicated on fear of a penalty is authorized by a variety of laws, regulations and administrative directives, including for violations involving timber harvest trespass, endangered species habitat violations, and unsafe and unhealthy worker conditions. In some situations, Federal agency administrative withdrawal (special designation with limitations on use) of unique resources located on public lands is also viewed as an enforcement action.

The complex jurisdictional conditions that surround the enforcement of laws and regulations and the promotion of guidelines can be especially challenging to those that attempt to map patterns of enforcement. The enforceable reach of a law, and who has responsibility for enforcing it, can be quite confusing since some resource conditions are a Federal responsibility (for example, wildlife habitat management on Federal lands) as well as a State responsibility (for example, State determination of harvest levels on Federal lands), while in other cases (for example, endangered species) responsibility rests primarily with the Federal Government. In yet other situations, Federal and State enforcement jurisdictions operate cooperatively on enforcement matters (educational and fiscal incentives, health and safety standards), while in others (for example, air quality standards, pesticide use standards) the Federal Government may again be the preeminent authority. Local units of government also have significant enforcement authority, especially on matters of land use (for example, zoning and subdividing property). These multifaceted jurisdictional issues have serious implications for charting the type and magnitude of enforcement actions that are capable of promoting forest sustainability.

Accomplishing a befitting review of enforcement activities and programs is also challenged by issues involving definitions. Especially difficult can be uncertainty regarding what constitutes a “violation” and what is an appropriate attendant “penalty.” Enforcing agencies seek clarity in both as do violators of the law, yet both prefer some latitude in the definition of an offense and the nature of the sanction(s) to be imposed.

Room for bargaining and negotiation may benefit both sides. In reality, however, statutory language may at times be sufficiently broad that confusion ensues and agencies have to seek direction from rulemaking processes or the opinions of courts. Statutory phrases like “prohibit waste disposal,” “forbid discharge of a pollutant,” or “enjoin pollutants from nonpoint sources” are good examples of statutory vagaries that can perplex enforcement. At the other extreme, the standards or thresholds of conduct stipulated in law may be so explicit that enforcing agencies have difficulty applying the standards to geographically diverse forest conditions or to the diversity of honorable intentions of landowners and timber harvesters. In this respect, forest practice regulatory rules are examples of particularly explicit specification of standards (for example, harvest operations cannot commence without an onsite inspection, trees over 24 inches in diameter cannot be harvested, riparian buffer strips must be 150 feet and pesticides will not be applied therein).

Current Institutional Capacity

Federal Government Capacity

Authorities and Programs

Federal agencies have substantial authority and institutional capacity to enforce laws regulations and guidelines that contain standards important to the sustainability of forests and related resources. For example, in administering the National Forest System “ . . . all persons employed in the Forest Service of the United States shall have authority to make arrests for the violation of the laws and regulations relating to the National Forests . . . ” (Public Law 58-138; Agricultural Appropriations Act of March 3, 1905). In furtherance of this authority, the agency is also authorized to cooperate with any State or political subdivision thereof in the enforcement of laws involving national forests (Cooperative Law Enforcement Act of 1971). Similarly, the USDI Bureau of Land Management is authorized to “ . . . institute a civil action for an injunction to prevent any person from utilizing public lands in violation of regulations . . . ” (Federal Land Policy and Management Act of 1976). The agency’s authority for enforcement includes the development of regulations regarding public land use, management, and protection; initiation of civil actions (by Attorney General) for violation of regulations, including nature of relief expected; contracts with law enforcement officials as necessary to enforce regulations; and cooperation with regulatory and law enforcement officials of any State or political subdivision. Similar enforcement authorities are granted to other Federal agencies (for example, USDI National Park Service, USDI Fish and Wildlife Service) as they seek to enforce the laws and regulations for which they are responsible (West Publishing Company

1997). Although extensive authority does exist, there is only a limited understanding of how such authorities relate in a comprehensive sense and the extent to which cooperation in enforcement matters actually occurs (American Forest and Paper Association 1994).

Enforcement authorities of Federal agencies can be exercised in a wide variety of ways. However, the most commonly referred to approach to securing enforcement of forest sustainability standards is by exercising authority to inspect, investigate, and impose fines and prison sentences. The mere existence of authority to impose fines or prison terms can significantly influence behavior regarding the adoption of forest sustainability standards. Information about such authorities and their application is modest. Of 7 Federal statutes focused directly and exclusively on forests, 2 grant authorities to impose fines while of 20 Federal laws that are more broadly focused on the environment and natural resources generally, 11 authorize fines and prison sentences for the noncompliance with statutory provisions (Table 1). Most statutorily authorized fines and imprisonment relate to fish and wildlife statutes, although archeological resources, human health and safety, and pesticide use and management are also a common enforcement focus (Table 2).

Table 1. Enforcement Action Authorized by Selected Federal Statutes Relevant to Forest Resources by Statute and Type of Enforcement Action, 2001 (Sources: Coggins and Wilkinson 1990, USDA Forest Service 1993, and West Publishing Company 1997.)

Federal Statute	Type of Actions Authorized to Compel Action or Enforcement				
	Specifies Fines and Prison Sentences to be Imposed	Authorizes Development of Rules to be Followed	Specifies Standards, Actions or Processes to be Followed	Authorizes Funds Required to Compel Action	Authorizes Education & Incentives to Compel Action
<u>Focus Directly and Exclusively on Forests and Forestry</u>					
Cooperative Forestry Assistance Act of 1978				X	X
Forest Conservation and Shortage Relief Act of 1990 (timber exports)	X	X	X	X	
Forest and Rangeland Renewable Resources Planning Act of 1974		X	X		
Multiple-Use Sustained Yield Act of 1960					
National Forest Management Act of 1978			X		
National Forest System Drug Control Act of 1986	X				X
Renewable Resource Extension Act of 1978		X	X		
<u>Focus Broad Based, Including (but not exclusive to) Forests and Forestry</u>					
Administrative Procedures Act of 1946		X	X		X
Archeological Resources Protection Act of 1979	X		X		X
Clean Air Act of 1990	X	X	X	X	X
Clean Water Act of 1987	X	X	X	X	X
Coastal Zone Management Act of 1972		X	X	X	X
Endangered Species Act of 1973	X	X	X	X	
Federal Insecticide, Fungicide, and Rodenticide Act (as amended 1996)	X	X	X	X	
Federal Land Policy and Management Act of 1976	X	X	X	X	
Federal Noxious Weed Act of 1974			X		
Fish and Wildlife Conservation Act of 1980		X	X	X	
National Environmental Policy Act of 1969			X	X	
National Trails System Act of 1968	X	X	X	X	X
National Wildlife Refuge System Administration Act of 1966 (1997)	X	X	X	X	
Occupational Safety and Health Act of 1970	X		X		
Public Lands U.S. Criminal Code of 1948			X	X	X
Soil and Water Conservation Act of 1977	X	X	X	X	
Solid Waste Disposal Act of 1986		X	X		
Surface Mining Control and Reclamation Act of 1977			X		
Wilderness Act of 1964			X	X	
Wild and Scenic Rivers Act of 1968					

Table 2. Penalties and Punishment Authorized by Federal Statutes Relevant to Forest Resources, 2001
 Sources: Coggins and Wilkinson 1990, Forest Service 1993, and West Publishing Company 1997.

Federal Statute	Penalties for Violations & Provision for Related Enforcement
Preservation of American Antiques Act of 1906	<ul style="list-style-type: none"> • Persons appropriating any object of antiquity on Federal Government lands subject to penalties of up to \$500 or up to 90 days (or both).
Migratory Bird Treaty Act of 1918	<ul style="list-style-type: none"> • Persons failing to comply with regulations regarding taking, killing, or possessing migratory birds subject to penalties up to \$500 or imprisoned up to 6 months (or both) (\$2,000 or 2 years [or both] for sale of birds)
Bald & Golden Eagle Protection Act of 1940	<ul style="list-style-type: none"> • Persons possessing or selling eagles subject to penalties of up to \$5,000 or imprisonment up to 1 year (or both) (second violation, \$10,000 and 2 years)
Federal Insecticide, Fungicide, & Rodenticide Act (amended)	<ul style="list-style-type: none"> • Persons failing to properly register or use pesticides subject to various penalties ranging from maximums of \$1,000 to \$25,000 and from maximums of 30 days to 3 years imprisonment
Public Lands U.S. Criminal Code of 1948	<ul style="list-style-type: none"> • Persons engaged (on Federal public lands) in timber trespass, tree injury, setting of wildfires, destruction of livestock fences, destruction of survey markers, and deception at land and timber sales subject to various penalties ranging from maximums of \$500 to \$3,000 and from maximums of 6 months to 3 years imprisonment.
Occupational Safety and Health Act of 1970	<ul style="list-style-type: none"> • Person violating safety and health rules subject to civil and criminal penalties ranging from maximum of \$7,000 to \$70,000 and 6 months imprisonment.
Endangered Species Act of 1973	<ul style="list-style-type: none"> • Persons engaged in knowingly (civil crime) or willfully (criminal crime) engaged in violations of endangered species law subject to various penalties ranging from maximums of \$500 to \$50,000 and from maximums of 6 months to 1 year imprisonment. Criminal violations also result in loss of any permits or leases authorizing use of Federal land.
Federal Noxious Weed Act of 1974	<ul style="list-style-type: none"> • Persons violating quarantine of noxious weeds or promoting their dissemination subject to penalties of up to \$5,000 or up to 1 year imprisonment (or both)
Federal Land Policy and Management Act of 1976	<ul style="list-style-type: none"> • Persons violating provision of Act regarding use and protection of public lands subject to penalties up to \$1,000 or up to 12 months imprisonment (or both)
Archeological Resources Protection Act of 1979	<ul style="list-style-type: none"> • Persons damaging, removing, or defacing archeological resource on Federal public lands subject to criminal penalties ranging from maximum of \$10,000 to \$100,000 and from maximum of 1 year to 5 years imprisonment. Civil penalties assigned by land manager.
Lacey Act Amendments of 1981 (wildlife)	<ul style="list-style-type: none"> • Persons importing, exporting, selling or purchasing wildlife in violation of Federal laws subject to civil and criminal penalties ranging from maximum of \$250 to \$20,000 and up to 5 years imprisonment.

Table 2. Penalties and Punishment Authorized by Federal Statutes Relevant to Forest Resources, 2001 (continued)

Federal Statute	Penalties for Violations & Provision for Related Enforcement
<p>Solid Waste Disposal Act of 1986</p> <p>National Forest System Drug Control Act of 1986</p> <p>Forest Resource Conservation and Shortage Relief Act of 1990 (timber exports)</p> <p>National Wildlife Refuge Administration Act of 1966</p>	<ul style="list-style-type: none"> • Persons or organizations violating compliance orders for management of hazardous wastes subject to civil and criminal penalties ranging from maximums of \$25,000 to \$1,000,000 and from 2 to 15 years imprisonment. • Persons acting to harm Federal officials or Federal property subject to penalties ranging from maximums of \$10,000 to \$20,000 and from maximum of 10 to 20 years imprisonment. Special enforcement powers assigned to Forest Service employees (carry firearms, make arrests) • Persons illegally exporting unprocessed Federal timber subject to penalties ranging from maximum of \$75,000 to \$500,000. Violators may be barred from purchasing Federal timber for up to 5 years. • Persons violating Act's provisions subject to fines prescribed by Title 18 U.S.C. and/or up to 1 year imprisonment.

Table 3. Final Rules Issued by Federal Natural Resource Agencies by Agency, 1997–2001

Agency	Year				
	1997	1998	1999	2000	2001
USDA Forest Service	6	10	9	5	13
USDA Natural Resource Conservation Service	3	1	1	2	0
USDI Bureau of Land Management	13	14	5	6	10
USDI Fish and Wildlife Service	54	57	56	63	52
USDI National Park Service	5	2	5	4	3

Note: Information for 2001 is for January through October 2001.

Source: National Archives and Records Administration 2001a.

Table 4. Presidential Executive Orders Representing Enforcement Actions Relevant to Forest and Related Resources, 1961–2000

<ul style="list-style-type: none"> • Greening Government through Environmental Management Leadership (EO 13148; 2000) • Invasive Species Federal Action Directive (authorities addressing invasive species) (EO 13112; 1999) • Federal Interagency Partnership on Lake Tahoe Ecosystem (establishment of . . .)(EO 13057; 1997) • Federal Agency Standards for Content of Recycled Paper (EO 12995; 1996) • Management and Use of National Wildlife Refuge System (EO 12996; 1996) • International Union for Conservation of Nature & Natural Resources (legal immunity) (EO 12986; 1996) • Commission on Environmental Cooperation (establishment of . . .)(EO 12904; 1994) • Advisory Committee on Trade and the Environment (establishment of . . .)(EO-12905; 1994) • Environmental Cooperation Agreement (enforce NAFTA) (EO 12915; 1994) • President’s Council on Sustainable Development (establishment of . . .)(EO-12852; 1993) • Grazing Fee on Federal Lands (establish rates for . . .) (EO 12548; 1986) • President’s Commission on Americans’ Outdoors (establishment of . . .) (EO 12503; 1985) • Commission on Indian Reservation Economies (establishment of . . .) (EO 12401; 1983) • Animal Damage Control on Federal Lands (environmental safeguards for . . .) (EO 12342; 1982) • Environmental Effects Abroad of Major Federal Actions (specify conditions of . . .) (EO 12114; 1979) • Environmental Evaluation Functions (transfer of certain Federal responsibilities)(EO 12040; 1978) • Off-Road Vehicle Use on Federal Public Lands (establish conditions for . . .) (EO 11989; 1977) • Protection of Wetlands (establish responsibility and standards for . . .) (EO 11990; 1977) • Protection and Enhancement of Environmental Quality (EO 11991; 1977) • Preservation of Endangered Species (establish responsibility and standards for . . .)(EO 15683; 1976) • Animal Damage Control on Federal Lands (environmental safeguards for . . .)(EO 11643; 1972) • National forests in Illinois, Michigan Missouri and Wisconsin (boundary of . . .) (EO 10932; 1961)

Source: National Archives and Records Administration 2001b.

Agency promulgated rules and regulations are also enforcement tools in that they establish standards of conduct which command respect and exert influence upon behavior (Kerwin 1999). Influencing both the substance of sustainable forestry and the processes by which such is accomplished, rules and regulations are extremely common enforcement mechanisms among Federal natural resource

agencies. Especially notable in this respect have been rules and rulemaking efforts involving the implementation of the National Forest Management Act of 1976, Endangered Species Act of 1973 and the Federal Land Policy and Management Act of 1976. During the 5-year period beginning in 1997, 4 Federal agencies issued nearly 400 final rules deemed necessary for guiding the actions of other Federal agencies and of a significant portion of the public that has an interest in forest and related resources (Table 3). Rules issued by the USDI Fish and Wildlife Service accounted for the vast majority of these final rules (most required to implement the Endangered Species Act of 1973). Similar in many respects to rules, Presidential Executive Orders also serve as enforcement mechanisms in that they command respect and ultimately coerce compliance with desired policy and program directions (Table 4).

Enforcement can also be exercised in a number of additional ways. Unfortunately, information describing this Federal institutional capacity is usually scattered, inconsistent, and in many cases, nonexistent. For example, few if any compilations or analyses have been made of enforcement actions involving injunctive relief imposed by Federal courts in response to civil violations identified by Federal agencies. At best, there have been modest efforts to determine the frequency and disposition of Federal cases generally involving environmental and natural statutes (Alden and Ellefson 1997, Jones and Taylor 1995, Wasby 1983) (Table 5). Similarly, there has been but modest attention to agency administrative withdrawal of certain Federal public lands as a means of protecting them from alleged or real deleterious uses and management practices (U.S. General Accounting Office 1995); agency pre and post review of permits to be granted by authority of environmental and natural resource statutes (for example, timber harvest, mineral extraction, access to private property); actual or threatened suspension of financial payments if compliance with plans, management directives, or sustainability standards are not met (for example, failure of State government to adhere to certain provisions of the Coastal Zone Management Act of 1972) (West Publishing Company 1997); agency acquisition (primarily from nonprofit organizations) of certain private lands or resources considered in to be in jeopardy (U.S. General Accounting Office 1994); and enforcement of public interest in forest sustainability by moral persuasion that is promoted through an assortment of fiscal and tax incentives and the extending of information and technical assistance. Federal statutory capacity for this persuasive approach is extensive (Table 6).

Table 5. Environmental and Natural Resource Statutes Subject to Litigation in Federal District and Appellate Courts by Major Federal Statutory Category and Number of Cases, 1980–1990

Federal Statute Category and Law	Cases	
	Number	Percent
<i>Fish and Wildlife Laws</i>		
Endangered Species Act of 1973	57	90
Fish and Wildlife Coordination Act of 1934	2	3
Migratory Bird Treaty Act of 1918	1	2
National Wildlife Refuge System Administration Act of 1966	1	2
Wild Horses and Burros Protection Act of 1971	2	3
Total Fish and Wildlife Cases	63	100
<i>Waste and Pollution Prevention Laws</i>		
Federal Insecticide, Fungicide and Rodenticide Act (amended 1996)	1	2
Noise Control Act of 1972	4	8
Rivers and Harbors Act of 1889 (as amended)	27	56
Solid Waste Disposal Act of 1965	5	11
Surface Mining and Reclamation Act of 1977	6	12
Toxic Substances Control Act of 1989	5	11
Total Waste and Pollution Cases	48	100
<i>Planning, Land Use and Management Laws</i>		
Coastal Zone Management Act of 1972	10	13
Forest and Rangeland Renewable Resources Planning Act of 1974	1	2
Historic Preservation Act of 1966	8	11
Federal Land Policy and Management Act of 1976	11	14
Minerals Leasing Act of 1920	2	3
Multiple-Use Sustained Yield Act of 1960	4	5
National Environmental Policy Act of 1969	37	49
Taylor Grazing Act of 1934	2	3
Total Land Use and Management Cases	75	100
Total All Cases	186	—

Source: Alden and Ellefson 1997.

Enforcement Magnitude

Information describing the magnitude of Federal agency institutional capacity focused on enforcement actions is especially lacking. Such has simply not been assembled in a comprehensive sense whereby analyses could be performed to determine whether legal and institutional conditions are promoting standards of sustainability for natural resources, including forest resources. The following examples describing Federal agency enforcement efforts will have to suffice, although much of the information is not exclusive to forestry and forest resource matters.

The USDI Bureau of Land Management (responsible for 264 million acres of Federal public land) implements a law enforcement program involving approximately 200 law enforcement officers, some of whom patrol areas as large as 1.8 million acres. Enforcement activities focus on a wide array of illegal activities involving timber, oil and gas trespass, mineral theft and fraud, cultural resource vandalism and theft, unlawful land occupancy, recreational site violations, illegal hazardous waste dumping, wrongful use of off-road vehicles, and various drug enforcement activities. The matter of enforcement is especially critical for formally-designated special places on Federal public lands, of which more than 3,000 have been so identified. The agency's 1998 budget request for resource protection and law enforcement was nearly \$16 million. In 1996, enforcement actions involved and estimated 7,200 felonies and misdemeanors and 4,700 natural resource violations (USDI Bureau of Land Management 2001).

The USDI National Park Service (responsible for 84 million acres of Federal public land; 288 million visitors in 2001) invested in 2001 (FY) more than \$196 million in law enforcement of which \$140 million was invested in enforcement related to resource protection (vandalism, archeological safeguards) and ranger law enforcement (search and rescue, vehicle violations). Since 1996, the portion of the agency's enforcement budget devoted to these two major activities has remained about the same (33 percent and 67 percent, respectively). In 2001 (FY), the actual law enforcement and protection workload was as follows (such information is available for previous years): law enforcement incidents — 85,300, natural resource incidents (violations) — 18,800, search and rescue incidents — 4,200, emergency medical incidents — 13,700, archeological protection incidents — 320, vandalism incidents — 3,300, and resource incidents — 19,800. The agency's enforcement activities are facilitated by a computer-based clearing house of information on archeological looting and vandalism (called LOOT or Listing of Outlaw Treachery). Between 1985 and 1987, 1,620 incidents were reported by Federal agencies, leading to 134 citations, 49 arrests, 57 criminal convictions, 16 felony convictions, and 17 civil penalties (Carnett 1991, USDI National Park Service 2001).

Table 6. Federal Fiscal and Education Programs Promoting or Evoking Actions Important to the Sustainability of Forests by Program Focus and Administering Agency, 2001

Federal Statute or Program	Principal Administering Agency	Program Focus
National Environmental Education Act of 1990	U.S. Environmental Protection Agency	Environmental education, grants, internships and awards
Conservation Reserve Program (Farm Bill 1995)	U.S. Department of Agriculture (Farm Service Agency)	Educational and financial assistance to reduce soil erosion
Cooperative Forestry Assistance Act of 1978 (Forestry Incentives, Forest Stewardship, Stewardship Incentives, Forest Legacy)	U.S. Department of Agriculture (Forest Service)	Technical and financial assistance and land protection via easements
Fish and Wildlife Conservation Act of 1980	U.S. Department of Interior (Fish and Wildlife Service)	Technical and financial assistance for planning
Reforestation Tax Incentives (Recreational Boating Safety and Facilities Improvement Act of 1980)	Internal Revenue Service and U.S. Department of Agriculture (Forest Service)	Reforestation tax incentive, investment tax credit, reforestation trust fund
Renewable Resources Extension Act of 1978	U.S. Department of Agriculture (Cooperative State Research, Education and Extension Service)	Education and technical assistance
Clarke-McNary Act of 1924	U.S. Department of Agriculture	Education and technical assistance
Wildlife Habitat Incentives Program (Federal Agricultural Improvement and Reform Act of 1996)	U.S. Department of Agriculture (Natural Resource Conservation Service)	Financial incentives for wildlife habitat improvement
Environmental Quality Incentives Program (Farm Bill 1996)	U.S. Department of Agriculture (Natural Resource Conservation Service)	Educational, financial and technical assistance for conservation activities

Source: Forest Service 1993, West Publishing Company 1997, and various agency documents describing programs and statutory authority.

The USDI Fish and Wildlife Service law enforcement program addresses a wide variety of illegal activities both domestically and internationally. Authority for doing so stems from 14 different laws and several treaties specific to certain wildlife and plants. Information identifying enforcement actions that directly and exclusively involve forests is limited, although certain actions clearly have relevance to forests and forestry. Examples are pursuing habitat destruction cases, promoting and enforcing habitat conservation plans under the Endangered Species Act of 1973, investigating domestic crimes involving federally protected species, monitoring and regulating unlawful trade in domestic Wildlife, and investigating environmental hazards and contaminants that pose a special threat to wildlife. The agency's 2000 case load involving forestry or closely related matters is as follows: archeological destruction — 6 cases, eagle protection infractions — 120 cases, endangered species violations — 4,101 cases, national wildlife refuge trespass — 228 cases, and wild bird conservation violations — 64 cases. With a budget of nearly 50 million, the agency in 2001 employed 253 agents, 94 wildlife inspectors, and a staff of wildlife forensics scientists. Information identifying the portion of the agency's law enforcement budget and personnel that are devoted specifically to matters involving forests is not available (USDI Fish and Wildlife Service 2001).

The Forest Service enforcement program focuses on curbing a variety of illegal activities (for example, arson, theft, vandalism, and use of controlled substances) that occur primarily in the National Forest System. To assist in this respect, the agency has established the Law Enforcement Management Reporting System (LEMARS), a data retrieval system that provides management with a means of identifying and following law enforcement activities. The system is designed to consistently and accurately document information on violations occurring within the National Forest System, by type, location, resources damaged, and estimated property loss. Law enforcement incidents and violations on the national forests have risen substantially in recent years, going from about 144,000 in 1996 to more than 285,000 in 2000 (Forest Service. 2000). Timber trespass incidents on the national forests in 1994 totaled 143,232 (1992 – 114,328, 1993 – 111,512) with closely related incidents numbering 8,209 in the same year (1992 – 5,414, 1993 – 6,168). The agency's law enforcement budget in 1998 was \$64.0 million, an increase of nearly 700 percent more than 1992 investments (\$8.3 million). The agency conducts law enforcement investigation with a staff of about 450 professionals that are assigned to the agency's regional administrative centers and to the National Headquarters in Washington, DC (Forest Service Law Enforcement and Investigations [LEI]) (administration and systems, enforcement and liaison, investigations and internal affairs, and training and development) (Forest Service 2001a).

State Government Enforcement

Authorities and Agencies

States have substantial institutional capacity to enforce laws, regulations, and guidelines that will further the application of standards essential for forest sustainability. The programmatic expression of this capacity is quite diverse, as is the timeliness and availability of information capable of describing such capacity. An assessment in 1992 found that many States had programs promoting State-adopted best forest practices, programs that focused on a wide variety of forest benefits (for example, water quality, reforestation, timber harvesting, forest protection, wildlife protection, and recreation and aesthetic qualities). Eleven percent of these best practices were enforced by regulatory means, with such an approach being most commonly applied to activities involving water quality, wildlife and endangered species, and wildfire, insects, and diseases (Table 7). Other State programs included technical assistance (28 percent of applications), education and extension (27 percent), fiscal incentives (15 percent), voluntary guidelines (13 percent), and tax incentives (6 percent) (Ellefson and others 1995).

State laws authorizing enforcement action focused on nonpoint forest sources of water pollution have been periodically compiled. These authorities exist as both comprehensive State water pollution control laws and as well as State forest practices laws focused specifically on nonpoint sources of pollutant. In this respect, nearly all States have the former while slightly more than 30 States have forest laws that grant legal authority to enforce application of water-pollution prevention activities (Table 8). Further evidence of institutional enforcement capacity regarding nonpoint pollutants has been gathered by the National Association of State Foresters (2001). In 2000, 21 percent of States used only voluntary programs to promote forestry best management practices on private forests, 35 percent used voluntary programs plus a backup enforcement penalty for failure to willingly apply best management practices (commonly known as a “bad actor” or “contingency” law), 27 percent used only regulatory programs for enforcement, and 17 States used some combination of all three approaches. As for the forest practice focus of legal enforcement authority, the following frequency exists: forest practice standards generally — laws in 11 States; lake and stream protection standards — laws in 27 States; wetland protection standards — 23 States; stream crossing standards — laws in 23 States; sediment and erosion control standards — 29 States; chemical application standards — laws in 15 States; storm water discharge standards — laws in 10 States; and laws authorizing actions against especially troublesome (bad actor laws) landowners and timber harvesters — laws in 12 States.

Table 7. State Government Programs Promoting Best Forest Practice Standards on Private Forests by Forestry Activity, Region, and Type of Program, 1992

Major Forestry Activity and Type of Program	Number of States in Region Having Program Type									
	North-east	Lake States	Mid-Atlantic	Mid-Continent	South-East	South Central	Great Plains	Rocky Mountain	West	Total
Protect Water Quality										
Educational Programs	6	3	6	5	5	5	5	5	6	46
Technical Assistance	6	3	7	5	5	5	5	6	5	47
Voluntary Guidelines	5	3	6	4	5	5	1	4	1	34
Tax Incentives	1	1	4	3	0	1	3	1	0	14
Fiscal Incentives	2	3	5	3	1	4	5	4	2	29
Regulatory Programs	6	1	5	1	4	1	0	2	6	26
Promote Reforestation										
Educational Programs	6	3	6	5	6	5	4	5	6	46
Technical Assistance	6	3	6	5	6	5	5	6	4	46
Voluntary Guidelines	1	1	3	2	1	1	1	4	1	15
Tax Incentives	2	3	3	3	1	1	0	1	2	16
Fiscal Incentives	5	2	5	3	4	5	5	5	3	39
Regulatory Programs	3	0	4	0	0	0	0	1	6	14
Improve Timber Harvesting Methods										
Educational Programs	6	3	6	5	5	4	5	5	6	45
Technical Assistance	6	3	7	5	6	5	5	6	4	47
Voluntary Guidelines	4	2	6	1	3	3	2	4	2	27
Tax Incentives	2	2	3	1	0	1	0	0	0	9
Fiscal Incentives	3	0	4	0	0	1	2	2	1	13
Regulatory Programs	4	0	4	0	1	1	0	1	6	16
Protect from Wildfire, Insects and Diseases										
Educational Programs	6	3	6	5	5	5	5	6	6	47
Technical Assistance	6	3	7	4	6	5	4	6	6	48
Voluntary Guidelines	3	0	3	1	2	3	2	4	2	20
Tax Incentives	0	1	3	2	0	0	0	0	0	6
Fiscal Incentives	1	1	4	2	1	0	2	4	2	17
Regulatory Programs	5	2	3	1	3	2	1	4	6	27
Protect Wildlife & Endangered Species										
Educational Programs	6	3	7	5	6	5	4	5	5	46
Technical Assistance	5	3	6	5	6	5	5	5	4	45
Voluntary Guidelines	4	1	3	1	1	2	2	2	2	18
Tax Incentives	0	0	1	2	0	0	0	0	0	3
Fiscal Incentives	3	2	5	3	2	4	5	2	2	28
Regulatory Programs	4	2	2	0	3	1	1	2	5	20
Enhance Recreation & Aesthetic Qualities										
Educational Programs	6	3	6	4	5	5	4	5	3	42
Technical Assistance	6	3	7	5	5	5	5	6	3	45
Voluntary Guidelines	3	1	2	1	1	2	2	2	2	16
Tax Incentives	1	1	1	2	0	1	0	1	1	8
Fiscal Incentives	4	1	6	2	2	4	2	3	1	25
Regulatory Programs	2	0	1	0	0	0	0	0	5	8

Note: Regional groupings of States are Northeast -- CT, ME, MA, NH, RI, VT; Lake States -- MI, MN, WI; Mid-Atlantic -- DE, MD, NJ, NY, PA, VA, WV; Mid-Continent -- IL, IN, KT, MO, OH; Southeast -- AL, FL, GA, MS, NC, SC; South Central -- AR, LA, OK, TN, TX; Great Plains -- IA, KS, NB, ND, SD; Rocky Mountain -- AZ, CO, MT, NM, UT, WY; West -- AK, CA, HI, ID, NV, OR, WA.
 Source: Ellefson and others 1995.

Table 8. Provisions of Major Enforceable State Laws to Control Nonpoint Source Water Pollution by State, Water Pollution Law, and Requirements for Forestry, 2001

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Alabama	Water pollution control law requires a permit for discharge of water pollutants, although excluded are certain nonpoint source discharges from agriculture and silviculture from the permit requirement. State may directly enforce against nonpoint sources, if they cause violation of water quality standards or to deal with any type of water pollution resulting from negligence or that produces a health hazard. Attorney general may commence a civil enforcement action for damages for pollution of the waters of the State. Enforcement may include includes orders, injunctions, civil actions for damages for pollution (recover reasonable costs to prevent, minimize, or clean up any damage), costs for restocking of fish killed, civil penalties of \$100 to \$25,000 per day, and criminal penalties for willful violation or grossly negligent violations.	Forestry Commission has power to adopt and promulgate rules and regulations pertaining to all phases of forestry. However, for enforcement the Commission relies on voluntary BMPs, licensing requirements for foresters, and the State's water pollution control act. State law authorizes soil and water conservation districts to "formulate regulations governing the use of lands within the district in the interest of conserving soil and soil resources and preventing and controlling soil erosion." "Any management guidelines developed by watershed management authorities [a special form of authority within some soil and water conservation districts] to protect forested watersheds shall follow the best management practices established by the Forestry Commission." Enforcement of district land use regulations is by injunction ordered by circuit courts or by districts performing need corrections and subsequent recovery of expenses.
Alaska	Water pollution control law prohibits persons from "pollut[ing] or add[ing] to the pollution of the air, land, subsurface land, or water of the State." The Alaska Department of Environmental Conservation (DEC) has broad authority to adopt pollution standards and "to determine what qualities and properties of water indicate a polluted condition . . ." "If an activity presents "an imminent or present danger" to the people of the State or would result in or be likely to result in "irreversible or irreparable damage" to the environment, the DEC may issue an emergency abatement order without a hearing. Superior court may also enjoin violations of statute, regulations, orders or permits and impose sanctions including civil penalties of between \$500 and \$10,000 for the initial violation and not more than \$5000 for each subsequent day of the violation. If a violation occurs with criminal negligence, it is considered a misdemeanor.	Commissioner of Natural Resources may issue nonpoint source pollution regulations subject to Department of Environmental Conservation approval. On State, municipal, and private forest land, State law provides that "environmentally sensitive areas" shall be recognized "in the development of regulations and best management practices that are designed to implement nonpoint source pollution control measures. Before beginning forestry operations on private or State public forest land, the operator must submit to the Director of the State Division of Forestry a "detailed plan of operations." Unless a stop-work order is issued or the agency extends the review period, the operator may commence work, at the latest, thirty days after submission of the plan. The plan must be renewed annually. Director may issue orders to cease violations of plan or to repair any resulting damage. Violation of statute, regulation, directive or stop-work order can result in a maximum civil fine of \$10,000, or, if criminal negligence is found, charges of a misdemeanor. Repairs may proceed with the violator liable for their cost.
Arizona	Water pollution law authorizes development of programs for nonpoint source discharges, which may include, but does not require, development of enforceable mechanisms. However, the Department of Environmental Quality (DEQ) is required to adopt a "program to control nonpoint source discharges of any pollutant or combination of pollutants into navigable waters." Thus, enforceable mechanisms could be created by regulation.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Arkansas	Water pollution control law establishes a general discharge prohibition that may be used to take enforcement against nonpoint source discharges, namely unlawful to "cause pollution . . . of any of the waters of this State," or to "place or cause to be placed any sewage, industrial waste, or other wastes in a location where it is likely to cause pollution of any waters of this State." Pollution and Ecology Commission is the responsible enforcement agency and is authorized to conduct investigations, administrative proceedings, and institute civil enforcement actions in the proper court. Administrative penalties may be no greater than \$10,000 per day of violation; civil actions may result in penalties not over \$10,000 per day of violation, an order to enjoin violations and/or compel compliance, an order for remedial measures, and recovery of all costs, expenses, and damages. Violations may also be a criminal misdemeanors punishable by imprisonment for not more than one year, a fine of not more than \$25,000, or both. Purposeful, knowing, or reckless violations adversely affecting human health or the environment is a felony, punishable by imprisonment	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities. However, there is a restriction on tree-cutting near river beds, namely "it is unlawful to remove any trees growing below the normal high watermark on any river or stream which has been designated as a navigable river or stream." Violators are subject to a fine of not less than ten dollars (\$10.00) nor more than one thousand dollars (\$1,000).

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
California	<p>Water pollution control law (Porter-Cologne Act) establishes enforceable permitting provisions and empowers regional water quality control boards to order the abatement of nonpoint source discharges. Timber harvesting operations conducted under the State's forest practice's act are exempt from the waste discharge requirements if the law's requirements are certified as best management practices by the U.S. Environmental Protection Agency. Enforcement of pollution control law is by order, injunction, or remedial action with cost recovery. Other sections of the law provide for civil penalties, injunctions, misdemeanor prosecutions, and administrative orders.</p>	<p>State's forest practices law addresses nonpoint source pollution in the operating context of forestry practices and timber harvesting activities. Law divides the State into three districts (coast forest, northern forest, southern forest) with distinct rules established by the State Board of Forestry. Rules must "protect the soil, air, fish, and wildlife, and water resources, including, but not limited to, streams, lakes, and estuaries," and must include measures for "soil erosion control, for site preparation that involves disturbance of soil or burning of vegetation following timber harvesting activities . . . , for water quality and watershed control, for flood control . . . [etc]." Rules are implemented through requirements for licensing of foresters and for filing and approval of timber harvest plans, "... no person shall conduct timber operations unless a timber harvesting plan prepared by a registered professional forester has been submitted for such operations to the Department of Forestry." Law provides for public comments and review of proposed plans by other agencies. Reports of completion of work must be filed within one month after completion of the activity described in the plan, and operations must be inspected within six months. Enforcement measures include license actions, misdemeanor prosecutions (with fines of not more than \$1000 per day nor imprisonment for more than six months), civil injunction actions, and departmental corrective actions with cost recoveries. Although local government regulation of forestry is largely preempted, the California Tahoe Regional Planning Agency may adopt rules that are stricter than those promulgated by the Board of Forestry.</p>
Colorado	<p>Water pollution control law establishes a general policy declaration favoring the prevention of discharge of untreated pollutants. However, the law does not have a general enforceable prohibition that directly applies to nonpoint sources. Instead, the law confers authority on the Water Quality Control Commission to adopt regulations which may include nonpoint source regulations. The law specifically requires the use of nonregulatory mechanisms before regulatory approaches may be used.</p>	<p>Board of Agriculture has the power and duty "to foster and promote the control of soil erosion on . . . forest lands." State law does not appear to specify operational enforcement requirements related to nonpoint source water pollution from forestry activities.</p>
Connecticut	<p>Water pollution control law makes it a violation to discharge any substance to the waters of the State without a permit, namely ". . . no person or municipality shall initiate, create, originate, or maintain any discharge of water, substance or material into the waters of the State without a permit for such discharge issued by the Commissioner of Environmental Protection." "Discharge" means "the emission of any water, substance or material into the waters of the State, whether or not such substance causes pollution." In such a context, discharge is not limited to point sources. In setting standards for permits, the Commissioner must consider "best management practices," namely practices which reduce the discharge of waste into the waters of the State and which have been determined to be acceptable based on technical, economic and institutional feasibility. Enforcement authorities include orders prohibiting or abating pollution and orders to correct potential sources of pollution. Civil penalties are available up to \$25,000 per day. Criminal actions may be brought for willful violations with a sanction of up to \$25,000 per day and/or one year.</p>	<p>State forestry law requires any person engaged in commercial forest practices to obtain and maintain a State certificate in one of three categories, namely forester, supervising forest products harvester, and forest products harvester. Certified foresters, supervisors, and harvesters are required to file annual reports of their activities and continuing education. The certification process provides a basis for assuring that forest practices are conducted in accordance with forest practice rules addressing nonpoint source water pollution. State law authorizes the Commissioner of Environmental Protection to adopt regulations "governing the conduct of forest practices including, but not limited to, the harvest of commercial forest products . . . such regulations shall provide for a comprehensive statewide system of forest practices regulations which will . . . afford protection to and improvement of air and water quality . . ." The law also authorizes municipalities to regulate forest practices in a manner consistent with the State law; they must be approved by the Commissioner. Enforcement tools include civil penalties of up to \$5,000 per day per offense, compliance orders, injunctions, and denial, suspension, or revocation of a certificate.</p>

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Delaware	<p>Water pollution control law requires “. . . no person shall, without first having obtained a permit from the Department of Natural Resources and Environmental Control, undertake any activity that may cause or contribute to discharge of a pollutant into any surface or groundwater . . .” The adopted permitting regulations are aimed at point sources, but the State also can use this statutory authority to deal with nonpoint source pollution events. Numerous nonpoint activities do not require a permit (for example, activities involving drainage ditches; uncontaminated stormwater discharges; application of fertilizer; plowing or cultivating for agricultural or horticultural purposes; irrigation; movement of earth for building excavations). Enforcement includes civil penalties, orders, and injunctions.</p>	<p>State’s forestry administrator “shall provide for the protection of the waters of the State from pollution by sediment deposits resulting from silvicultural activities.” A special order may be issued by the administrator determines that an owner or operator is conducting any silvicultural activity in a manner which is causing or is likely to cause alteration of physical, chemical or biological properties of any State water, resulting from sediment deposition presenting an imminent and substantial danger to public health, safety or welfare, or recreational, commercial, industrial, agricultural or other reasonable uses. The order may direct the owner or operator “to cease immediately all or part of the silvicultural activities on the site and to implement specified corrective measures within a stated period of time.” Special orders are issued after notice and hearing and are effective not less than five days after service, except for emergency special orders which may be issued immediately. Failure to comply can lead to civil penalties of \$200 to \$2,000 per violation per day, although intentional and knowing violations of orders are subject to fines of \$500 to \$10,000 per violation per day.</p>
Florida	<p>Water pollution control law administered by the Department of Environmental Protection (DEP) prohibits any person “. . . to cause water pollution so as to harm or injure human health or welfare, animal, plant, or aquatic life or property.” Also a violation of State law is failure to obtain a permit required by law, rule or regulation adopted to prevent such pollution. Additional and separate State law provides water pollution prevention enforcement authority for Florida’s five water management districts (WMDs). DEP enforcement powers include civil actions for damages; actions for civil penalties up to \$10,000 per day; administrative actions for damages; and administrative orders for abatement or other corrective action, subject to administrative hearings. The law also provides for injunctions and for criminal prosecution for violations committed with intent.</p>	<p>State relies on voluntary BMPs; enforcement, if necessary, is under the state’s water pollution discharge laws (above). Where applicable, persons engaging in forest harvest operations must file a “notice of a general permit” with a Water Management District.</p>
Georgia	<p>Water pollution control law authorizes a permit program to control nonpoint sources that may impair water quality, namely law requires a permit for anyone seeking to “erect or modify facilities or commence or alter an operation of any type which will result in the discharge of pollutants from a nonpoint source into the waters of the State, which will render or is likely to render such waters harmful to the public . . .” Regulations limit this in that permits are required only if the State’s Environmental Protection Division (EPD) “has issued one to the same person for a point source discharge.” Injunctive relief and civil penalties of up to \$50,000 per day are provided for, as are criminal penalties of \$2,500 to \$25,000 and/or imprisonment.</p>	<p>State forestry laws do not appear to contain enforceable provisions relating directly to nonpoint source pollution. However, state does require registration of professional foresters, with continuing education and re licensing. Forest practices for hire must be conducted by a professional forester. Enforcement of licensing requirements includes injunction, license revocation, and misdemeanor prosecution.</p>
Hawaii	<p>Water pollution control law includes some provisions that may be used to take enforcement action against nonpoint source discharges that are not permitted or that result in water quality violations. Administrative and civil (up to \$10,000 for each offense) penalties are authorized. Criminal sanctions are more stringent if the violation was “knowing” rather than “negligent.”</p>	<p>State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.</p>

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Idaho	Water pollution control law provides that "no person shall conduct a new or substantially modify an existing nonpoint source activity that can reasonably be expected to lower the water quality of an outstanding resource, except where the nonpoint source activities are temporary or short-term and do not alter the essential character of a stream segment." Prior agency approval is required to conduct any new nonpoint source activities affecting such waters. Where total maximum daily loads (TMDLs) are required, the state must develop "pollution control strategies for both point sources and nonpoint sources for reducing those sources of pollution." If a person fails to obtain new nonpoint source approval in those few instances where it is required (outstanding resource waters), or fails to implement BMPs and violations of water quality result, the state may institute a civil action. Nonpoint source activities not conducted according to BMPs may be subject to compliance schedules, administrative and civil relief including injunctive relief.	State forestry law requires the Forest Board to "develop methods for controlling watershed impacts resulting from cumulative effects" of forest practices. Under the Idaho Forestry Act ("Act"), a BMP is defined as practices that the Forest Board determines to be the "most effective and practicable means of preventing or reducing the amount of nonpoint pollution generated by forest practices," and the rules under the Act establish site-specific BMPs for stream segments of concern. If implementation of BMPs is insufficient to protect beneficial uses, the forest activity may be deemed "an imminent or substantial threat." Operators are required to post a notice of intent to engage in forestry practices; a bond is required where an operator has failed to apply BMPs or willfully caused degradation of water resources. Rules are enforced through issuance of notice of violation and cease and repair orders. Relevant sanctions include suits for reparations, attachment of liens, bond forfeiture and injunctive relief. The Right to Conduct Forest Practices Act limits the circumstances under which forest practices may be deemed a nuisance.
Illinois	Water pollution control law provides that "No person shall cause or threaten or allow the discharge of any contaminants that would cause or tend to cause water pollution, or that would violate regulations or standards . . ." Enforcement occurs by injunction, mandamus, or other appropriate remedy and/or civil penalties. Civil penalties of a maximum of \$50,000 for the violation and \$10,000 for each continuing day may be assessed.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Indiana	Water pollution control law provides that "A person may not: (1) throw, run, drain, or otherwise dispose into any of the streams or waters of Indiana; or (2) cause, permit, or suffer to be thrown, run, drained, allowed to seep, or otherwise disposed into any waters; any organic or inorganic matter that causes or contributes to a polluted condition of any waters, as determined by rule . . ." Water Pollution Control Board can establish requirements for permits "to control or limit the discharge of contaminants into state waters"; while this is not limited to point sources, the current regulations cover permitting for point sources and do not require permits for "any introduction of pollutants from nonpoint source agricultural and silvicultural activities." Laws are enforced by administrative order, civil penalties of up to \$25,000 per day, and injunctions. Failure to comply with an order or is a misdemeanor.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Iowa	Water pollution control law contains a general prohibition against unpermitted discharges of pollutants (defined as "wastes") into waters, which may be used to reach some types of nonpoint source discharges. Enforcement is through cease and desist orders, civil penalties up to \$5,000 per day, injunctions, and criminal (serious or aggravated misdemeanor) prosecution. Cities and counties are authorized to assess a civil penalty equal in an amount to the penalty assessed by the State.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Kansas	Water pollution control law provides for enforceable permitting provisions that may be applied to nonpoint source discharges, namely "No person shall place or permit to be placed or discharge or permit to flow into any of the waters of the State any pollutants, except pursuant to a permit." Enforcement of these provisions is by corrective action orders, civil penalties of up to \$10,000 and criminal prosecutions.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Kentucky	<p>Water pollution control law may be enforced against nonpoint source discharges that pollute State waters in violation of applicable standards or regulations, namely "No person shall, directly or indirectly, throw, drain, run or otherwise discharge into any of the waters of the Commonwealth . . . any pollutant in contravention of the standards adopted by . . . rule, regulation, permit or order or any provision of the statute." The Natural Resources and Environmental Protection Office or the Attorney General may institute an action to recover penalties or bring an action seeking an injunction. Violators are subject to a civil penalty not to exceed \$25,000 per day for each violation. Knowing violations are a felony punishable by a fine not to exceed \$25,000, imprisonment of one to 5 years, or both.</p>	<p>State Forest Conservation Act (1998) establishes enforceable mechanisms applicable to commercial timber harvesting, including no person shall conduct commercial timber harvesting operations unless a certified "master logger" is on site who has completed certain educational requirements (including continuing education every 3 years). Timber harvesting operations must use appropriate best management practices (BMPs) which are defined by the State's Division of Forestry, approved by the Agriculture Water Quality Authority, and reviewed by the Forestry Best Management Practices Board. If a logger or operator fails to use appropriate BMPs or is causing water pollution, a written warning is issued and/or a conference with district foresters. Continued failure to comply can result in issuances of a special order mandating immediate implementation of the corrective measures or cessation of all or a portion of the timber harvesting operation. Subsequent failure to continue noncompliance may result in logger or operator being deemed a "bad actor" and subject to civil penalties of up to \$1,000. Agriculture Water Quality Act also establishes enforceable best management practices (BMPs) that apply to farm operations of ten or more acres, including silviculture conducted on such operations.</p>
Louisiana	<p>Water pollution control law prohibits any person from conducting an activity "which results in the discharge of any substance into the waters of the State without the appropriate permit, variance, or license." Such is not applicable to "unintentional nonpoint source discharge resulting from agricultural, horticultural, or aquacultural products." Regulations also exclude from the permitting requirements "introduction of pollutants from nonpoint sources resulting from normal agricultural and silvicultural activities."</p>	<p>State forestry law provides that any person who cuts standing cypress trees on water bottoms owned by the State of Louisiana is subject to a fine (up to \$5000) and/or imprisonment (up to six months). Furthermore, the State's Natural and Scenic Rivers Act prohibits commercial harvesting of timber within 100 feet of low water marks, with exceptions including selective harvesting of trees, cutting to control disease or insects, and harvesting timber for personal use by the person by person owning property. Civil penalties of up to \$1000 per day for each violation can be imposed.</p>
Maine	<p>Water pollution control law provides that "No person may directly or indirectly discharge or cause to be discharged any pollutant without first obtaining a license" from the appropriate State agency, a prohibition that includes nonpoint source discharges. If discharge, emission or deposit of any materials into any waters, air or land constitutes a substantial and immediate danger to the health, safety or general welfare, the governing State agency shall request the Attorney General to initiate immediate injunction proceedings to prevent such discharge. Additional enforcement mechanisms include administrative consent orders, civil injunctive remedies, and civil penalties of up to \$10,000 per day. Criminal violations can result in a fine of not less than \$100 nor more than \$25,000 per day of violation.</p>	<p>State forestry law authorizes rules to protect water quality. Management plans are required for clear cuts in excess of 50 acres. Landowners are required to notify the State's forestry agency prior to harvesting timber and to file reports on timber sales. Enforcement includes civil forfeitures of \$1,000 per violation of performance standards. Violation of notice requirements results in a civil forfeiture of \$50 for harvests of 50 cords or less and \$1000 for larger harvests or for failure to submit other reports. For unorganized portions of the State, the Land Use Regulation Commission establishes forest practice regulations, including timber harvesting standards for slash disposal, clearcut size/location, retention of buffer strips, and a general requirement to "reasonably avoid sedimentation of surface waters." The State's shoreland zoning law protects areas within 250 feet of the normal highwater line of any great pond, river or saltwater body, within 250 feet of a coastal wetland or the upland edge of a freshwater wetland, and within 75 feet of the highwater line of a stream. Statute limits timber harvesting in the protected areas to selective cutting of no more than 40 percent of trees 4 inches or more in diameter in any ten-year period, prohibits timber harvests within 75 foot areas abutting great pond shoreland zoned for resource protection, and requires reforestation within 2 growing seasons of any harvest beyond the 75-foot buffer.</p>
Maryland	<p>Water pollution control law provides that "a person may not discharge any pollutant into the waters of this State"; to accomplish such a requirement the Department of the Environment may require nonpoint source dischargers to obtain permits under certain circumstances. Enforcement of permits is by corrective action orders, injunctions, civil penalties not exceeding \$10,000 per day (judicially) or \$1,000 per day (administratively), or criminal prosecution. Furthermore, on land managed under an agricultural soil conservation and water quality plan approved by the local soil conservation district, "it is unlawful for any person to add, introduce, leak, spill, or otherwise emit soil or sediment into waters of the State or to place soil or sediment in a condition or location where it is likely to be washed into waters of the State by runoff of precipitation." Enforcement by injunctive relief or corrective action orders. Civil penalties are available up to \$25,000 per day or criminal penalties of up to \$50,000 and/or 1 year imprisonment.</p>	<p>State forestry law requires the Department of Natural Resources "to administer forest conservation practices on privately owned forest land and manage publicly owned forest lands," and authorizes the promulgation and enforcement of rules and regulations specifying forest practice standards which are to be enforced by district forestry boards. State law also provides for licensing of professional foresters. Under the State's Nontidal Wetlands program, forestry activities are required to have an erosion and sediment control plan, except that various forestry practices are exempted from the planning requirement. Under the Chesapeake Bay Critical Area Protection Program, "all harvesting of timber in the Chesapeake Bay Critical Area shall be in accordance with plans approved by the district forestry board."</p>

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Massachusetts	Water pollution control law prohibits any person from “. . . discharging any pollutant into waters of the commonwealth, except in conformity with a permit . . . or shall be punished by a fine . . . or by imprisonment . . . or shall be subject to a civil penalty not to exceed \$25,000 per day of such violation.” However, regulations issued pursuant to the law exempt from permit requirements “any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including runoff from orchards, cultivated crops, pastures, range lands, and forest lands.” Enforcement mechanisms, in addition to civil penalties, include orders and injunctive relief.	State forestry law (Forest Cutting Practices Act) requires preparation of minimum forest cutting practices and guidelines (best management practices). Landowners must give prior notice to the appropriate agency and to neighboring property owners of intent to harvest. The notice must include a proposed cutting plan. Not covered by the law is cutting for the owner’s own use, cutting less than 25,000 board feet or 50 cords, or land clearing activities. Enforcement is by stop work order and fine of up to \$100 per acre. Harvesting timber for hire or profit requires a license and requires licensees to demonstrate familiarity with the State’s laws on forestry and timber harvesting; enforcement is by fine and injunction. State law also prohibits the placement of slash within 25 feet of any continuously flowing stream, any pond, river, or water supply. Forestry operations in wetlands are subject to additional regulations and to best management practice requirements.
Michigan	Water pollution control laws prohibit persons from “. . . directly or indirectly discharging into the waters of the State any substance that is or may become injurious to . . . public health, safety or welfare . . . domestic, commercial, industrial, agricultural, recreational uses . . . value or utility of riparian lands . . . or livestock, wild animals, birds, fish, aquatic life, or plants. In response to said laws, the Department of Environmental Quality “may promulgate rules and issue orders restricting the polluting content of any waste material or polluting substance discharged or sought to be discharged into any . . . waters of the State.” State may bring civil actions or criminal prosecutions in court, revoke a permit, issue an order of abatement, or refer a case to the attorney general. Sanctions include civil fines of not less than \$2,500 nor more than \$25,000 per day, and criminal penalties and terms of imprisonment for knowing violations.	State forestry law authorizes forest improvement districts whereon minimum forest practice standards are to be applied. Members of a district must submit a forest management plan notifying the district board of intent to comply with the forest practice standards. The board can issue a notice of violation if a forest practice rule is violated and may order the member to make “reasonable efforts to repair the damage or correct the unsatisfactory condition.” If the member fails to comply, the board may take action and then file a lien to recover the costs of the action. State’s Inland Lakes and Streams law requires permits for projects that affect lakes and streams (for example, stream crossings). Enforcement is by civil action with fines up to \$10,000 per day.
Minnesota	Water pollution control law generally obligates every person to “notify” the State of the discharge of any substance or material that may cause pollution of the waters and the discharger to take all reasonable actions to minimize or abate the pollution caused. Pursuant to said law, rules state “No sewage, industrial waste or other wastes shall be discharged from either a point or nonpoint source into the waters of the State in such quantity or in such a manner . . . as to cause water pollution” Enforcement accomplished by criminal prosecution, civil penalties, injunction, and other actions to compel performance.	State forestry laws have few provisions regulating private forestry operations with respect to nonpoint source water pollution, although the Sustainable Forest Resources Act of 1995 provides for voluntary forest practice guidelines. Department of Natural Resources is prohibited from selling State forest land that “borders on or are adjacent to meandered lakes or public waters and water courses,” and if the Department harvests these State lands, it must “reserve the timber and impose other conditions deem(ed) necessary to protect watersheds, wildlife habitat, shorelines and scenic features.” Clear cutting is prohibited where “soil, slope or other watershed conditions are fragile” and where it occurs within certain distances within a “wild, scenic and recreation river.”
Mississippi	Water pollution control law prohibits any person “. . . to cause pollution of any waters of the State or to place or cause to be placed any wastes in a location where they are likely to cause pollution; and to discharge any wastes into any waters of the State which reduces the quality of such waters below established water quality standards.” Violations are enforceable by administrative orders, civil penalties of up to \$25,000 per day, injunction, or misdemeanor prosecution. Regulations provide that no permit may be required for nonpoint agriculture and silviculture pollution.	Forest Harvesting Law requires that certain numbers of trees be left on each acre for growing stock and/or seed trees after harvest. Law does not apply to land clearing for crop production or pasture, building sites or roads, nor to noncommercial cutting by owners for their own use. Enforceable by injunction or by misdemeanor prosecution with a fine of \$25-\$50 per working unit of 40 acres or less.
Missouri	Water pollution law provides it to be “. . . unlawful for any person to cause pollution of any waters of the State . . . or to discharge any water contaminants into any waters of the State which reduce the quality of such waters below established water quality standards.” Enforcement is through administrative penalties up to \$10,000 per day, civil penalties up to \$10,000 per day, and criminal prosecution.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Montana	<p>Water pollution control law makes it unlawful to "cause pollution . . . of any State waters or to place or cause to be placed any wastes where they will cause pollution of any State waters." However, exempt from the prohibition is "any placement of materials that is authorized by a permit issued by any State or Federal agency . . . if the agency's permitting authority includes provisions for review of the placement of materials to ensure that it will not cause pollution of State waters." Statute also makes it unlawful to "cause degradation of State waters without authorization" and establishes a detailed nondegradation policy for State waters. Department of Environmental Quality has general inspection and penalty authority for violations of the water quality code, including issuance of specific compliance orders, cleanup orders, and administrative penalties of up to \$10,000 per violation per day. Civil actions include temporary and permanent injunctions, while judicial remedies include civil penalties of up to \$25,000 per day and, for willful or negligent violations of the discharge prohibition, criminal fines of up to \$25,000 per day, imprisonment of up to one year, or both. Criminal penalties may be doubled for repeat violations</p>	<p>State forestry law requires creation of "streamside management zones" for forest streams (strip at least 50 feet wide) within which certain activities are prohibited, including: broadcast burning; off-road vehicle operation; clearcutting; road construction (unless necessary for stream crossing); handling, storage, application or disposal of hazardous substances; and deposit of slash in water bodies. Department of Natural Resources and Conservation has inspection authority on Federal, State and private land to ensure compliance with the rules for streamside management zones and may issue civil penalties of up to \$1,000 per day, as well as rehabilitation orders. State's forest practice law requires use of best management practices and requires that notice be given prior to commencement of any forestry practices. Consultation with landowner or operator may result, the intent of which is to provide information and advice.</p>
Nebraska	<p>Water pollution law makes it unlawful to "cause pollution of any . . . waters . . . of the State or to place or cause to be placed any wastes in a location where they are likely to cause pollution" of State waters. Enforcement is through corrective action orders, injunctions, civil penalties up to \$10,000 per day, and criminal (felony and misdemeanor) prosecution. State may recover damages for restocking the waters with fish or replenishing wildlife.</p>	<p>State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities. However, the State's Erosion and Sediment Control Act may be applicable to forestry activities to control soil loss.</p>
Nevada	<p>Water pollution control law authorizes prescriptions for "diffuse sources" (equivalent to nonpoint sources) of water pollutants that are "significantly causing or adding to water pollution in violation of a water quality standard." Special regulations exist to protect the Lake Tahoe watershed, namely it is illegal to discharge waste within 100 feet of the lake or a stream or other water supply in the watershed.</p>	<p>State forestry law requires a permit for logging operations and conversion of timber land "to any use other than the growing of timber." All logging permits require the use of best management practices to prevent, eliminate or reduce water pollution from diffuse sources. Violation of permit conditions can result in administrative revocation of permit and/or charge of a misdemeanor violation punishable with a fine (up to \$1000) and/or imprisonment (six months or less). Statute prohibits "felling of trees, skidding, rigging or construction of roads within 200 feet of a waterbody" or tractor logging on slopes of 30 percent. Variances may be granted for both prohibitions. Tractor skid trails, landings, logging truck roads and firebreaks to be located, constructed, used and left so as to not "appreciably diminish water quality."</p>
New Hampshire	<p>Water pollution control law does not expressly focus on nonpoint sources yet requires that ". . . after adoption of a given classification for a stream, lake, pond, tidal water, or section of such water, it shall be unlawful for any person or persons to dispose of any sewage, industrial, or other wastes, in such a manner as will lower the quality of these waters . . ." The Department may issue cease and desist orders, seek injunctive relief in courts, request civil penalties of up to \$10,000 per day, or impose administrative penalties of not more than \$2,000 per offense. Willful or negligent violations, or knowing failure to obey a lawful order subjects the violator to a fine of up to \$25,000 per day and/or imprisonment for up to 6 months.</p>	<p>State forestry law authorizes the Department of Resources and Economic Development, to develop and implement enforceable provisions regarding timber harvesting on private and public lands. Law requires filing of a notice of intent to cut, cross-compliance with the State's wetlands permitting program, and compliance with the State's Alteration of Terrain Program. Prohibited is harvesting within specified distances of great ponds, standing bodies of water and within 50 feet of any perennial stream. Law also prohibits disposal of slash and mill residue in any perennial stream or standing body of water. Cease and desist orders can be issued against any timber operation in violation of the law; violations may be enjoined by superior court. Administrative fines may be also assessed for any offense, not to exceed \$2,000 per violation. The Alteration of Terrain program requires loggers to notify of intent to cut and obligates them ". . . to abide by appropriate best management practices to include all State laws pertaining to logging operations." State's Comprehensive Shoreland Protection law is also partly applicable to forestry activities as it requires natural woodland buffers near shorelands.</p>

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
New Jersey	Water pollution control law prohibits the discharge of any pollutant except as authorized by statute or under a permit. Enforcement provisions include compliance orders, injunctive relief, and civil penalties of not more than \$50,000 for each violation, and criminal sanctions if there is a knowing or reckless violation which causes a significant adverse environmental effect.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
New Mexico	Water pollution control law does not contain enforceable provisions directly applicable to nonpoint source discharges. However, law does authorize the Water Quality Control Commission broadly to "promulgate and publish regulations to prevent or abate water pollution in the State" and to require permits. Law provides for administrative orders with penalties up to \$25,000 per day.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities. However, the State's forest practices law requires permits and inspections for timber harvesting beyond specified minimum timber volumes and harvest areas. New Mexico counties may also enact enforceable ordinances addressing harvest practices (Rio Arriba County has a timber harvest permit process that incorporates as mandatory conditions the State's voluntary forest practice guidelines).
New York	Water pollution law declares State policy to maintain reasonable standards of water purity "and to that end require the use of all known available and reasonable methods to prevent and control the pollution of the waters of the State." Enforcement is by administrative order, injunction, a civil penalty of up to \$25,000 per day, or for willful violations by criminal prosecution.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
North Carolina	Water pollution law specifies (absent a permit or special order) no person shall "cause or permit any waste, directly or indirectly, to be discharged to or in any manner intermixed with the waters of the State in violation of the water quality standards applicable to the assigned classifications." Violators of the law may be assessed civil penalties of up to \$10,000 per violation per day, misdemeanor criminal fines of up to \$15,000 per violation per day, or felony criminal fines of up to \$250,000 per violation per day; they also are subject to injunctive relief.	Sedimentation Pollution Control Act (regulates certain kinds of land-disturbing activity) that causes erosion and sedimentation requires the Department of Environment, Health and Natural Resources to adopt "Forest Practice Guidelines Related to Water Quality" (best management practices for forest activity). The Guidelines are presented in the North Carolina Administrative Code as well as in a Forestry Practices Manual issued by the Division of Forest Resources. Forest activities conducted in accordance with these Guidelines are exempt from the other provisions of the Act.

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
North Dakota	<p>Water pollution law makes it unlawful "to cause pollution of any waters of the State or to place or cause to be placed any wastes in a location where they are likely to cause pollution of the waters of the State." This provision is not restricted to point sources. State law also requires a permit for a range of activities that would cause a "discharge" or "would otherwise alter the physical, chemical, or biological properties of any waters of the State in any manner not already lawfully authorized." Enforcement actions include emergency orders, judicial injunctions, fines of up to \$50,000, and, for willful violations, jail terms of 1 or 2 years. Civil penalties of up to \$10,000 per day are also available for violations without willful intent.</p>	<p>State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.</p>
Ohio	<p>Water pollution law declares "No person shall cause pollution or place or cause to be placed any [pollutants] that cause pollution of any waters of the State" However, exempted are ". . . pollution . . . resulting from farming, silvicultural, or earthmoving activities." Local units of government (such as Soil and Water Conservation Districts) have inherent powers to abate such nuisances if so determined.</p>	<p>Law specifically provides for control of sediment and related runoff from agricultural and silvicultural activities by directing the Division of Soil and Water Conservation, Department of Natural Resources (with the approval of the Soil and Water Conservation Commission) to adopt rules establishing "technically feasible and economically reasonable standards to achieve a level of management and conservation practices in farming or silvicultural operations that will abate wind or water erosion of the soil or abate the degradation of the waters of the State by animal waste or by soil sediment including substances attached thereto." The law further empowers the Division to "establish procedures for . . . enforcement of rules for agricultural and silviculture pollution abatement." The law is implemented at the farm and forest level by local soil and water conservation districts.</p>
Oklahoma	<p>Water pollution law makes it "unlawful for any person to cause pollution of any waters of the State or to place or cause to be placed any wastes in a location where they are likely to cause pollution of any air, land or waters" and declares any such action to be a public nuisance. Regulations expressly construe the law to include nonpoint sources. For violations, the Department of Environmental Quality may seek an injunction, a civil penalty of up to \$10,000 per violation, and/or misdemeanor criminal penalties of \$200 to \$10,000, imprisonment for up to six months, or both. However, the law divests the Department's of jurisdiction over agricultural and silvicultural nonpoint sources, instead assigning jurisdiction to the Department of Agriculture for agricultural discharges and to the Conservation Commission for erosion control. Neither of these entities appears to have enforcement authorities applicable to nonpoint source discharges.</p>	<p>State Board of Agriculture "shall administer silviculture best management practices in cooperation with forestry land users under the provisions of State and Federal water pollution laws, which include the process to identify silviculturally-related nonpoint sources of pollution as defined by the Oklahoma Environmental Quality Code and setting forth procedures and methods to control to the extent feasible such sources." The statute does not expressly set out enforcement authority for best management practices.</p>
Oregon	<p>Water pollution control law prohibits persons from polluting "any waters of the State," from placing waste where it is "likely to escape or be carried into the waters of the State by any means," and from discharging wastes into water if the discharge reduces water quality "below the standards established by rule for such waters." The general prohibition is not expressly limited to point sources; it is interpreted to address nonpoint source discharges. Violations of the general prohibition provision are deemed a public nuisance.</p>	<p>State's Forest Practices Act requires that forest operations be conducted in accordance with rules and standards "relating to air and water pollution control." State Forestry Board establishes best management practices (BMPs) "to insure that nonpoint source discharge of pollutants resulting from forest operations do not impair the achievement and maintenance of water quality standards." Operators are required to comply with BMPs, unless they can demonstrate that alternative practices yield better results. Forestry Board is authorized to require a written plan for forestry operations if operations are within one hundred feet of a stream used by fish or for domestic use. Also, operators must give written notice of chemical applications to Forestry Board which in turn must notify persons that are within 10 miles of the application and hold downstream surface water rights. Where forest operators are in compliance with the Board's BMPs, then the operations are not considered in violation of any water quality standards. Also, forestry operations are immune from private nuisance actions if they are in compliance with the Act and with BMPs. Enforcement is through inspection, notice of violation, issuance of administrative orders (cease and desist or reparation orders) and general criminal and civil penalties, including potential civil sanctions of up to \$5000 per violation.</p>

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Pennsylvania	Water pollution law authorizes the State to "enforce reasonable orders and regulations for the protection of any source of water for present or future supply to the public, and prohibiting the pollution of any such source of water rendering the same inimical or injurious to the public health or objectionable for public water supply purposes." Violation of law is a summary offense punishable by a fine of not less than \$100 nor more than \$10,000 for each offense. Willful or negligent violations are misdemeanors punishable by a fine of not less than \$2,500 nor more than \$25,000 for each separate offense and/or imprisonment in the county jail for a period of not more than one year. Civil penalties may be assessed not to exceed \$10,000 per day per violation. State may also issue orders or seek injunctive relief.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities. However, with respect to erosion and sediment related pollutants, forest harvesting activities involving earthmoving must comply with the regulatory program authorized by the Clean Streams Law.
Rhode Island	Water pollution law makes it ". . . unlawful for any person to place any pollutant in a location where it is likely to enter the waters . . ." of the State. Enforcement is by notices of violation, compliance orders, injunctive relief, criminal liability, and civil penalties of up to \$25,000 per day.	State forestry law requires, for the cutting of trees for commercial forest products, registration with the Department of Environmental Management as a "woods operator." Cutting without such registration is a misdemeanor punishable by a fine of \$100 to \$500.
South Carolina	Water pollution law makes it ". . . unlawful for any person, directly or indirectly, to . . . discharge pollutants into the waters of the State, except as in compliance with a permit issued by the Department of Health and Environmental Control"(DHEC). Enforcement is by administrative orders, injunctive relief, civil penalties of up to \$10,000 per day, and criminal penalties for willful or negligent violation of \$500 to \$25,000 per day and/or imprisonment for up to 2 years.	State forestry law does not specifically address (regulate) nonpoint sources of water pollutants on private lands, although state-owned forest land is addressed. The Erosion and Sediment Reduction Act requires the DHEC to promulgate regulations for erosion and sediment reduction and stormwater management on land owned by the State, a State agency, a quasi-state agency or land under the management or control of such an entity. For forest land controlled by the State Forestry Commission, the Commission must develop and implement a sediment reduction plan, doing so in consultation with the DHEC.
South Dakota	Water pollution law prohibits discharges of waste that result in water quality violations, and the placement of wastes in locations where they are likely to cause water pollution. The State's Water Management Board is required to promulgate water quality standards and to classify water according to its beneficial uses. The standards must protect public health, use of waters for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes and agricultural, industrial, and other legitimate uses. Persons violating rules are liable for a civil penalty not to exceed \$10,000 or for damages to the environment, or both. Criminal violations are misdemeanors subject to a fine not to exceed \$10,000 and/or a sentence of up to one year imprisonment.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Tennessee	Water pollution law (Water Quality Control Act of 1977) prohibits "the discharge of sewage, industrial wastes or other wastes into waters, or a location from which it is likely that the discharged substance will move into waters . . ." However, the law does not apply to "any agricultural or forestry activity or the activities necessary to the conduct and operations thereof or to any lands devoted to the production of any agricultural or forestry products, unless there is a point source discharge from a discernible, confined, and discrete water conveyance." Enforcement of the law is through corrective action orders, civil penalties up to \$10,000 per day, criminal misdemeanor prosecution, and injunctions. Violators are also subject to a cause of action for damages.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
Texas	Water pollution law provides that ". . . no person may discharge sewage, municipal waste, recreational waste, agricultural waste, or industrial waste into or adjacent to any water in the State." Exempted from this prohibition are discharges authorized by permit, discharges in compliance with a certified water quality management plan as provided under the State agriculture code, and activities under the jurisdiction of the Department of Parks and Wildlife, General Land Office (coastal management) or the Railroad Commission of Texas. Enforcement is through administrative penalties up to \$10,000 per day, civil penalties of between \$50 and \$10,000, and injunctions.	State Soil and Water Conservation Board and soil and water conservation districts are empowered to plan, implement and manage programs for abating agricultural and silvicultural nonpoint source pollution. Where silvicultural nonpoint sources are identified as important water quality problems, the Board can certify a program for addressing the problem, using local soil and water conservation districts as the key implementers of the plan. The Board adopts rules for the plans in compliance with State water quality standards.
Utah	Water pollution law makes it unlawful for any person to discharge a pollutant into waters of the State or to cause pollution which constitutes a menace to public health and welfare, is harmful to wildlife, fish or aquatic life, or impairs domestic, agricultural, industrial, recreational or other beneficial uses of water. Violations of these prohibitions are treated as a public nuisance. If violations occur, the State's Water Quality Board may give written notice, may seek injunctive relief in a civil action, pursue civil penalties not to exceed \$10,000, or, in the case of willful or gross negligence, seek fines not to exceed \$25,000.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.
Vermont	Water pollution control law prohibits "discharge [of] any waste, substance or material into the waters of the State" without a permit. For certain classes of waters, the State "shall not regulate accepted agricultural or silvicultural practices, as are defined by the commissioners of agriculture, food and markets and forests, parks and recreation . . ." Law is enforceable by administrative orders, emergency orders, administrative penalties of up to \$25,000 for a single violation \$10,000 per day (but not more than \$100,000 total) for a continuing violation, civil enforcement, and criminal enforcement.	State forestry law requires notice of intent to harvest when harvest involves more than forty acres. State forestry agency must review the proposed harvest to determine compliance with silvicultural guidelines and forestry standards and requirements with respect to water quality, wetlands, and riparian zones. Exemptions from notice are properties under a State approved forest management plan. Violation of law or rules may result in a penalty of up to \$50,000 and up to \$25,000 per day for a continuing violation. Municipal bylaws may not restrict "accepted silvicultural practices."
Virginia	Water pollution law provides that ". . . except as otherwise permitted by law, it shall be unlawful for any person to [place pollutants] into State waters which can substantially impair the lawful use or enjoyment of such waters and their environs by others." Violations are misdemeanors and punishable by "a fine of not less than \$100 nor more than \$500 or by confinement in jail not more than twelve months or both such fine and imprisonment." Any person whose property is damaged or whose property is threatened with damage may seek from the court ". . . an injunction enjoining any violation of this law . . ."	State forestry law declares that if silvicultural activities are being conducted in a manner that causes or is likely to cause pollution, the State forester ". . . may advise the owner or operator of corrective measures needed to prevent or cease the pollution." The State forester is also granted authority ". . . to issue special orders to any owner or operator . . . to cease immediately all or part of silvicultural activities on a site and to implement specified corrective measures within a stated period of time." Also authorized is the issuance of emergency orders (without advance notice or hearing) if an ". . . owner or operator is conducting any silvicultural activity in a manner which is causing or is likely to cause an alteration of the physical, chemical or biological properties of any State waters resulting from sediment deposition . . ." A civil penalty of up to \$5,000 per violation per day may be assessed after the owner or operator has been given an opportunity for a hearing. Orders may be enforced by injunction.
Washington	Water pollution law prohibits the discharge of "any organic or inorganic matter that shall cause or tend to cause" water pollution and requires a permit for the disposal of solid or liquid waste material into waters of the State. The State Department of Ecology ("DOE") enforces the law by bringing an action, issuing orders or directives, or imposing penalties. Willful violations are crimes punishable by a fine of up to \$10,000 and/or imprisonment for not more than one year. Civil violations incur penalties of up to \$10,000 per day per violation.	State forestry law (forest practices act) requires the State forest practices board to promulgate regulations that establish minimum forest practices standards. Regulations determine which forest practices fall within which of four classes of practices, ranging from Class I, requiring no notification, through Classes II-IV requiring notification and submission of an application for approval. Class IV forest practices are considered to have "a potential for substantial impact on the environment and therefore require an evaluation." The State departments of Ecology and Natural Resources enforce the law. The attorney general also may engage in enforcement actions, and a county may bring actions in superior court against the State departments, landowners, timber owners, and operators. Sanctions include civil penalties, collect costs, or disapproval, for up to one year, of a forest practices application.

Table 8 (continued)

State	Nonpoint Source Water Pollution Control Law	Forestry Nonpoint Source Water Pollution Law
West Virginia	Water pollution law generally does not appear to provide for the regulation or prohibition of nonpoint source discharges.	State forestry law also requires a license for commercial timber harvest and purchase of timber or logs for resale, and certification of supervisors of logging sources. If the Division of Forestry notifies the Office of Water Resources (Division of Environmental Protection) that failure to use a particular best management practice is causing or contributing, or has the potential to contribute, to soil erosion or water pollution, the Division of Environmental Protection may issue a written compliance order, issue immediate suspension of work orders, suspend licenses or certificates for 30 to 90 days for the second violation within two years, or revoke licenses or certificates for third violations within two years. The Division may seek civil penalties of up to \$2,500 for the first offense and \$5,000 for subsequent offenses.
Wisconsin	Water pollution law authorizes the Department of Natural Resources (DNR) to issue general orders and adopt rules applicable for "preventing and abating pollution of the waters of the State." The DNR may issue orders for the abatement of nonpoint source pollution which the Department has determined to be significant on a case-by-case basis. Violators of agency orders are subject to administrative penalties of up to \$5,000 per day.	State forestry law provides for a tax incentive program that requires submission of a forest management plan. Failure to file notice of intent to harvest can result in fines up to \$1,000. Persons intentionally harvesting merchantable timber in violation of the law are subject to forfeiture equal to 20 percent of the current value of the timber harvested. Furthermore, "All slash which falls into or is deposited in any lake or stream or on the land of an adjoining owner, shall be immediately removed . . ." Violators are subject to fines of not more than \$50, however repeat offenders are subject to higher fines and imprisonment.
Wyoming	Water pollution law (Wyoming Environmental Quality Act) prohibits "causing, threatening or allowing the discharge of any pollution or waste into the waters of the State" or "altering the physical, chemical, radiological, biological or bacteriological properties of any waters of the State" unless authorized by permit. Enforcement measures include cease-and-desist orders, temporary and permanent injunctive relief, reparations for damages, civil penalties of up to \$10,000 per violation per day, and criminal penalties of up to \$25,000 per violation per day and/or imprisonment of up to one year.	State law does not appear to contain enforcement requirements specifically focused on nonpoint source water pollution from forestry activities.

Sources: Adapted from Ellefson and others 1995, Environmental Law Institute 1997 and 1998, National Conference of State Legislatures 2001, and Forest Service 2001b.

The diversity of State agency capacity and involvement in the enforcement of forest resource standards is extensive (Ellefson and others 2001b and 2002). Recent analyses for 2000 indicate that more than 100 State cabinet-level executive branch units are so engaged, while more than 200 entities at the subcabinet first tier level have direct or indirect responsibility for enforcement activities (Table 9). Governing and advisory bodies to executive branch units also had enforcement responsibilities, namely more than 50 such units existed in various States. As for influence over forest sustainability, over half the State entities (first-tier sub cabinet entities) so involved had moderate or substantial influence over the use, management, and protection of forests. Governing or advisory bodies had somewhat less enforcement influence, namely only 4 of 10 had a moderate or substantial influence.

Table 9. State Government Executive Branch Units Exercising Enforcement Functions Involving the Use, Management, and Protection of Forests by Organizational Level and Type of Activity, 2000

Primary Enforcement Function	Cabinet or Subcabinet Level Executive Branch Units			Governing or Advisory Bodies to Executive Branch Units
	Cabinet Level	Subcabinet Level First Tier	Subcabinet Level Second Tier	
Functional Enforcement Activities				
Administration, Personnel, Operations	4	10	2	0
Information, Information Management	5	29	12	3
Law, Legal Counsel	51	27	3	0
Occupational Licensing	2	6	1	9
Planning, Budgeting, Review, Analysis	8	18	9	3
Regulation, Permits, Enforcement	1	22	11	3
Other	13	17	3	3
Total	84	129	41	21
Resource Oriented Enforcement Activities				
Air Quality, Pollutant Management	1	29	9	8
Energy Conservation	14	9	5	1
Environmental Quality, Protection, Management	22	16	0	21
Waste Management, Recycling	0	19	7	4
Chemical and Pesticide Abatement	0	4	4	2
Water Quality, Pollutant Management	0	33	15	6
Other	1	12	4	2
Total	38	122	44	44
TOTAL	122	251	85	65

Note: Some units recorded more than once because of multiple enforcement functions.
Source: Ellefson and others 2001b and 2002.

The enforcement of forest practice standards in some States is confined by State law that limits or conditions ability to adopt enforceable regulations that are more stringent than any Federal environmental regulations. Known as “no more stringent” laws, such statutes occur in about one-third of the States and typically are focused, but not exclusively so, on nonpoint sources (including forest sources) of water pollutants. For example, Montana State law prohibits rules “more stringent than

the comparable Federal regulations or guidelines that address the same circumstances”; Kentucky forbids imposition under any permit “any limitation, monitoring requirement, or other condition which is more stringent than . . . would be applicable under federal regulation”; Oregon bars the Environmental Quality Commission and the Department of Environmental Quality from “. . . promulgating or enforcing any effluent limitation upon nonpoint source discharges from forest operations on forest lands unless mandated under the Clean Water Act”; and Idaho requires environmental agencies in the water pollution control area to “. . . not impose requirements beyond those of the federal clean water act.” Other States with similar statutory provisions are Florida, Maine, Maryland, Mississippi, Ohio, Pennsylvania, South Dakota, Utah, and Wisconsin. Not all prohibit outright adoption of enforcement standards more stringent than Federal law; many require a detailed and complex set of justifications and procedural reviews if proposed State standards are more stringent than Federal requirements. Among problems with “no more stringent laws” is the loss of State flexibility to address unique and especially severe resource problems that may require more severe enforceable measures than authorized by Federal law (Environmental Law Institute 1997).

Enforcement Mechanisms

State agencies that are responsible for administering forest practice regulatory programs focused on private forests have substantial institutional capacity to enforce laws and rules. They do so in a variety of ways, including the use of informal conferences, notices to comply, stop work orders, corrective actions, civil penalties, injunctions, and civil and criminal penalties. Information describing the nature of these enforcement actions is readily available from State agencies that are responsible for such programs (Ellefson and others 1995). For example, from 1984 through 1991, regulatory enforcement actions in California added up to misdemeanor actions — 461, injunctions — none, license denials —4, and corrective actions — 110. In Oregon during 1989, 109 citations were issued as follows: failure to notify of intent to harvest — 32 percent of citations, improper harvest activities — 24 percent, improper written plans — 16 percent, road construction and maintenance — 15 percent, incomplete reforestation — 9 percent, and inappropriate chemical application — 2 percent. Similar information exists for other States with regulatory programs focused on forests.

State forest practice laws often authorize State agencies to, as an enforcement mechanism, repair damage caused by violations of forest practice rules. For example, the Washington Department of Natural Resources “may expend funds available to undertake and complete [corrective forest practices], and operator, timber owner, forest land owner shall be jointly liable for the actual, direct cost thereof.” Similarly in Oregon, “the State Forester or by contract [shall] repair the damage or correct the unsatisfactory condition . . . and shall prepare an itemized [cost] statement thereof and shall deliver a copy to the operator, timber owner and landowner.” Under Maryland’s

Critical Area's Act. Illegal timber cutting resulting in failure to reforest can result in circuit court assessing violators the cost of replanting the trees. And in Vermont, the Secretary of the Agency of Natural Resources may "fix and order compensation for any public property destroyed, damaged or injured [as a result of unacceptable discharge in waters]" and may order persons responsible for water pollutants to reimburse governments that have taken corrective action. Other States that have authority to take corrective action include Idaho and Nevada. Operators and landowners that fail to take corrective action and subsequently do not reimburse the State for the cost of doing so may be refused future permits to harvest timber or may have liens imposed on their forest property. In Idaho, for example, the State will not accept an operator's notification of intent to harvest timber until corrective action is taken on a previously harvested site. In California and Oregon, the State has authority to place a lien on property. Oregon's authority in this respect is clear, failure to reimburse the State for corrective actions ". . . shall constitute a general lien upon the real and personal property of the operator, timber owner, and landowner . . . and may be foreclosed in the manner provided by law."

Laws known as "bad actor laws" or "contingency regulations" have been adopted by at least 12 States in recent years. The laws impose obligations on only those landowners or timber harvesters who have already committed — or are in the process of committing — violations of standards considered necessary to forest sustainability. Under these types of statutes, the owner or harvester has no prior obligation (for example, to obtain a permit before harvesting) and the enforcement response tools are more limited, more narrowly focused, and less complex than might occur under comprehensive regulatory laws. States with such laws include *Delaware* (. . . if a person is conducting silvicultural activities in a manner that is likely to pollute waterway, the State forester can issue special orders requiring cessation of the activities and implementation of corrective measures); *Virginia* (. . . if silvicultural activities are being conducted in manners that causes pollution, a cease and desist order may be issued and corrective actions may be ordered, orders enforceable by injunction); *Idaho* (. . . if a landowner or timber harvester fails to apply appropriate best management practices or is known to have willfully caused degradation of water resources, an operating bond may be required as a condition for continuing timber harvesting activities); *West Virginia* (. . . if failure to use a particular best management practice is causing or contributing to soil erosion and water pollution, an order for immediate suspension of work may be issued if there is a present danger to life or if the result may be uncorrectable soil erosion); and *New Hampshire* (. . . State is authorized to issue cease and desist orders to suspend logging or forestry operations in areas where actions are likely to result in pollution of surface water or ground water).

Information about civil and criminal penalties for violation of legally established forest practice standards is readily available from various compilations of State forestry and related law. For example, penalties of the following nature existed in

1992: Alaska – civil penalty up to \$10,000 per violation; California – criminal penalty up to \$1,000 and/or six months in prison; Connecticut – civil penalty up to \$5,000 for each offense; Idaho – criminal penalty misdemeanor violation with fines recoverable by administering agency; Maine – civil penalty for failure to notify (harvest of less than 50 cords -- up to \$50, more than 50 cords -- up to \$1,000 each occurrence), continued operation after cessation order up to \$1,000 per day; Massachusetts – civil penalty up to \$100 per acre for each acre in violation, harvest without license \$500 per violation; Montana – civil penalty up to \$1,000 per violation (Streamside Management Act); Nevada – criminal penalty misdemeanor fines and prison sentence; New Mexico – criminal penalty misdemeanor fines and prison sentence; Oregon – civil penalty up to \$10,000 per violation and criminal penalty misdemeanor of \$2,500 or 1 year in prison for individual and \$5,000 or twice the gain for corporations; Virginia – civil penalty up to \$5,000 per violation; Vermont – civil penalty up to \$10,000 per day of violation and criminal penalty up to \$25,000 and/or up to 6 months in prison; Washington – civil penalty up to \$5,000 per violation and criminal penalty \$100 to \$1,000 and/or 1 year in prison; and West Virginia – civil penalty up to \$2,500 first offense and up to \$5,000 subsequent offenses (Ellefson and others 1995). Some States rely on a matrix of factors when imposing penalties, one factor being prior violations of a landowner or timber harvester (for example, Montana's implementation of streamside management zone regulations).

Investments and Personnel

States have a number of professionals engaged in enforcement activities important to sustainable forestry. Unfortunately, nearly all the readily accessible information concerns enforcement personnel involved with forest practice laws administered by State agencies. Information about enforcement and investigation personnel involved in arson, theft, and fraud may exist but have not been compiled and analyzed. Similarly, little is known about the enforcement personnel of agencies with broader environmental responsibilities that are relevant to forest resource conditions (for example, pollution control agencies, departments of agriculture, environmental quality boards). As for personnel involved in forest practice regulatory law enforcement (Table 10), the 10 States with comprehensive forest practice regulatory programs in 1992 employed more than 320 full-time equivalents to carry out their programs (Table 10). Such represented only 5 percent of the total full-time employees of lead forestry agencies in the 10 States considered. If enforcement personnel affiliated with agencies that are not traditionally considered lead forestry agencies is included, the number exceeds 400 (Table 11).

Table 10. Lead State Forestry Agency Staffing for the Administration of Comprehensive Forest Practice Regulatory Programs by Selected States, 1985–1991

State	Staffing (full-time equivalents)						
	1985	1986	1987	1988	1989	1990	1991
Alaska	6.5	6.5	4.5	2.5	2.5	3.0	3.0
California	68.0	68.0	68.0	68.0	74.0	83.0	94.0
Connecticut	-	-	-	-	-	-	4.0 est
Idaho	4.5	5.5	5.5	8.0	10.0	8.0	13.7
Maine	-	-	-	-	-	6.0	6.0
Massachusetts	16.0	16.0	17.0	16.0	15.0	15.0	15.0
Nevada	5.0	5.0	5.0	5.0	5.0	5.0	5.0
New Mexico	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Oregon	44.1	48.2	48.2	53.6	62.6	64.3	64.3
Washington	58.1	58.1	73.0	73.0	77.5	77.5	112.8
TOTAL	209.2	214.3	228.2	233.1	253.6	273.1	324.8

Source: Ellefson and others 1995.

Table 11. Staffing of State Forest Practice Regulatory Programs by Selected States and Administering Agency, 1991

State and Agency	Staffing (full-time equivalents)
Alaska	
Division of Forestry	3.0
Division of Fish and Game	5.0
Department of Environmental Conservation	2.0
California	
Department of Forestry and Fire Protection	94.0
Regional Water Quality Agencies	12.0
Department of Fish and Game	10.0
State Water Resources Board	1.0
Connecticut	
Division of Forestry	4.0 (est)
Florida	
Regional Water Management Districts	2.8
Idaho	
Department of Lands	13.7
Division of Environmental Quality	4.0
Maine	
Maine Forest Service	6.0
Department of Inland Fisheries and Wildlife	0.5
Land use Regulation Commission	1.0
Department of Environmental Protection	0.1
Maryland	
Chesapeake Bay Critical Areas Program	8.0
Waterways Access Program	4.0 (est)
Nontidal Wetlands Program	1.0
Massachusetts	
Division of Forests and Parks	15.0
Montana	
Division of Forestry	2.0
Nevada	
Division of Forestry	5.0
New Mexico	
Division of Forestry and Resources Conservation	7.0
Oregon	
Department of Forestry	64.3
Department of Environmental Quality	2.0
Department of Fish and Wildlife	2.0
Washington	
Division of Forest Practices	112.8
Department of Fisheries	7.0
Department of Ecology	9.2
Department of Wildlife	5.0
TOTAL	403.4

Source: Ellefson and others 1995.

Information about the intensity of enforcement efforts (investments per acre, personnel per acre, and field inspections) is especially relevant to an understanding of institutional enforcement capacity. Except for the 10 States with lead forestry agencies that are responsible for comprehensive forest practice regulatory programs, such information has not been gathered and analyzed. Institutional capacity measurements for 1992 for these States is as follows (Ellefson and others 1995): *Alaska*: 0.05 FTEs per 100,000 acres private forests, \$7 investment per 1,000 acres,

40 percent of FTE time on field inspections; *California*: 1.26 FTEs per 100,000 acres private forests, \$543 investment per 1,000 acres, 40 percent of FTE time on field inspections; *Idaho*: 0.42 FTEs per 100,000 acres private forests, \$164 investment per 1,000 acres, 60 percent of FTE time on field inspections; *Maine*: 0.04 FTEs per 100,000 acres private forests, \$20 investment per 1,000 acres, 10 percent of FTE time on field inspections; *Massachusetts*: 0.59 FTEs per 100,000 acres private forests, \$20 investment per 1,000 acres, 35 percent of FTE time on field inspections; *Nevada*: 4.46 FTEs per 100,000 acres private forests, \$16,234 investment per 1,000 acres, 45 percent of FTE time on field inspections; *New Mexico*: 0.36 FTEs per 100,000 acres private forests, \$27 investment per 1,000 acres, NA percent of FTE time on field inspections; *Oregon*: 0.75 FTEs per 100,000 acres private forests, \$318 investment per 1,000 acres, 45 percent of FTE time on field inspections; and *Washington*: 1.26 FTEs per 100,000 acres, \$ 836 investment per 1,000 acres, 15 percent of FTE time on field inspections.

State capacity to enforce the use of forest practice codes often depends on informed landowners and professionally astute timber harvesters and professional resource managers (foresters, wildlife managers). In 1995, 25 States had active registration, certification, or licensing programs for timber harvesters (MacKay and others 1996). Of this total, six States had licensing programs wherein a person was not allowed to conduct timber harvesting activities without demonstrating (by written or field exams) an informed ability to do so. In nearly all cases, an understanding of a State's code of best forest practices was the basis for granting a license. In 2001, 26 States reported certification programs for timber harvesters while 13 States reported some form of licensing of professional foresters (National Association of State Foresters 2001).

Monitoring and Analysis

Enforcement activities of State forestry agencies rely on an ability to monitor the rate at which the forest practice standards are being applied. Only then can they redirect or intensify their enforcement capacity toward critical problems or opportunities. In 1997, 34 States conducted compliance monitoring programs to determine whether the codes were being applied (Tables 12) (Ellefson and others 2001a). Although nearly one-third of the States had not initiated a formal compliance monitoring program, this does not mean forest practices are not monitored in those States. In some, monitoring activities (inspections) are carried out when landowners benefit from cost-share practices (for example, Federal Forestry Incentives Program and Stewardship Incentives Program) or when formally designed Tree Farms are reinspected. In States where forestry operations are by law incomplete until approved by an inspector, the required preharvest and postharvest inspections are considered compliance monitoring. Legislative directives often compel compliance monitoring. Montana requires determination of "how current forest practices are affecting

watersheds,” Minnesota requires “a program for monitoring silviculture practices and the application of timber harvest and forest management guidelines,” and Washington requires “annual assessment of how regulations and voluntary processes are working.” (Ellefson and others 2001a).

Table 12. State Programs Monitoring Compliance with Best Forest Practice Standards by Region and Number of States, 1997

Region	State Compliance Monitoring Program		Compliance Monitoring Conducted			Training Required to Participate in Monitoring	Incentive Provided Private Landowner to Access Property	Individual Landowner Compliance Information Made Public
	Yes	No	All Harvested Sites	Sample of Harvested Sites	Certain Sites More Intensely			
North	11	9	2	9	4	10	2	5
South	13	0	2	12	2	11	0	7
West	10	7	4	5	7	7	1	9
Total	34	16	8	26	13	28	3	21

Note: Compliance monitoring may be focused on forest practice guideline programs that are voluntarily complied with, mandatorily required of landowners and harvesters, or both. Nationally, 13 States have compliance monitoring programs part of a voluntary practice program (North -- 4; South -- 8; West -- 1), nine part of a mandatory program (North -- 3; South -- 1; West -- 5), and 12 involve both voluntary and mandatory programs (North -- 4; South -- 4; West -- 4). North Region: CT, DL, IA, IL, IN, MA, MD, ME, MI, MN, MO, NH, NJ, NY, OH, PA, RI, VT, WV, WI; South Region: AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA; West Region: AK, AZ, CA, CO, HI, ID, KS, MT, NB, ND, NM, NV, OR, SD, UT, WA, WY.

Source: Ellefson and others 2001a.

Table 13. State Programs Monitoring Compliance with Best Forest Practice Standards by Region, Resource, or Condition Monitored and Number of States, 1997

Subject Area	Region (number of States)			Total
	North	South	West	
Water Quality	11	13	9	33
Riparian	10	11	9	30
Wetland	9	8	7	24
Soil Productivity	1	5	7	13
Wildfire, Insects & Diseases	3	1	9	13
Aesthetics	4	3	5	12
Wildlife Habitat	2	1	8	11
Reforestation	3	1	6	10
Cultural-Historic Resources	2	0	3	5
Recreation	2	0	2	4
Other	1	3	5	9

Source: Ellefson and others 2001a.

Forest practices most commonly monitored by States are those focused on water quality, riparian areas, and forested wetlands (Table 13). In 2000, the results of monitoring were found to be used in a variety of ways, including modification of education and training programs — 23 States, targeting of technical assistance programs — 20 States, and modification of existing guidelines — 11 States, and development of additional guidelines — 12 States (National Association of State Foresters 2001). The lead (or traditional) State forestry agency in only 20 States (in 1997) was the only agency engaged in monitoring compliance with recommended best forest practices (Ellefson and others 2001).

Local Government Capacity

Many local units of government have laws, rules, and guidelines that are significant contributors to forest sustainability (ordinances protecting special resources, limiting timber harvesting, preserving individual trees). Whether they have the capacity to actually enforce these laws, rules, and guidelines is largely unknown. In 1991, Hickman and Martus (1991) identified nearly 400 local ordinances regulating forestry practices, with more than 70 percent established since 1980 and half established since 1985. In 1993, Martus and others (1995) identified 522 local ordinances in 24 States regulating forestry activities, with 68 percent of them in Northeastern States and 27 percent in Southern States. In 1996, more than 100 local ordinances directing the application of forest practices existed in New York alone. As of 2000, county and municipal governments in 10 of the 13 Southern States had enacted a total of 346 forest-related ordinances (increase from 7 States and 141 ordinances in 1992), most of which were enacted in States experiencing rapid urban expansion (Forest Service 2001b).

The magnitude of local enforcement potential can be better judged in the context of the total number of local political jurisdictions within a State that could possibly adopt laws, rules, and guidelines addressing forest sustainability. In 1991, an estimated 8 percent of all local jurisdictions nationwide probably had forest practice enforcement potential. Such is based on the known frequency of forest practice regulatory programs at the local level in the following States: Colorado: 3 of 63 counties, Delaware: 1 of 3 counties, Florida: various of 57 counties, Georgia: 11 of 159 counties, Illinois: 100 of 1,200 municipalities, and 1 of 102 counties, Louisiana: 1 of 64 parishes, Maryland: 20 of 23 counties, Michigan: 10-15 of 1,200 townships, Minnesota: 1 of 87 counties, New Jersey: 300 of 567 municipalities and 15 of 21 counties, New York: 70 of 900 municipalities, North Dakota: 7 of 53 counties, Pennsylvania: 13 of 420 municipalities, Vermont: 2 of 251 municipalities, and Wisconsin: 3-4 of 1,500 municipalities, and 2 of 72 counties (Ellefson and others 1995).

State forest practice laws in some cases prohibit or severely restrict local governments from regulating forest practices. The argument being that many (potentially conflicting) regulatory jurisdictions can be an administrative burden to those owning land or operating businesses in many different parts of a State. Oregon's Forest Practices Act is quite specific in this respect, ". . . no unit of local government shall adopt any rules, regulations or ordinances or take any other actions that prohibit, limit, regulate, subject to approval, or in any other way affect forest practices on forest land." Idaho and Washington also restrict local governments from the development forest practice codes and their implementation via regulatory means.

Summary of Conditions

Enforcement of accepted forestry standards is often an important and necessary step in accomplishing societal interests in the sustainability of forests and the communities that depend on them. This review of institutional enforcement actions at Federal, State, and local levels of government suggests the following:

- Enforcement authority and necessary institutional capacity needed to accomplish standards of forest sustainability exists for nearly all State and Federal agencies that have responsibility for forests and related resources. However, the extent to which this capacity is exercised varies considerably within different levels of government and between different agencies. Enforcement authority is noticeably scattered among many different agencies of State government.

- Institutional capacity for enforcement is exercised in a variety of ways, ranging from preharvest reviews and postharvest inspections to fines and imprisonment, and from court-ordered injunctions to recovering the cost of repairing damaged resources through liens on private property. Because of diversity in resource, social and political conditions affiliated with forests, the range of enforcement mechanisms is purposely very broad. In some respects, coercion through incentives can be viewed as enforcement authority.

- Penalties associated with institutional enforcement capacity are also wide-ranging as is the extent of their severity. They include broad civil and criminal actions, provisions for fines and jail sentences, termination of actions by injunctions, rescinding of previously granted incentives, revoking of licenses and permits, and placement of liens on property for violations incurred. Largely unknown is the effectiveness of these penalties as a deterrent to landowners or timber harvesters that fail to cooperate in the application of sustainability standards.

- Enforcement authority and institutional capacity emanate from both environmental (for example, solid waste disposal) and public health (for example, toxic substances) law, as well as law that is specifically focused on forests and forestry practices. As relates to forests, there is substantial variation in the scope,

focus, and intensity of State and Federal agency enforcement capacity stemming from these different legal authorities.

- Institutional enforcement authority is very often designed and organized to be implemented in a targeted fashion. For example, enforcement actions are focused on specific sectors (private forests), geographic areas (riparian areas), forestry practices (clearcutting), pollutants (pesticides), and products or benefits (timber, wildlife). Enforcement authority and the intensity with which institutions apply it is not uniform across these target areas.

- Enforcement of laws, rules, and guidelines is often accomplished by the involvement of a third party through which government seeks to accomplish sustainability objectives without direct government action. Examples are the licensing, certifying, or registering of timber harvesters as to their understanding of acceptable forestry activities.

- Environmental pollution control law often exempts forestry or silvicultural activities from the standards and penalties specified therein, instead deferring to incentives, cost-sharing, or voluntary programs as means of accomplishing sustainable forestry objectives.

- Enforcement actions may defer to voluntary compliance with forest practice standards, rules, and guidelines, yet very often link voluntary actions to some enforcement mechanism. For example, compliance with best management practices may void the need for a permit, excuse compliance with a related law, or make operations immune from being defined as a nuisance.

- State governments in some cases have been extremely reluctant to adopt programs that rigorously and directly enforce the application of sustainable forestry practices. Instead, they rely on voluntary compliance with such practices, buttressed by educational and incentive programs. However, many States have addressed their distaste for regulation by adopting “bad actor” laws or “contingent regulation,” wherein enforcement is focused on the exceptionally uncooperative landowner or timber harvester.

- State governments have often limited their enforcement ability to sustainability standards specified by Federal law or regulation (for example, State “no-more-stringent” laws). Focused primarily (but not exclusively) on nonpoint sources of water pollutants, enforcement of State adopted standards that are more stringent than Federal standards are not allowed.

- Local units of government are often engaged in enforcement actions involving forest sustainability, although many States limit or prohibit local regulation. The extent and consequences of local regulatory enforcement of sustainable forestry practices is unsure.

Issues and Trends

The literature identifies a number of major issues and trends involving enforcement of standards required for sustainable forestry. Consider the following (Anderson 2000, Cabbage and Moffat 1997, Ellefson and others 1995, Ellefson and others 2001b and 2002, Environmental Law Institute 1997 and 1998, Ice and others 1997, National Association of State Foresters 2001, National Research Council 1998, Forest Service 2001b and 2002).

- Government agencies involved in the enforcement of standards of forest sustainability have increased dramatically over the past three decades. In most cases, each agency's enforcement authority is grounded in its responsibility for a single forest value (for example, air, water, wildlife), a situation that poses significant challenges to coordination within and between governments, and to understanding by landowners and timber harvesters of the often many different enforcement provisions.

- Legal frameworks supporting enforcement of standards of forest sustainability have been strengthened in recent decades with the establishment of a large number of Federal laws and regulations that directly or indirectly influence the forest practices of public and private landowners. These Federal laws have in many cases nurtured political and administrative environments within which State and local governments have sought and applied more rigorous enforcement authority.

- Management approaches of regulatory agencies and land management agencies have increasingly become divergent, often to the point of detracting from long-term interests in sustainable forestry. Land management agencies attempt to focus on long-term ecosystem and social needs (implementation of long-term strategic plans), while regulatory agencies tend to focus in the short term on individual proposed actions (for example, review permits, inspect projects).

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- Enforcement authorities of governments at different levels have increased in number and complexity, often imploring a need for more coordination and greater

clarification of roles and responsibilities. Such is especially true for the enforcement authorities of local governments that have increased in both number and intensity during the past three decades.

- State governments have increasingly become receptive to enforcement of standards of forest sustainability via authorities set forth in “bad actor” laws or “contingent regulatory” laws. Operating under such laws, landowners and harvesters do not have prior obligations to government (for example, to obtain a permit before harvesting). Enforcement is focused on only those landowners or timber harvesters who have already committed — or are in the process of committing — a violation of law or rules.

- Enforceable authority is increasingly being established for targeted areas where there is an apparent need for a better focus of enforcement authority and more explicit operating requirements for landowners and timber harvesters. Targeted areas include specially protected watersheds, estuaries and coastal waters, wild and scenic rivers, fish and wildlife habitat, and specially designated waters that are considered impaired.

- States are increasingly limiting the expansion of regulatory enforcement via State laws that prohibit adoption of standards that are more stringent than Federal standards for forestry, natural resources, or environmental protection generally. A major implication of doing so is a decrease in the legal and administrative flexibility needed to address issues of sustainability that are unique to a State.

- Enforcement authorities emanating from forest law and from broad environmental law have increasingly come into conflict as environmental agencies more aggressively pursue enforcement of environmental statutes. This is especially so for enforcement authorities involving nonpoint source water pollution.

Information Adequacy

Specification

Information about the institutional capacity for enforcing laws, rules, and guidelines that are considered important to forest sustainability have periodically been the focus of various public and private organizations. In 1999, the National Association of State foresters (1999) sought a better understanding of State forestry agency information concerning institutional enforcement capacity. The association reported 6 States with an abundant amount of information concerning enforcement of laws, rules, and guidelines and 19 with sufficient information for describing

enforcement activities. Somewhat troubling was that 21 States had no information concerning the enforcement of laws, rules, and guidelines. As for the quality of information, 8 States reported it was excellent, 19 adequate, and 5 reported poor quality information (National Association of State Foresters 2001).

Although certainly not exhaustive, the following are information gathering suggestions that might prove useful to securing a better understanding of the institutional capacity that is necessary to enforce standards of forest sustainability and conservation.

- *Measurement Information* — Information about which variables and how they should be measured so as to accurately portray conditions involving institutional enforcement capacity has not been assembled (What conditions should be measured and subsequently compiled [for example, personnel per unit area, area of forest covered, number of landowners and harvesters involved, rate of compliance with standards, rates of fines or duration of prison sentences, open cases pending administrative or judicial review]? What conditions to be measured are the best indicators of accomplishing enforcement of agreed to standards of sustainable forest management? How often are these variables to be measured? Are there special measurement needs associated with different types of enforcement activity?)

- *Extent of Enforcement Activity information* — Information about the expanse of institutional enforcement capacity has been assembled in an often uncoordinated way, the result of which is information that depicts only current conditions, and lacks local, regional, and national consistency (What are the legal mandates for enforcement at various geographic levels and by various organizations? How are these requirements changing over time [if at all]? Are there differences in requirements at different levels of government? Is there consistency across these requirements? Are their legal and constitutional issues at stake between governments? Exactly how much enforcement is occurring [number of violations, judicial injunctive relief, prosecutions, Federal contract violations] and what is its focus [by forest benefit, landowner category]? How much is being invested in enforcement [financial, personnel, equipment]? What are requirements for employment in enforcement programs [basic, specialized, continuing education]? What is the status of local government enforcement programs [extent, reason for proliferation]? Are compilations as currently carried out useful for guiding policy and program direction? Is there a need to expand centralized reporting systems for enforcement [LOOT system, LEMARS system, reporting county and municipal enforcement activities]?).

- *Responsible Organization Information* — Information about what organizations are actively engaged in enforcement activities has not been assembled except in a very modest way (What government agencies and at what levels are they engaged in enforcement? What legal authority assigns them responsibility and is such authority being accurately interpreted? Do different public organizations

engaging in code development have similar or differing goals and objectives that foster or hinder code development and implementation? Do private organizations have a role in enforcement and, if so, what is its nature and what prompted such involvement [favor self-regulation]? Are there organizational patterns in the public and private sector that, if known and publicized, would enhance overall enforcement of standards of forest sustainability?)

- *Coordination information* – Information about requirements to coordinate enforcement activities among and between various levels of government has not been assembled (What conflicts exist between the various entities engaged in enforcement? How might they be productively resolved? What are requirements for coordination? Do they allow for cross-sectoral, coordinated planning and review? Do they ensure that the cumulative results of local, State, and regionally undertaken enforcement will lead to outcomes consistent with national requirements and vice versa? Do they allow incorporation of ad hoc enforcement activities occurring at various times and undertaken by various levels of government?).

- *Procedure and Specification information* -- Information about how enforcement standards and procedures are best developed and implemented has not been assembled (Do current statutory requirements prescribe procedures for developing enforcement actions and their implementation? Is such in a detailed format or in a broad framework giving deference to administrators and rule making procedures? Is the full intent of the existing laws that require enforcement expressed in current rules and administrative procedures? Do national requirements for enforcement allow for regional and subregional development of enforcement actions? Do requirements specify the need for leadership in their development? Do they give guidance to such leadership?).

- *Scope of Enforcement Information* — Information about enforcement activities frequently focuses on wildlife and water quality, failing to comprehensively assess enforcement focused on other forest benefits (What enforcement capacity exists for the range of values associated with forests? What approaches have been used to encourage development and application of enforcement actions focused on this broader range of benefits? What legal requirements require enforcement of sustainability standards for the broad range of values associated with forests? Do these legal requirements differ among agencies at the same level of government and between levels of government? Are these differences complementary or competitive? Are their barriers to developing and implementing enforcement actions in addition to those focused on water and wildlife? If so, how might they be overcome?)

- *Investment and Incentive Information* — Information about resources devoted by various institutions to enforcement activities has not been assembled except in some very limited cases (What is the magnitude of investment in enforcement activities? Are there legal and administrative processes for allocating resources to

these activities and are they sufficient? Are there provisions [legally or fiscally] for encouraging these activities, especially encouraging cross-sectoral development and implementation of enforcement activities?).

- *Alternative Types of Enforcement Information* — Information about the appropriateness of various different types of enforcement actions has not been compiled except in isolated State or regional circumstances (What is the array of enforcement actions [for example, fines, imprisonment, revoke a permit, cease and desist orders] that might be undertaken to ensure application of sustainability standards? What is the relative efficiency and effectiveness of these approaches in fostering landowner and timber harvester application of them? Are certain categories of landowners and timber harvesters more apt to respond to certain types of enforcement actions? What is the appropriate scale and administrative design for successful implementation of an enforcement program?)

- *Effectiveness information* — Information about the effectiveness of various approaches to enforcement and their ability to accomplish sustainable forestry interests has not been compiled (Are there legal or administrative requirements to determine efficiency and effectiveness of different ways of conducting enforcement activities? What are appropriate measures of success? Is the scale of enforcement programs a deterrent to effectiveness [appropriate budget and personnel]? Are there more effective approaches to accomplishing desired outcomes from enforcement [fiscal incentives, technical assistance]? What opinions do stakeholders and interest groups have of enforcement actions?).

- *Monitoring information* — Information about the monitoring of enforcement programs and activities has not been assembled (Are their legal requirements to monitor the results of enforcement activities? Is the information from monitoring activities being used to adapt enforcement actions to changing circumstances? Is the information being collected and analyzed in such a way to be useful to fulfilling legal requirements assigned to an enforcement agency? Are monitoring programs statistically well designed? What is being done to monitor administrative processes used to manage enforcement programs?)

Recommendations

The ability to influence forest sustainability will depend a great deal on consistent, long-term enforcement of standards associated with forest sustainability and conservation as suggested by Indicator 57. In order to improve the institutional setting within which such will occur, there are a variety of information voids that need to be addressed (many described directly above). In order to suitably deal with them, the following actions would seem appropriate.

- *Comprehensive periodic reviews.* Conduct periodic and comprehensive reviews of the institutional capacities that give direction and resources to enforcement of laws, rules, and guidelines. Guided by the above suggested information deficiencies, the reviews should give special attention to the collection of information concerning the different types of enforcement activities, organizations that implement them, and the effect of enforcement actions on the accomplishment of desired forest values. This information should be gathered to the extent it occurs at Federal, State, and local levels of government. Special attention should be directed to information about local (county and municipal) enforcement activities which appear to be expanding at a rapid rate.

- *Responsibility for conducting reviews.* Since no single source of information exists on forest-related enforcement activities, assign responsibility for conducting reviews (on a continuous basis) of these activities to a specific (current or new) administrative unit located within a Federal agency (Forest Service's Law Enforcement and Investigations Unit, State and Private Forestry, or Research and Development), a college or university, or other nonprofit organization (for example, National Association of State Foresters). This responsibility should be assigned to an organization that has a proven track record in addressing the complexities of developing and implementing enforcement programs involving forests and their sustainability.

- *Devote resources to reviews.* Invest in the review sufficient resources (financial and personnel) as are necessary to provide the type and quantity of information necessary to dramatically improve understanding of current abilities to develop and implement enforcement actions considered important to sustainable forestry.

Indicator Appropriateness

Indicator Definition

Unclear definition of certain activities specified by Indicator 57 is troublesome, especially the elusiveness of the indicator's major descriptive words and phrases, namely "enforces" and "guidelines." These words or phrases supposedly are

grounded in an agreed to set of concepts and principles that serve as a useful guide to information gathering efforts. For this indicator, such is not always the case as is highlighted by the need to set forth definitions earlier in this review. The word “enforce” is taken to mean “. . . compel conformity with some standard . . . ,” a definition that is not at all appropriate when focused on “guidelines” (enforce guidelines) as they are currently understood in the United States. Guidelines in the U.S. are generally viewed as standards (criteria, touchstones or benchmarks) to be voluntarily complied with by landowners and timber harvesters. Only if guidelines are viewed as being coercive (adopted in response to fiscal incentives or technical information) should they be thought of as part of enforcement activities. Confusing the issue is that the term “enforcement” is widely associated with laws and regulations that make certain actions mandatory, whereas the term “incentives” is typically associated with guidelines in a voluntary sense. Suggested is that the wording of Indicator 57 be changed to “*enforce laws and regulations and assure implementation of guidelines,*” as has been suggested elsewhere (Roundtable on Sustainable Forestry 1999).

Cross-Cutting Conditions

Crosscutting indicator issues involving Indicator 57 are frequent, particularly as they relate to concepts involving laws and values, public participation, funding, and planning. Among the potentials for difficulty in this respect is Indicator 57's relationship to Indicators 40 (extension and use of new technology), 51 (best practice codes), 54 (planning and coordination), 58 (investment in forests), 60 (information and data), and 66 (human intervention impacts). Such are obvious sources of crosscutting implications for Indicator 57. Even though the information gathering focus is different for the two indicators (legal versus institutional capacity), consideration should also be given to merging Indicator 57 and Indicator 51 (best practice codes). Conceptually they have much in common and the information describing both of them frequently has relevance to best practice codes and the enforcement of such codes.

Literature Cited

Anderson, S. 2000. A Short History of Best Management Practices. Presentation to Oregon Society of American Foresters Annual Meeting (May 19, 2000). Forest History Society. Durham, NC.

Alden, A., and P. V. Ellefson. 1997. Natural Resource and Environmental Litigation in the Federal Courts: A Review of Parties, Statutes and Circuits Involved. Staff Paper Series Number 125. Department of Forest Resources. University of Minnesota. St. Paul, MN.

American Forest and Paper Association. 1994. *Federal Laws and Regulations Affecting Private Forestry*. Washington, DC.

Callicott, J. B. 2000. Aldo Leopold and the Foundations of Ecosystem Management. *Journal of Forestry* 98(5):15-22.

Carnett, C. 1991. Legal Background of Archeological Resources Protection. Archeology and Ethnography Technical Brief No. 11. USDI National Park Service. Washington, DC.

Coggins and Wilkinson 1990. *Federal Public Land and Resources Law*. Foundation Press. New York, NY.

Cubbage, F. W., and S. O. Moffat. 1997. Criterion Seven, Indicator 51: A Review and Discussion. Unpublished Document. Southern Research Station. Forest Service. New Orleans, LA.

Ellefson, P. V., A. S. Cheng, and R. S. Moulton. 1995. *Regulation of Private Forestry Practices by State Governments*. Station Bulletin 605-1995. MN Agricultural Experiment Station. St. Paul, MN.

Ellefson, P. V. 2000. *Has Gifford Pinchot's Regulatory Vision Been Realized?* *Journal of Forestry* 98(5):15-22.

Ellefson, P. V., M. A. Kilgore, and M. J. Phillips. 2001a. Monitoring Compliance with BMPs: Experience of State Governments. *Journal of Forestry* 99(1):11-17.

Ellefson, P. V., R. J. Moulton, and M. A. Kilgore. 2001b. Programs and Organizations Affecting the Use, management, and Protection of Forests: An Assessment of Agencies Located Across the Organizational Landscape of State Governments. Department of Forest Resources. University of Minnesota. St. Paul, MN.

Ellefson, P. V., R. J. Moulton, and M. A. Kilgore. 2002. An Assessment of State Agencies that Affect Forests. *Journal of Forestry* 100(6):35-42.

Environmental Law Institute. 1997. *Enforceable State Mechanisms for the Control of Nonpoint Source Water Pollution*. Washington, DC.

Environmental Law Institute. 1998. *Almanac of Enforceable State Laws to Control Nonpoint Source Water Pollution*. Washington, DC.

Hickman, C.A. and C.E. Martus. 1991. Local Regulation of Private Forestry Practices in the Eastern United States. In: Proceedings, 1991 Southern Forest Economics Workers Meeting. Department. of Forestry. Louisiana State University. Baton Rouge, LA. Pg 73-90.

Ice, G. G., G. W. Stuart, J. B. Waide, L. C. Irland, and P. V. Ellefson. 1997. Twenty-five Years of the Clean Water Act: How Clean Are Forest Practices? *Journal of Forestry* 95(7): 9-13.

Jones, E. S., and C. P. Taylor. 1995. Litigating Agency Change: The Impact of the Courts and Administrative Appeals Process on the Forest Service. *Policy Studies Journal* 23(2): 310-336.

Kerwin, C. M. 1999. *Rulemaking: How Government Agencies Write Law and Make Policy*. Congressional Quarterly Press. Washington, DC.

MacKay, D. G., P. V. Ellefson and C. R. Blinn. 1996. Registration, Certification and Licensing: Creating Better Timber Harvesters. *Journal of Forestry* 94(7):27-31.

Martus, C. E., H. L. Haney, and W. C. Siegel, W.C., 1995. Local Forest Regulatory Ordinances: Trends in the Eastern United States. *Journal of Forestry* 93(6):27-31.

National Archives and Records Administration 2001a. Federal Register (1997 through October 2001). Washington, DC.

National Archives and Records Administration 2001b. Codification of Proclamations and Presidential Executive Orders. Title 3 of the Code of Federal Regulations. Washington, DC.

National Association of State Foresters. 1999. First Approximation Assessment Report. Washington, DC.

National Association of State Foresters. 2001. State Nonpoint Source Pollution Control Programs for Silviculture Sustained Success. Washington, DC.

National Conference of State Legislatures. 2001. State Statute Forestry Citations. (www.ncsl.org). Denver, CO.

National Research Council. 1998. *Forested Landscapes in Perspective: Prospects and Opportunities for Sustainable Management of America's Nonfederal Forests*. National Academy Press. Washington, DC.

Roundtable on Sustainable Forestry. 1999. Criterion Level Summary: Indicators 48-59 Criteria Technical Committee (CTC). Washington, DC.

U.S. General Accounting Office. 1994. Federal Lands: Land Acquisitions Involving Nonprofit Conservation Organizations. GAS/RCED-94-149. Washington, DC.

U.S. General Accounting Office. 1995. Federal Lands: Information on Land Owned and on Acreage with Conservation Restrictions. GAO/RCED-95-73FS. Washington, DC.

Forest Service 1993. *The Principle Laws Relating to Forest Service Activities*. Washington, DC.

Forest Service. 2000. Law Enforcement and Investigations: FY2000. Forest Service Law Enforcement and Investigations. Washington, D. C.

Forest Service. 2001a. Law Enforcement Handbook. FSH 5309.11. (www.fs.fed.us). Washington, DC.

Forest Service. 2001b. Southern Forest Resource Assessment. Southern Research Station. Asheville, NC.

Forest Service. 2002. The Process Predicament: How Statutory, Regulatory and Administrative Factors Affect National Forest Management. Washington, DC.

USDI Bureau of Land Management. 2001. Safety on Public Lands: Protecting You and Public Resources. (www.blm.gov). Washington, DC.

USDI Fish and Wildlife Service. 2001. Division of Law Enforcement: Annual Report FY 2000. (www.fws.gov). Washington, DC.

USDI National Park Service. 2001. Law Enforcement in the National Park System. (www.nps.gov). Washington, DC.

Wasby, S. L., 1983. Interest Groups and Litigation. *Policy Studies Journal* 11(4): 697-670.

West Publishing Company 1997. *Selected Environmental Law Statutes*. St. Paul, MN.