

Forest Practices and Quality Water from  
Private Forest Lands: Legislative  
and Educational Opportunities

by

Paul V. Ellefson<sup>1</sup>

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<sup>1</sup> Associate Professor of Forest Economics and Policy, Department of Forest Resources, College of Forestry, University of Minnesota. Staff papers are published without formal review within the Department of Forest Resources.

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Private forest landowners have in the past 4-5 years been confronted by unprecedented demands to improve the quality of water which flows from their land. The spark which ignited these demands lies primarily with the aggressive efforts of the Environmental Protection Agency (EPA) to implement the many and often complex requirements of the 1972 Amendments to the Federal Water Pollution Control Act (12). For private forest landowners and the professionals on whom such landowners rely for management advice, these Amendments have precipitated in the minds of many an opportunity to improve levels of forest management. To a like number, these Amendments have raised substantial concern over potential adverse impacts on forestry in the private sector. For all, however, the Amendments have surfaced serious consideration of the many and often complex problems that must be faced if we are earnest about maintaining or restoring flows of high quality water from forest land.

The Amendments to the Federal Water Pollution Control Act direct our attention to control of pollutants resulting from silviculture activities and to the development of guides and planning processes that states can use in identifying, evaluating, and controlling nonpoint

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sources of water pollution from privately owned forests. A closer examination of these assignments reveals their complex nature and points to the difficult task of designing government programs that can effectively cope with such matters. For example, water pollution is tremendously diverse in character--it ranges from adverse changes in water temperature to undesirable levels of dissolved oxygen, and from unusually heavy sediment loads to deadly residuals which often result from pesticide use. Too, water pollution can be traced to a variety of causes including lack of reforestation, poorly designed roads, improperly executed harvesting plans and indiscriminate use of chemicals. To say that water pollutants originate from "nonpoint sources" is not enough. We must be more specific. Likewise we must not generalize in our assumptions about the complex relationships that exist between forest management practices--or lack thereof--and the type and severity of the water pollution observed. Identifying such relationships and setting forth forest policy which recognizes them is especially challenging to those charged with recommending legislation and administrative programs that will effectively combat water pollutants. Consider for example, a prohibition on herbicides. At first blush such action would appear to have a positive impact on water quality, namely, keep harmful herbicides out of waterways. But if eliminating such chemicals means that a timber grower must resort to mechanical scarification as the next best means of site preparation, the resulting increase in water born sediment may prove even more destructive to water quality than the chemical residues themselves. In a like manner, reducing the size of clearcuts would appear to be an effective means for securing a very positive impact on

water quality. Quite possibly, however, the sediment from the added roads needed to reach smaller, more numerous, and more widely disbursed clearcuts could easily result in a net reduction in water quality.

Goals of achieving, or maintaining quality water from private forest lands are laudable indeed. But such will not be realized without a thorough understanding of the complexity of forest practices and their potential impact on water quality. Without such an understanding, attempts to devise laws and programs for securing quality water will be frustrated, and the goals we aspire to achieve will for the most part go unchallenged.

### Current Major Issues

The Amendments to the federal water pollution control act have surfaced many issues which private owners of forest land must address (6). Three are especially timely and thus worthy of brief note. First there is apprehension over Section 404 of the Amendments. This section authorizes the U.S. Army Corp of Engineers to issue permits "...for the discharge of dredged or fill material into navigable waters at specified disposal sites." Court interpretation of "navigable waters" has extended Corp jurisdiction beyond navigable waters as traditionally defined. Regulations now cover virtually all waterways and adjacent wetlands. Permits are required for forestry activities such as construction of roads, dikes, and drainage ditches in wet forest lands; installation of culverts and bridges; and the building of ponds in wetland areas or impoundment of "navigable" waters. Congressional debate and proposed legislation focused on this onerous permit program during 1976. A solution acceptable to the parties involved in the issue has yet to materialize.

Likewise of concern to private owners of forest land are regulations addressing silvicultural point sources of water pollution. Again in response to a court directive, the Environmental Protection Agency defined and set forth regulations addressing point sources of water pollution in the "silvicultural" category. Permits are now required for rock crushing and gravel washing, and for log sorting and storage if these activities result in the discharge of "pollutants" through a "confined and discrete conveyance" into "navigable waters". Tree growing and harvesting activities continue to be viewed by EPA as nonpoint sources,

and thus are not subject to the point source permit program. Regulation of silvicultural point sources will probably have limited impact on owners of small forest acreages. Industrial owners of large forest acreages will most likely bear the brunt of this regulatory program.

The Ammendments' Section 208 is a third area of concern to private forest owners. This section requires state preparation of Areawide Waste Treatment Management Plans for both point and non-point sources. Such plans must include "a process to (i) identify, if appropriate, agriculturally and silviculturally related nonpoint sources of pollution, ....and (ii) set forth proceedures and methods (including land use requirements) to control to the extent feasibile such sources." Under court direction, EPA has issued regulations requiring state preparation of plans for every area within a state. Non-point silvicultural sources of water pollutants will be curtailed by application of "best management practices." The later must respect local differences in forest conditions and must be based on technical and economic considerations consistent with state and local government needs. Section 208 requirements have yet to be fully implemented. In all likelihood, however, this section of the Ammendments may well prove to be most influential on forest practices prescribed by private owners of forest land.

### Alternative Programs

The design and selection of policies that will encourage forest practices which impact favorably the quality of water flowing from private forests is no simple task. A first and prime requisite is accurate identification of those practices which do adversely impact water quality. For example, are private forest landowners designing, constructing, and maintaining forest roads in manners that are causing unacceptable levels of sediment in streams? If this is the case, what road standards are conducive to production of quality water and what government programs might one devise for compelling landowners to follow such standards? Might we inform them of a better road design via some government educational program? Would we be better off to pay the owners a subsidy so they become financially capable of building better roads? Or might we require them by force of law and fear of penalty to build roads of the type which are less water polluting? These alternatives must be carefully assessed, and only that program--or combination of programs--found to be efficient, effective, and politically acceptable should be selected for implementation.

There are many government programs that can be looked to as means of encouraging or "delivering" to the private landowner the forest practices thought important to achieving quality water. There categories stand out, namely,

- regulation of private landowner forest practices, (e.g., state forest practice acts)
- educational programs (e.g., extension forest programs and service forestry programs)

- subsidy programs (e.g., incentive payments and tax relief)

A few words about each of these alternatives seems in order.

### Regulation of Forest Practices

Prohibiting private forest landowners from using forest practices thought undesirable or requiring landowners to undertake practices which are viewed as desirable are not new policy tools for government. Public regulation of private forest practices is certainly not new to European countries (8). In the mid 1600's, German law limited timber harvesting to short periods during which a crescent moon existed--such periods were believed to enhance the durability of the wood that was to be harvested. Interestingly, these and other such requirements were read from the pulpit to churchgoers twice each year. In the United States, debate over expected timber shortages gave rise to calls for public regulation of private forest practices on many occasions during the twentieth century (2). Federally, such regulations never did materialize. Instead, cooperative forest management programs were established via federal laws such as the Weeks Act, the Clark-McNary Act and the Cooperative Forest Management Act (5). With the advent of heightened concern over the state of natural environments in the 1970's; public regulation again surfaced as a policy to be seriously considered. This time it was advocated as a means of addressing a variety of environmental ills, especially those revolving around water quality as related to forest practices (4).

State laws focusing on regulation of forest practices are numerous--many were enacted some years ago as a preventive measure against federal regulation. All states have laws addressing some aspect of forestry--be it fire prevention or matters of trespass. Seventeen states have legislation focusing directly on silvicultural practices and cutting

methods (3). Items most frequently addressed by these laws are limits on the diameter of trees to be cut and the leaving of seed trees that will foster reforestation. Most widely discussed of the state forest practice acts are those currently in effect in California, Oregon, and Washington. Enacted within the past 5 years, the forest practice acts of these states are in many respects serving as prototypes for other states. Indeed, it is not by accident that a model state forest practice act suggested by the Environmental Protection Agency is similar to the forest practice laws of these Western states (1).

The Oregon Forest Practices Act was established by law in 1971. The Act is enforced by the State Forester with the guidance of a State Forestry Board and three regional committees. The Board is responsible for developing minimum forest practice standards for five different categories of forest practices, namely, reforestation, road construction, harvesting, application of chemicals, and slash disposal. The regional committees tailor forest practice requirements to local conditions within these standards. Private forest landowners intending to undertake a forest practice must notify the State Forester to potential problems. To assure compliance with the standard, employees of the State Forester make periodic inspections of the forest landowner's progress.

Violations of the Act's provisions brings forth the possibility of a series of penalties. The State Forester can order operations to cease, take violators to court where fines may be imposed, or can order that corrective action be taken by the landowner. If such an order is ignored, the State Forester can undertake work necessary to make the practice meet the appropriate standard and then assess the private

landowner accordingly. During the first two years of the Act's existence, 22,000 notifications were received by Oregon's State Forester and 15,000 inspections were made. A total of 254 noncompliance citations were issued, 60 percent of which required landowners to take remedial action (9).

The California Forest Practice Act--which took effect on January 1, 1974--is in many respects very different from that found in Oregon. Similar in terms of establishing a forestry board, setting up regional forest districts, and placing enforcement authority in the office of the state forester, the laws part ways in terms of the means by which they are enforced. Where Oregon law employs a notification system (e.g., "I plan on undertaking such and such a forest practice"), the California law follows a permit system (e.g., "May I undertake such and such a forest practice?")

California's permit system requires a private landowner intent on conducting timber harvesting operations to apply in advance to the State Forester for a permit to do so. A timber harvesting plan prepared by a registered professional forester must accompany such a request. The state Forester makes an on-the-ground inspection prior to issuing the permit. Upon completion of the operations, the landowner must notify the state forester of such, and must then await another follow-up inspection. The landowner or operator must also--within five years of completing the operations--file a report which specifies whether or not the area harvested has achieved satisfactory stocking levels. The latter are specified as being at least 300 trees per acre and an average basal area of 85 square feet. Penalties for noncompliance with the act are

similar to those found in Oregon. The State Forester can revoke permits, and order operations to cease harvesting, or direct the operator to make corrections necessary to achieve the specified forest practice standards. Violations of the law are a misdemeanor subject to maximum fine of \$500 and imprisonment. Since the forest practice standards were set forth by the California Forestry Board and the regional committees in 1975 sufficient time for an evaluation of the Act's performance has not yet elapsed. Without doubt the law's effectiveness will be subject to careful scrutiny in the years ahead.

The Washington Forest Practice Act is the third regulatory law of major recent interest to the forestry community. Enacted in 1974, the law also established a State Forest Practices Board and related regional forest practice committees, and vests authority for its administration with the state Department of Natural Resources. The state's forest practice standards--adopted July 1976--are the result of a joint effort of the Department of Natural Resources and the state's Department of Ecology. The latter's involvement in establishing these standards stems from its authority to enforce statewide water quality standards. Forest practices are placed in one of four categories, depending on their environmental impact (e.g., "no potential for damage," "less than ordinary potential for damage," "potential for substantial impact"). Minimum stocking standards, harvesting standards and the like are set forth for each of the classes. Depending on which class a planned forestry activity falls into, a landowner or operator is required to either notify or obtain a permit from the State Forester. Those practices thought to impact the forest environment in a major way require a

permit before work can begin. If such be the case, the application for a permit must be accompanied by a description of the silvicultural and harvesting methods to be employed and the provisions that will be made for reforestation. Violation of the Act's requirements are considered a misdemeanor carrying civil penalties of up to \$500 per day and criminal penalties of fine and imprisonment.

These three relatively new state forest practice acts have established a yardstick--be it good or bad--against which proposed acts in other states are being judged. The acts are new and time for thorough evaluation of their effectiveness has not yet elapsed. Until then, a word of cautious optimism is all that seems in order regarding the use of forest practice acts by other states in their attempt to cope with water quality matters. On a positive note, we are fortunate that three Western states have taken the plunge into the modern era of regulation--we can learn much from their experiences and would be shortsighted if we did not attempt to do so.

Regulations as a means of compelling private forest landowners to undertake practices thought necessary for quality water has its difficulties. One need only consult a standard college text on forest policy to become acquainted with listings of these problems (14). Two problems seem worthy of highlighting here. Forest regulation presumes private forest landowners are financially capable of accomplishing the practices expected of them by law. If they are not--as is probably the case with many owners of small woodlots--regulation can prove to be a financial hardship which discourages sound forest management or leads to owner disposal of his forest land (7). . . Likewise, the cost of

administering a regulatory program can prove to be a major burden. Oregon's experience to date indicates that the cost of enforcing its forest practices act has been largely at the expense of other forestry programs--especially service type forestry programs (11). Proposals for any regulatory programs should clearly state the cost of administering them. Not to do so would be to play a dishonest game with elected political figures who must sanction enactment of a forest practice law.

What guidance can be given in developing a state forest practices act if such a policy tool is chosen? One source is the Society of American Forester's "Criteria for a Competent State Forest Practices Act" (10). Among the twelve criteria so stated are, forest practice acts should:

- make no attempt to specify in law statewide forest practice standards;
- allow private landowners and forestry professionals latitude for prescribing forest practices so as to meet local conditions;
- allow for the use of public hearings as a source of information in developing forest practice standards;
- be coordinated with related regulatory programs so that agency conflicts and administrative costs can be minimized;
- have boards and commissions which represent a broad range of the public;
- make no attempt to prohibit the "legitimate" conversion of forest land to other uses; and
- not impose administrative requirements which may be unduly

burdensome to the private forest landowner and operator.

This last criteria is worth highlighting. Private forest landowners and operators should have the pleasure of looking to only one agency for the regulations that will guide their conduct. Authority to establish and administer forest practice acts by a number of agencies can be frustrating to the private landowner and can lead to dual and possibly divergent administrative views. The dilemma that can occur is well stated by Weyerhaeuser's Mr. Jack Wolff in recent comments about the Washington state situation:

"...a given forest practice operation could be subject to regulation by local government under shoreline management, regulation by the State Fisheries and Game Departments under the State Hydraulics Approval Act and finally, regulation by the Department of Natural Resources under the State Forest Practices Act" (13).

A dilemma indeed! Private forest landowners should be able to seek out one responsible agency, and should be assured that if forest management operations are conducted in accordance with the forest practice regulations adopted by that agency, all requirements of the law pertaining to soil sediment and air and water quality will have been met. Such an administrative arrangement would be looked on with much favor by private forest landowners, and would be a definite plus for efficient government.

As stated earlier, regulation of forest practices by law is only one of many mechanisms available for securing forest practices necessary to water of high quality. A variety of often overlooked educational and subsidy programs are also available for use. They definitely should be scrutinized by states contemplating programs to enhance the quality of water flowing from privately owned forest lands within their boundaries.

### Educational Programs

Educational programs come to immediate mind as a viable means of attacking water quality problems. There exists a strong suspicion that poorly applied forest practices leading to a lowering of water quality may be the result of landowner ignorance. An effective educational effort aimed at identifying for the landowner the practices which encourage pollutants in water, and subsequently informing him as to how such practices ought to be undertaken, might just eliminate this ignorance. Effective programs are already in existence for accomplishing this educational task. The forest extension arm of land grant universities and the on-the-ground technical assistance of some 900 service foresters as authorized by the Cooperative Forest Management Act are cases in point. These programs have the capability of providing landowners and operators advice and technical assistance on matters such as the location of roads, culverts and waterbars, the preparation of timber harvesting and regeneration plans, the use of logging equipment least likely to encourage stream sediment, and the judicious use of chemicals. Knowledge of this type in the hands of the receptive landowners and operators can strike a very real blow at water pollutants originating from forest land.

Education programs concerning nonpoint sources of water pollution on forest land should also be a vital part of the training of foresters, and should be included in the continuing education efforts of all natural resource managers. Regardless of the audience--forestry professional or the layman landowner--we definitely need to explore further the efficiency and effectiveness of educational programs as a means of conveying knowledge required for improving or maintaining water quality.

Incentive or Subsidy Programs

Subsidies or incentive payments are another alternative which should be considered as a means of coping with water quality problems thought to originate from certain forest practices. Private forest landowners and operators who are aware of the forest practices which enhance water quality, but who find that for financial reasons they are unable to undertake such practices, would be prime targets for subsidy payments. The program framework for such payments already exists in the Forestry Incentive Act--a federally funded law that is administered for the most part by state foresters. Broadened to include water quality practices for private forest land, this Act and the programs it authorizes might--on a cost-share basis--achieve excellent progress toward the adoption of water bars on logging roads, seeding of cut banks and log landings, and the blocking and seeding of abandoned logging roads. Although the Forestry Incentive Act is a federal law, state counterparts could be considered. Two states, Virginia and Mississippi, currently have such laws. They provide cost-sharing payments to private landowners--such payments are financed by a tax on forest products.

As do regulation and education programs, subsidies offer yet another means by which government can act to encourage forest practices which will enhance the quality of water flowing from private forest lands. It would be possible to develop a coordinated program that would entail use of all or parts of each alternative just described. However, it would be shortsighted to think in terms of a "best" combination to be followed by all states. Each state must examine the pros and cons of regulation, education, and subsidies within the context of their own

forest resources and the politics of their own citizens. Only then can it select a package that is consistent with its citizen's expectations for quality water.

### Research

A discussion of legislation and related programs which focus on quality water from forest lands would not be complete without a word about the need for research. For the professional charged with designing and implementing various means of achieving water quality goals, there has arisen a multitude of questions. They tend to focus on the following: is it physically and technically possible to achieve water quality goals, is it economically prudent to strive for them by one means or another, and are the steps that might be taken to achieve them politically palatable? In some states for example, efforts to implement a planning process aimed at controlling nonpoint sources of water pollution might surface questions such as: To what extent is there a problem with water pollution originating from management practices prescribed for forested land? What types of water pollutants originate from such practices, how widespread are they geographically, and what technology would be required to evaluate and curb such pollutants so as to secure an "acceptable" level of water quality? Also, what public and private costs are associated with achieving various levels of "acceptable" water pollution from privately owned forest lands, and are these commensurate with the benefits that would accrue to the users of the higher quality water? And what are the most efficient and politically equitable means of encouraging private forest landowners to use those forest practices that are most conducive to securing the desired water quality? State forest practice acts have been suggested in this respect--are they the "best" means or should we be looking at other routes to achieve the same objective? These questions and many

more could be asked. For forestry professionals and landowners alike there appear to be far more "unknowns" about achieving or maintaining water quality water than there are "knowns." Research can and should be undertaken to reduce the extent of this uncertainty.

Summary

In conclusion, the need to get on with the job of designing programs that will foster renewed or continuing flows of high quality water from forest lands is upon us! The 1972 Amendments to the Federal Water Pollution Control Act have seen to that. Basic to the design of effective water quality programs will be their recognition of the complex and diverse nature of the pollutants and the forest practices that we are dealing with. A simple solution will not do. We must also keep in mind the many government programs which can be called upon to encourage the production of high quality water from privately owned forest lands. As a start, we might find it most prudent to look first to the educational programs that are available. If such programs fail to secure the results we think to be satisfactory, our attention could logically be directed to subsidies. If both of these programs prove to be disappointments, the regulatory route must be considered in all seriousness. Most likely, however, we will find a combination of these program areas to be most effective. And finally, selection of the "best" means of managing for quality water must be founded on a thorough understanding of water pollutants and the practices and programs that can be used to keep such pollutants at acceptable levels. This understanding will only come through rigorous research.

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