

THE BACKGROUND OF STATE FOREST PRACTICE LEGISLATION AND ITS
IMPACT UPON FOREST LAND USE AND MANAGEMENT

by

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1. INTRODUCTION

1.1. Problem

State regulation of private forest-management practices is a live topic in the U. S. today. Such forest practice regulation is generally viewed as part of the whole state and local control over individual action that many persons consider essential if the community is to enjoy, and not suffer from, social development. Many other persons view regulation negatively because they want to cling to their old freedoms.

In the 1930s, the live topic was federal regulation, because the great issues were nationwide depression, monetary and fiscal policy and practice, interstate commerce, and international relations. In the 1970s, federal regulation has not lost its interest, but much attention has shifted to state and local governments, because so many of the issues are approachable socially through powers reserved to the states. Among the major issues are safeguarding the quality of life in the face of population and land-use pressures and the threat of every sort of pollution.

Public concern over state forest-practice laws was greatly heightened when, in 1974, the Environmental Protection Agency commenced work on a "model bill" that would be referred to the Council of State Governments and, it was hoped, ultimately approved by the Council. Drafts of the model were produced in 1974 and 1975 and stirred up much discussion and even controversy. EPA took the position that forest practices (primarily logging) would be regulated as a nonpoint source

of water pollution. Many persons took the view that forest conditions were too variable among the states to permit the writing of a single prescription for all. And indeed, as will be made clear shortly, some of the states had already taken matters into their own hands and had passed or begun work on their own regulatory laws aimed at pollution abatement.

1.2. Purpose

The purpose of this report is to examine the experience of the states that have passed substantial forest practice legislation: What led each state to become interested in forest practice regulation? What were the chief interest groups? Where did they stand on the regulation issue? Why? What provisions were adopted? Why? What has been the state's experience with its law? What have been the costs and benefits? What is the attitude toward regulation today? Does it appear that regulatory legislation should be tailor-made for a state, to suit its individual circumstances? If so, what circumstances call for what legal provisions? In other words, the purpose of this report is to furnish information useful to states that are interested in making decisions about forest practice laws.

The changing national attitudes toward the use and abuse of forest resources are traced as historical background for interpreting legislative actions taken in the states. For each of the states studied, the political forces involved with forests are examined to determine how they contributed to the development and current form of the forest practice act. A description of each law is provided. The law's major amendments and the reasons therefor are also included.

The purposes for which the act was passed are analyzed--i.e., what forest conditions or practices was the legislature trying to change? As with any regulatory program, there are costs and benefits to the public and the regulated group. Available information on costs and benefits is included to illustrate what a state might expect if it decides such a program is desirable. Criteria are developed for evaluating the success of a state's forest practices act. Finally a list of the apparently successful features of selected administrative and regulatory systems is included to illustrate what form a model forest practices act might take.

1.3. Procedure

What states' experience with forest practice legislation should be studied? The list of states that have at least some sort of regulatory laws is a long one, for interest has been shown in such laws since well back into the nineteenth century. Nevada passed an Act to Preserve Young Trees in 1903. This Act prohibited the cutting of sugar pine, white and yellow pines, fir, tamarack, spruce, and flat-leaved cedar less than one foot in diameter two feet above the ground; it also prohibited the sale of lumber made from such trees. Three states passed similar laws before 1940: Louisiana, 1922; Idaho, 1937; and New Mexico, 1939. From 1940 to 1950, 13 states passed forest practice legislation: California, 1945; Florida, 1943; Maryland, 1943; Massachusetts, 1943; Minnesota, 1943; Mississippi, 1944; Missouri, 1945; New Hampshire, 1949; New York, 1946; Oregon, 1941; Vermont, 1945; Virginia, 1950; and Washington, 1945. During the 1950s and 1960s no new state legislation was passed.

Then in the 1970s, three states that already had forest practice laws passed new ones: Oregon, 1971; California, 1973; and Washington, 1974. The new laws were oriented just as was the EPA model act: to forest practices that would hold down water pollution and at the same time be silviculturally and commercially acceptable. These three laws were conceived in what one may term the "modern" spirit.

It was therefore judged appropriate to encompass in the present study the forest practice regulation experience of Oregon, California, and Washington. Should other states be given special emphasis? The decision was to include Massachusetts and New York in the list. The reasoning was to include states that have laws intended to establish good forest practices through incentives and voluntary action.

The author visited each of the five states and Washington, D. C., in 1976 to study the questions listed in Section 1.2. He gathered the writings, published and informal, that are listed in this report and interviewed the following persons:

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1. H. V. Decker, Assistant Director, Division of Lands and Forests, Department of Environmental Conservation
2. C. Thomas Male, III, Senior Sanitation Engineer, Program Development and Economics Section, Office of Program Development, Planning and Research, Department of Environmental Conservation
3. Francis A. Demerre, member, State Forest Practice Board
4. William James Kidd, Executive Secretary, Northeastern Lumber Manufacturers Association
5. Richard Nason, Staff, Woodlands Management, Finch-Pruyn and Company
6. Pierre L. Lorrain, Regional Logging Superintendent, Northern Division, Woodlands Department, International Paper Company

7. Raymond L. Mahler, Director, Applied Forestry Research Institute, College of Environmental Science and Forestry, State University of New York

Massachusetts

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2. Bruce S. Gullion, Commissioner of Fish, Wildlife and Recreational Vehicles, Division of Forests and Parks, Department of Environmental Management
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4. Daniel P. McGillicuddy, Planner, State 208 Nonpoint Source Pollution Planning
5. Alexandra D. Dawson, Director of Services, Conservation Law Foundation of New England, Inc.
6. Richard Holmes, Planner, Berkshire County 208 Nonpoint Source Pollution Planning
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5. Edward Ehlers, Executive Director, Forest Landowners of California
6. Henry Vaux, Chairman, State Board of Forestry
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2. Glen S. Hawley, Supervisor, Division of Private Forestry, Department of Natural Resources
3. Wallace W. Carey, District Forester, Private Forestry, Industrial Forestry Association
4. Gene Deschamps, Fisheries Environmental Coordinator, Department of Fisheries
5. Rollie Geppert, Forest Scientist, Department of Ecology
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7. Royce O. Cornelius, Director of Forest Resource Relations,
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Studies, University of Washington
11. David G. Knibb, Public Member, State Forest Practices Board

2. HISTORICAL BACKGROUND

2.1. The Need for the Forest Reserves

The theme of conservationists during the 19th century was the beneficial influences that forests have on health and climate (Ise, 1920). Cooper and Hoboken in the Patent Office Report for 1860 attempted to list the trees of North America by province, relate species composition to climate, and examine the possibilities of tree cultivation. They stated that "forests and trees are among nature's great purifiers of air, and as such should be protected and cultivated in this country much more than at present" (1860:444). One of the most influential works of this time was Man and Nature by George P. Marsh (1864). His exhaustive discussion of the influences of forests reviewed most of the research and observations on the subject. From his work, Marsh reached the conclusion that forests definitely exert a favorable influence on the permanence and regularity of waterflow, reduce the number and severity of floods, and reduce erosion. Although he thought there was some question about the validity of the argument that the presence of forests increased rainfall, he was of the opinion that it did.

State legislation efforts toward conservation during the 19th century were small and such laws as were passed were frequently unenforced (Ise, 1920). Fourteen states attempted to encourage tree planting by the passage of Timber Culture Acts that paid a bounty or allowed a tax exemption for tree planting. The small net result led most of these states to repeal the acts later. The American Forestry Association, founded in 1876, helped to form several state forestry associations.

Through their work, eight states established at least temporary forestry boards or commissions to develop state forestry policy, and the states passed a number of laws for forest fire control.

In response to Franklin Hough's Report upon Forestry (1878), written for the U. S. Congress, The Nation (1879) printed an article decrying his lack of practical suggestions concerning the future wood supply. The article stated that the first duty of "economic forestry" was to prove that tree planting was profitable; once this was done, investment would flow into forestry naturally and insure a future wood supply. Since forests "play the most important part in retaining and distributing the rain and snow which falls," The Nation (1879: 87, 88) called for the federal government in the West to "set aside and scrupulously preserve at least such portions of forest-covered mountain ranges as give rise to important streams," especially on the west slope of the Sierra Nevadas, because of the deep snow and little rain; "to preserve California is the first and greatest duty of American forestry." For the East, they stated that "under existing circumstances large government reservations of wood lands in any of the older states are now impracticable." This article proved to be prophetic in its analysis of the need to prove the wisdom of reforestation and to establish forest reserves.

The passage of the Forest Reserve Act of 1891 gave the President the power to remove federal forest lands from public and private use. Since the federal government had major land holdings only in the West, it was there that the first reserves were created by Presidents

Harrison and Cleveland. Unfortunately, there were no provisions made for management or protection of the reserves.

2.2. The 1897 Organic Act

The first major attempt to correct the deficiency of the 1891 Act was the introduction of the McRae Bill in 1893 (Bassman, 1974). The Committee Report (House Report 119) stated that the "objectives. . . , although not defined by law, are represented to be protection of the forest growth against destruction by fire and ax, and the preservation of forest conditions upon which water conditions and water flow are said to be dependent." The bill would have allowed the Secretary of the Interior "to sell under certain restrictions the timber of commercial value. . . as may be shown to be of no benefit to the forest as a forest, and needed by the inhabitants--instead of giving it away, as done now" (Congressional Record, 1893:2372, 2374).

Opposition to the McRae Bill came from both anticonservationists and conservationists (Bassman, 1974). The mining, timber, and other interests saw the bill as an attempt to make them pay for wood they had been getting free. Conservationists saw it as an attempt to open the reserves to further plundering. Congressman Hermann, at first opposed to the bill, supported it once his amendment was passed that allowed the sale of only dead or mature timber that interfered with the preservation of the remainder. Even though he would have preferred that no cutting be permitted, he was convinced of its necessity to keep the reserves. The McRae Bill as amended passed the House in December, 1894, but because of western influences the Senate did not act on it. Indeed, the Senate paid little attention to forest reserve legislation

until 1897, when President Cleveland issued thirteen proclamations establishing reserves in seven states. He took this action upon the oral recommendations of Charles I. Sargent, Chairman of the National Forest Commission appointed in 1896. The Commission's report had not yet been made public. A storm of protests blew in from the West (Bassman, 1974).

Charles D. Walcott, of the U. S. Geological Survey, concerned over the future of the reserves because of the controversy in the Congress, persuaded Senator Pettigrew to introduce an amendment to the Sundry Civil Appropriations Bill (Forest Reserve Section) of 1897. Based on the McRae Bill, Senator Pettigrew's amendment added "large growth of trees" to the "dead and mature" language in the Secretary's authorization to sell timber. Proponents of the amendment in the Senate saw the management of timber through cutting and road building as an effective means of combatting forest fires. The amendment had three major objectives: (1) protection of forests from fire; (2) protection of forests for watershed purposes; and (3) protection of forests for timber purposes. A fourth objective, and the one which assured its passage, was the suspension and review for nine months of the thirteen reserves created by President Cleveland. President McKinley signed the bill on June 4, 1897. Senator Pettigrew's amendment is now known as the Organic Act of 1897 (Bassman, 1974).

During the next decade public interest and action on conservation issues increased, primarily as the result of the debate surrounding the passage of the Organic Act, and the efforts of Gifford Pinchot and President Theodore Roosevelt (Ise, 1920). The states began to

purchase and protect their own forest reserves. Many new private organizations concerned with forestry and conservation were formed. By 1912, conservation provisions were included in the party platforms of the Democrats, Republicans, Progressives, and Prohibitionists. The primary concerns were to prevent forest fires and to ensure reforestation to protect the future wood supply and control erosion. The question was who should do it and how.

2.3. The 1911 Weeks Law

An important contribution to approaching conservation problems was the Weeks Law of 1911. This law appropriated matching funds to states in support of forest fire patrols, established a precedent for federal-state cooperation in forestry matters, and provided funds for the purchase of lands as forest reserves around the headwaters of navigable streams in the East. It also allowed states to enter compacts for conserving forests and water supplies, in cooperation with private owners. Friends of the bill expounded on the need to maintain the hardwood timber supply and on the favorable influences of forests on maintaining water flow, decreasing flood damages and reducing the dangers to navigation caused by sedimentation resulting from the erosion of deforested lands (Congressional Record, 1911). The attention paid to the effects of forest on navigable streams was the result of a report by the House Committee on the Judiciary in 1908 which stated that the federal government had "no power to purchase lands within a state solely for forest reserves; but under its constitutional power over navigation . . . (it) may appropriate for the purchase of lands and forest reserves . . . (provided the) lands have a direct and

substantial connection with the conservation and improvement of the navigability of a river actually navigable in whole or in part" (Congressional Record, 1911:2596). Primary support for the navigable-rivers argument came from the U. S. Geological Survey and its research conducted by Leonidas Chalmers Glenn, who concluded that "there is abundant evidence on rivers such as the Tennessee of increased silting in the navigable portions of streams because of the increased erosion resulting from deforestation" (Congressional Record, 1911:2597).

Those opposed to the Weeks Bill felt that it was primarily a "pork barrel" operation and would eventually cost far more than the eleven million dollars to be appropriated. Representative Scott cited Corps of Engineers studies by Colonel Russell on the Ohio River, Major Hart on the Cumberland and the Tennessee, and Colonel Burr on the Merrimac, and concluded with "Colonel Bixly stated in his opinion at least 95 percent of the increased height and suddenness of the flood [of the Connecticut River] was due to improved drainage of the country. . . (and it is) not the washing from the headwater of the stream that contributes to these difficulties; it is the caving of the banks along navigable reaches of the stream" (Congressional Record 1910:8985). By down-playing the connection between forests and stream flow, opponents hoped that they would weaken the bill's support. However, East and West combined to force its passage.

American Forests, particularly in 1910, gave considerable space to articles concerning the problems of forest conservation and lent its editorial support to the Weeks Law. In examining the problems, Hartner, Cary, and Hollis (1910) saw forest fire and lack of

reforestation as being of primary importance. As solutions, they suggested increased fire control, especially for cut-over lands to protect regeneration. Tax changes in the form of a nominal valuation for the ad valorem property tax, or an exemption for a stated period with a yield tax upon the harvest, were viewed as necessary to encourage owners to hold their land for the next crop. Increased federal and state ownership was also suggested. Cooperation and education were viewed as preferable to federal or state regulation. These same solutions were arrived at by the state of Washington Commission on Forest Legislation. One further note was an abstract of a Maine Supreme Court dictum, in response to an inquiry from the legislature, that the state could regulate forest practices to prevent erosion and sedimentation under the state's police power to protect the general welfare. The Court said such regulation would not be an unconstitutional taking of private property.

2.4. The 1924 Clarke-McNary Act

Timber Depletion, Lumber Prices, Lumber Exports, and Concentration of Timber Ownership, or the Capper Report (1920), prepared for the Congress by the Forest Service under Colonel W. B. Greely, presented a grim picture of the future timber supply. Regional timber depletion was cited as a cause of high prices because of increased freight charges and decreased local competition. Depletion was not charged to use of the resource, but rather to destructive cutting practices and to forest fires that prevented tree regeneration from restocking the land.

Recommendations in the Capper Report concerned the need for federal and state legislation to remedy the problems. By expansion of the Weeks Law, the Forest Service could further assist the states in increasing the level of fire control and in developing nondestructive cutting practices and practical methods of reforestation. The Forest Service could also help the states to study and revise their ad valorem property-tax systems to ease the financial pressures against holding cutover lands until the next crop of trees was ready to harvest. Federal matching funds could be provided to states that required operators to comply with reasonable forest practice standards. Funding for expansion and consolidation of the National Forests was recommended to bring federal forest land ownership to 50 percent of the total. The states should develop forest fire control programs for all forest lands, timbered and cut over. An agency should be established to administer whatever laws should prove necessary to prevent fires and ensure reforestation. The membership of the agencies would include representatives of the landowners, industry, the general public, and others interested in timber production.

The report of the Society of American Foresters Committee for the Application of Forestry presented the same picture of depletion and devastation as did the Capper Report, but included in its recommendations federal regulation to control these ills. This recommendation touched off a debate that is still with us today. One side of the debate favored education, demonstration, subsidy and tax reform to prevent devastation. The other side advocated compulsory regulation (Graves, 1920). Among those in favor of regulation, some

supported state or local regulation to correct the forest problem, others favored federal regulation. Hall (1920) saw the prospect of federal regulation as attempting to impose a national solution to a state and local problem. Pinchot (1920:442) was in favor of federal forest ownership and federal regulation. He stated that the "great majority of foresters now appear to be reaching the conclusion that compulsory legislation is the only way to prevent devastation."

Two bills dealing with the debated issues were introduced into Congress in 1921. The first, sponsored by Representative Snell, would have expanded federal ownership and federal cooperation with the states. Support for the bill came from Colonel Greely, state forestry officials, Harris Reynolds (1921), and the editorial pages of American Forestry. Senator Capper introduced a bill that would have expanded federal ownership and would have established a federal regulatory program. The National Conservation Association, Gifford Pinchot, and Frederick Olmstead (1921) supported Capper's bill. In a Society of American Foresters referendum, members split 195 for states' rights and interests versus 109 for federal control (1921:223). Neither bill passed, but national policy has since followed Snell's position (Winters, 1950).

Out of the debate came the Clarke-McNary Act of 1924 that broadened federal aid for fire control, provided funds to state nurseries for production and distribution of seedlings for farm woodlots, and supported shelterbelt and windbreak planting. A Society of American Foresters referendum on the bill while debate was in progress (1924:341) showed overwhelming support for it: 343 to 37. American Forests and Forest Life provided editorial support, but felt the bill did not go far enough (1924).

2.5. Late 1920s to 1941

2.5.1. Controversy of the Late 1920s

Industrial foresters, still a small minority, did not see the need for regulation by any level of government. Their first priority was getting better fire control, especially for logged-over lands, to justify planning forestry operations with more attention to ensuring regeneration. Tax revisions and stable markets would permit them to operate on a sustained-yield basis. The position taken was that "landowners cannot be compelled to follow good forest practices, neither can the public be compelled to accord such owners fair treatment in matters of taxation, fire protection, and things of this kind" (Chapman, 1928:185). Thus, the problems of devastation and departure from sustained yield were viewed as financial: "You can't talk very convincingly of perpetuation of a regional industry when perhaps 60 percent of it is losing money. . .Forestry will be practiced when it pays" (Ames, 1928:185, 186).

Deforested America, by Major Ahern (1929), again brought forest problems to the attention of Congress. In the foreword, Gifford Pinchot stated that the Major's success as a forester in the Philippines was ". . .built on government control of lumbering. That is and has always been the foundation of such success throughout the world. And throughout the world the right of the government to exercise such control. . .is recognized. . .Without it, forest devastation cannot be stopped in the United States" (1929:vi). The problem of the future timber supply had not changed significantly since the Capper Report in 1920. The end of the private virgin stands was in sight. Because

public holdings were not expected to supply more than 6 percent of timber requirements in 10 years, their greatest value for some time to come would be as demonstration forests. As the private virgin timber disappeared, second growth would have to be substituted, but reproduction was menaced by destructive logging practices and by widespread and ever-increasing forest fires. "Totally devastated areas are increasing, accompanied by erosion and water-flow problems" (1929:37). Major Ahern saw "little hope that even one-half of our minimum lumber requirements can be expected from second growth if cutting is confined to an amount not exceeding the annual growth" (1929:37). The report concluded that the chief troubles were destructive logging practices (especially the new high-speed, high-lead systems), unregulated slash disposal, and lack of adequate fire control, especially for second growth. Federal regulation was viewed as the answer, since "forest conservation has never succeeded until the strong arm of the government was used" (1929:41).

2.5.2. Federal Action

In 1933, Congress passed the National Industrial Recovery Act, which mandated the formation of a "Code of Fair Competition for the Lumber and Timber Products Industries." Article X of the Code, "Conservation and Sustained Production of Forest Resources," required industry to leave cutover lands in good condition for reforestation (Winters, 1950). Although there were problems--formulation of rules, obtaining compliance, and getting future funding (Watzek, 1934; Goodman, 1934; Russell, 1934; Woods, 1934)--a number of lumber associations took steps to comply, mostly in the West and South,

resulting in the introduction of more successful reforestation practices in the organized lumber industry (Winter, 1950). Recknagel (1934:996) saw the goal of Article X as "improved forest management through self-government of timberland owners. The alternative is autocratic regulatory control imposed on the owners by federal and state authority." However, the Code's effects were short-lived: The Supreme Court in 1935 declared the N.I.R.A. unconstitutional.

2.5.3. Problems of Industrial Forestry

During this period, the problems of industrial forest practices were examined. In discussing the regional situations Chapman (1938) in the Northwest, Colby (1938) in the Northeast, and McGowin (1938) in the South all stated the need for increased forest protection from fires, insects, and diseases. Other problems in the Northwest were property-tax reform for standing timber to ease liquidation pressures, unstable ownership, competition from public timber, and maintaining wood markets. In the Northeast, the concerns were to get closer utilization, to persuade loggers to take greater care of growing stock, and to increase mechanization. Tax reform was seen as necessary to good forest practices in the South. To solve these problems, it was thought that an informed public would support the needed tax reforms and that the government-industry cooperative approach would advance the majority of operators' forest practices to acceptable standards (Hall, 1939). Gillett (1939:103) stated that it was his "firm belief that if given a few years fair trial under some such arrangement as the Clarke-McNary Act, the need for regulation of all forest operations would disappear,

and the minority of operations could then be reached by regulation with the support of the majority."

2.6. 1941 to 1954

2.6.1. Joint Committee on Forestry

In 1938, President Roosevelt requested the Congress to establish a joint committee to examine the forest problem, stating that the problem was "essentially one of land use" (U. S. Congress, Joint Committee on Forestry, 1941:1). Because of the onset of World War II, Congress twice extended the committee's deadline for completing a report. In 1941, the Joint Committee on Forestry issued Forest Lands of the United States (House Report 323). Their assessment of the situation was that "For what has happened to our forest land, timber owners are responsible because of their improvident treatment of the forest, the public, for its indifference, and the government for allowing it to continue" (1941:5). Destructive forest exploitation and unfavorable economic conditions in many forest regions had accentuated unemployment; decreased income, purchasing power, and living standards; and created idle land and ghost towns. Extremely complex and interlocking patterns of public and private ownership were charged with seriously obstructing forestry development, especially in the Pacific Northwest. The major problems were seen to occur on the nonfarm private holdings, 86 percent of which were not well managed and, at best partially stocked. This characterization applied to 70 percent of the farm forests.

Converting private holdings to sustained-yield management faced several obstructions. Fire, insects, and disease continued to

threaten large areas. Competition from substitutes and imports plagued markets that were unstable under the best of conditions. Tangled ownership patterns made efficient management almost impossible. The industry, already suffering from excess capacity, was under considerable pressure to liquidate so as to escape high property taxes and bonded indebtedness. Finally, there was the difficulty, delay, and cost of rehabilitating and managing already deteriorated lands.

The Joint Committee spelled our private and public obligations. Owners should use their forest as a permanent resource rather than liquidating it. Keeping lands reasonably productive and providing adequate restocking would not hurt the lands' commercial value and would provide a reasonable profit. It would have a favorable influence on watershed protection, erosion control, wildlife, forage, and thus serve the public interest. "The public has watched and sanctioned exploitation and destruction of private forests proceed to the point where these processes can be promptly and effectively reversed only with public assistance" (1941:27). State governments ought to ease the tax burden of holding cutover land, perhaps by a deferred-yield tax. Forest recreationists were advised to take greater care with fire. Where the private forest owner could not or would not provide proper management, public acquisition was to be the alternative of last resort.

The Committee made recommendations in six areas. First, the Clarke-McNary Act should receive increased funding for fire control, and should be extended to insect and disease control and to

reforestation. Second, the extension program established under the Cooperative Farm Forest Act of 1937 should be enlarged and funding increased. Third, provisions for public-private sustained-yield units needed to be made. Fourth, sound programs for private forest consolidation and management should be supported by a program of long-term, low-interest loans. Fifth, forest product and management research should be expanded. Finally, national forest expansion and consolidation should be undertaken when possible and where the need was greatest.

2.6.2. Reaction to the Committee's Report

The program developed by the Forest Service and the Secretary of Agriculture followed the recommendations of the Committee, except that the program included a plan for public regulation of forest practices on private lands (Hopkins, 1941). National, state, and local advisory boards would be established. The local boards would be responsible for initiating regulations, subject to the approval of the state board. The state would administer and enforce the regulations unless it requested the federal government to take over, or unless the state's regulations were not satisfactory to the Secretary of Agriculture. The regulations would provide for (1) restocking of cutovers; (2) clearcut-area limitations, unless extensive clearcutting was an approved practice; (3) reservation of thrifty trees to keep the land productive; (4) prevention of unnecessary damage to young growth and residual trees; and (5) ensure effective fire control, by slash removal if necessary. Adequate forest protection was the key to the regulatory program.

Smith (1941) saw regulation as a complete change in federal policy that for 40 years had stressed cooperation with the states to solve mutual problems. However, the Forest Service had not acted on this policy except where it was incidental to the acquisition program. Now, said Smith, it was seeking centralized government regulation as a solution to the problems its own indifference had created. Only when cooperation had failed should the police power of the government be used, but cooperation had not really been tried. In conclusion, Smith (1941:103) stated that the adoption of regulation would relieve industry of all responsibility and "the gun and the sword must replace the school book and the rewards of private initiative."

Gifford Pinchot (1941:209, 210) did not agree with Smith. "Nowhere in the world has permanent safety for forest lands been secured except by two things," Pinchot said. "The first of them, and the best of them, is government ownership. The second is government control." His justification of federal control was that the federal government could afford to take the long view. State governments were too political and vacillating to provide proper protection, and lumbermen were strongest where controls were needed the most. But Pinchot's drive for federal regulation failed; it lacked the support of the forestry profession.

2.6.3. The Issues

This debate would not be quieted until the leadership of the Forest Service changed in late 1954. The issues were the same as in previous periods: cooperation, education, and incentive versus federal regulation versus state regulation.

2.6.3.1. Voluntary action. Dana (1943) saw the time approaching when owners would no longer have a choice between unrestricted exploitation and intelligent management, the question being whether the latter would be voluntary, or enforced by some level of government. Education and voluntary action were better in the long run, because rules could not take the place of a management plan developed by a trained forester (Dana, 1945). What was needed was increased education of the public and small-tract owners by more state extension foresters, and increased cooperation among public agencies, forest-products industries and landowners (Roberts, 1945). Because the forest industries were "becoming agricultural industries, anchored to the land which produces their needed crops of trees," Gillett (1946:725) believed that any "successful tree-growing program must be based on the solid foundation of sound economics." The problem of the economics of growing trees was not fully solved until after the great depression of 1932, when purchase price of the needed trees rose above the cost of growing them (Weyerhaeuser, 1949).

2.6.3.2. State regulation. Those in favor of state regulation did not think the situation was as serious as the Forest Service maintained. With extended education, inducement, and cooperation under locally applied state regulations, forest owners could continue to improve their management (Compton, 1943). Since the greatest aggregate damage to forest lands occurred on the farm woodlots and other small properties, and was the hardest to control, regulation could succeed only if those individuals could be convinced of the need for and reasonableness of the program. Chapman (1945) believed that state

regulations would elicit more sincere support than federal regulation; therefore it would have a greater chance of success. The regulatory program would establish a state forestry board, and where necessary regional advisory boards, to develop, administer, and enforce rules to prevent destructive cutting and cutting of immature stands, and to ensure prompt regeneration. Issuance of a cutting permit would be contingent upon compliance with the rules or an alternative management plan (Wilson, 1945). Federal activity would be kept on a cooperative basis. Progress would be slow, since the focus of the regulation would be education and self-motivation rather than compulsion (Recknagel, 1946). The enthusiasm for state regulation came primarily from the fear that if the states did not regulate practices, the federal government would (Dana, 1943; Shirley, 1948).

2.6.3.3. Federal regulation. Federal regulation was seen by the Forest Service as only one part of needed national forest policies. The regulations would be nationwide and administered under strong federal leadership to stop destructive cutting and ensure a uniform policy (Watts, 1943; 1950). The states and timber operators that failed to develop and enforce the necessary regulations would have an unfair competitive advantage over those that succeeded with regulation. Considering that two-thirds of the cutting on private lands was poor or destructive (Clapp, 1949), the national interest in a continuous wood supply outweighed the issue of states' rights (Crafts, 1952). In assessing the situation, Clapp (1949:530) stated that "if the people of the United States really want the forest conservation job done, they will have to turn to the federal government for one of the most important and difficult phases of it, that of public regulation."

2.7. 1955 to the Mid 1960s

From the mid 1950s until the mid 1960s there was little controversy over the issue of federal versus state regulation of forest practices. The Forest Service dropped its support for federal regulation and turned to other solutions (McArdle, 1955).

Timber Resources for America's Future, published in final form in 1958, contained no exhortations for regulation of any form to solve the problems it revealed. Farmers and small-scale nonindustrial owners still had the poorest forest conditions and were in need of the greatest improvement if they were to provide their share of the wood supply. Improvement was seen as imperative, because those holdings made up 61 percent of the commercial forest lands. The reasons for the poor management were (1) lack of knowledge of opportunities and procedures of good forest management; this seemed to be the most significant factor; (2) lack of interest; (3) immediate income needs; and (4) lack of markets. Because of improved economic and financial conditions, the forest industry was expected rapidly to expand its ownership assistance programs. Also, industry was in the best position to help small owners through demonstration, education, and assistance, and to influence the cutting practices of independent loggers.

Although no timber famine was seen for the short run, future demand for forest products would require increasing effort and investment from all owners, public and private, to ensure an adequate supply.

Although private industry was still suspicious of the Forest Service position on public regulation, it thought that the traditional three-way cooperation could solve the problems if given a chance

(Drake, 1955). Voluntary action and a free economy were seen as the best alternative to the "regimented governmental philosophy of the soviet dictatorship" (Mosebrook, 1961:866). Sisam (1961:870) saw that "if there is a keynote to be struck for the future, . . . , it should be a double note compounded of the two elements of education and cooperation: education to provide increasingly a background of knowledge and understanding that will be needed to deal with the problems of the future, and cooperation to furnish the framework for more effective action."

2.8. The Environmental Movement

Beginning in the mid 1960s, Americans have become increasingly concerned over what has been termed the "environmental crisis." The causes of this increased public attention and concern are numerous, but McEvoy (1972) sees three as being the most important. First, media coverage of environmental problems has become relatively greater since 1966. Second, following World War II, people in increasing numbers have turned to the public parks and national forests for their leisure activities; with this has come increased personal exposure to the natural environment. Third, to many people there has been a definite deterioration in the quality of the rural, and even more the urban, environment. Those most concerned tend to be in the higher socioeconomic classes. They are also, relatively, the most powerful political and economic segment of the population. The environmental movement that has developed is different from the preservation and conservation movements of the past (Morrison, et al., 1972). Its members are concerned with all aspects of the national environment

and its "health," and with demand for resources and not just the supply. The violation of "ecological imperatives" by man in his relationship with the environment is seen to threaten both the quality of life and man's long-run survival. Ecological balance has been a central theme of the movement, but with no firm explanation of what it is, or how it is to be achieved. The focus has been on increasing awareness, solving specific current and anticipated problems, and more generally on preserving and restoring the quality of the air, water, and land by modification of life styles and by population control (Morrison, et al., 1972). However, McEvoy has found that "there is little indication . . . that the American public is seriously entertaining changes in its expansionist, growth-oriented value system" (1972:220), nor are they anxious to make any substantial sacrifices through increased taxes to ensure improvement of the environment.

Forestry has been one of the targets of raised voices in the environmental movement. This situation has developed to the point where "much of the public does not consider foresters to be suitable stewards of the land they manage" (Connaughton, 1966:448). On public lands, foresters have been accused of ignoring multiple-use considerations and emphasizing timber production through massive clearcutting and reliance on even-aged management. Concerns about private forest management center around the impacts of clearcutting on the environment and the ecological dangers of monoculture (Evans, 1972). To deny past mistakes is not possible, because these mistakes have "become visual symbols which raise valid questions as to the capability of those who would act as stewards of the forest environment" (Twiss, 1969:19).

These questions have come "primarily from the increasing need or desire for scenic beauty, recreation, clean water, and abundant fish and wildlife" (Newport, 1972:7). However, as Dean Wambach (1972:75) has stated, the choice of a quality of life and a product mix from our forests "is basically a social choice, not an economic choice. It is a matter of social goals and human desires, not corporate greed or economic irresponsibility." The cost of social choice will ultimately be borne by the public as consumers and taxpayers. To make a rational choice, they must know the benefits and costs of their alternatives.

2.9. Wood Supply and the Environment

The Outlook for Timber in the United States (1973) brought the issue of wood supply versus environmental concerns into focus. To avoid a substantial rise in the future prices of wood and wood products, steps would have to be taken to improve the productivity of all forest lands and to tighten up wood utilization. On public lands, conflicts had already developed over emphasizing timber management versus management for other products and wilderness. Private lands faced the increasing prospect that timber management and harvesting activities would be regulated to ensure consideration of environmental concerns. Industry felt that serious attempts must be made to solve conflicts over forest land use and to educate the public on "the potential for increased timber growth and the compatibility of timber production with other forest uses" (Muench, 1973:570). To the conservationist, the report brought out the need to improve forest practices on all lands, especially the farm woodlots and other small private holdings.

The incentives approach was favored by most industry spokesmen and by some conservationists (Pardo, 1973). Environmentalists supported a regulatory approach that would enforce what they saw as the duty of good stewardship toward the land, based on sustained-yield principles (Robinson, 1974).

2.10. The Federal Water Pollution Control Act and Forestry

2.10.1. Silviculture as Nonpoint Source Pollution.

The Federal Water Pollution Control Act of 1972, P.L. 92-500 (FWPCA), was a direct outgrowth of the environmental movement and the concerns of the general public. Water pollution is divided into two categories: point-source and nonpoint-source pollution. A point source is described in the Act as a "discernable, confined and discrete conveyance," such as "any pipe, ditch, channel, tunnel, . . . from which pollutants are or may be discharged." Control of point sources is based on "end of pipe" effluent limitations enforced through National Pollutant Discharge Elimination System (NPDES) permits. Nonpoint-source pollution is not so clearly defined, but in general it is any pollution entering the water that originates from a nonconfined area. Nonpoint-source pollution is associated with such land uses as agriculture, silviculture, mining, construction, and small animal feedlots. This type of pollution is most successfully controlled by land-use planning and management techniques.

Under the Federal Water Pollution Control Act, the Environmental Protection Agency (EPA) exempted silvicultural activities that cause point source pollution from the National Pollutant Discharge Elimination System permits program, but did not exclude these point

sources from effluent limitations and other standards developed under the FWPCA (Federal Register, 1976). The Natural Resources Defense Council challenged this exemption in court and won. The court ordered EPA to extend the NPDES permit program to point-source pollution caused by silvicultural activities and to establish the necessary regulations (NRDC vs. Train). In compliance with this order, EPA determined that most silvicultural activities are nonpoint-source in nature--i.e., "is initiated or caused solely by natural processes, including precipitation, drainage, seepage, percolation, and runoff; and is not traceable to any discrete or identifiable facility" (Federal Register, 1976:6282). Activities classified as point source, which would require permits, are "rock crushing, gravel washing, log sorting and log storage facilities" (Federal Register, 1976:6282).

2.10.2. Roles of Government.

Each level of government--federal, state, and local--has a role, established under the FWPCA, in the control of nonpoint-source pollution (Grefrath, 1974). The federal government is responsible for national planning (Section 102) and coordination of state programs (Section 305). Where nonpoint-source pollution is a significant problem, EPA is to develop (Section 104, 105) and distribute (Section 304 [e]) information on methods of controlling it. The burden of planning and enforcing nonpoint-source controls rests with the states. Their mission is to be accomplished through river basin planning (Section 303), which is to address both point and nonpoint source pollution. The local governments' responsibility is to develop "Areawide Waste Treatment Management Plans" (Section 208) for areas in which both point- and nonpoint-source pollution is a problem.

The governor of a state can require nonpoint sources to be part of the state program thereby relieving the local government of this responsibility. In either case, nonpoint sources must be identified, and such procedures and methods developed as are usable for controlling their pollution.

2.10.3. Role of EPA.

In fulfilling its obligations under the FWPCA, the EPA issued the first draft of a Model State Forest Practices Act in November, 1974, for eventual submission to the Council of State Governments. The draft, modeled after a forest practices act passed in California in 1973, was distributed to interested parties for comment. The resulting criticism was extensive. The administrative and regulatory requirements were called complex. Critics pointed out that the Model Act failed to provide for the exclusion of forest practices that were in conformity with the Act from court action brought under other water laws. The Model Act would require protection of forest values and uses that might not be included among the landowner's interests--for example, recreation or aesthetic values. The result would be an uncompensated reduction in the owner's income. Also included in the Model Act was a requirement for a Timber Harvesting Plan. Debate over the advantages and disadvantages of such a plan centered around the effectiveness of the plan in assuring (1) protection of unique areas and endangered species and (2) faster and more complete compliance with the objectives of the Act.

A second draft of the Model Act was issued on March 13, 1975, in response to the comments received. Although the complexity of the

administrative and regulatory procedures had been reduced, the second was substantially the same as the first. As a consequence there was little change in the response. EPA then decided not to submit a Model Forest Practices Act to the Council of State Governments at that time.

2.10.4. AFA Workshops.

As a result of the controversy over the Model Act drafts, the EPA contracted with the American Forestry Association to hold a series of seven regional workshops across the country to search out the best means of assuring timber production in conformity with environmental requirements. To clarify its position to participants, EPA expressed approval of the "Best Management Practices" (BMP) approach. This term refers to practices that are "determined by a state, after examination of alternative practices, to be practicable and most effective in preventing or reducing the amount of pollution generated by nonpoint source(s) to a level compatible with water-quality goals" (Smith, 1975:4).

During the EPA-AFA workshops, only minimal support was expressed for federal regulation. Federal, state, and private forestry interests expressed the opinion that the states could handle the problem. In general, it was felt that regulation should be sought only after careful study to define the problem, and then only to the extent necessary to be effective. There was also expressed concern over the need for EPA to state clearly that compliance with forest-management requirements would constitute compliance with other water laws. Finally, the need was voiced for examining alternatives, such as the

Soil Erosion and Sediment Control Act developed by the Council of State Governments (1973), or forest land tax reform which could be used effectively in some states to get Best Management Practices instituted (Pardo, 1976).

3. HISTORICAL BACKGROUND, DESCRIPTION AND
INTENT OF THE LAWS

3.1. New York: Hammond-Demo Forest Practice Act, 1946
(Section 60-d New York Conservation Law)

3.1.1. Historical Background: 1945 Forest Practice Act

Support for the Forest Practice act was widespread among the members of New York's forestry profession. The New York Section of the Society of American Foresters endorsed the state legislature's efforts to pass the Act. The Section's members individually played a prominent role in helping to draft the bill (Howard, 1947). Because compliance was voluntary, forest industry and private landowners generally supported the bill's passage. So uncontroversial was the bill that no significant opposition ever surfaced.

3.1.2. Description of the 1945 Law

Under the Act the commissioner of the State Conservation Department (now the Department of Environmental Conservation) was to establish no more than 20 forest districts of one or more counties; 15 were established. District forest practice boards were set up to develop forest practice standards to be approved by the State Forest Practice Board and the conservation commissioner. Once approved, the district board had to adopt the standards formally and promote their application. Three persons from each county in the district are appointed by the chairman of the county board of supervisors and are approved by this board. One must be a member of the board of supervisors, and at least two must be individual woodland owners or representatives of

industrial woodland owners. Ex officio members are the chairman of the fish and wildlife district board encompassing the forest district and the chairmen of the soil conservation districts within the forest district. A professional forester serves as district director, as a consultant to the board and, with the aid of assistant foresters, provides technical services to the district's forest landowners.

A state forest practice board was established to coordinate and approve the activities of the district boards and to advise the conservation commissioner on forest practice standards. Based on recommendations from the district boards, the state board set up uniform forest practice standards for four forest types: (1) northern hardwood, (2) oak, (3) spruce-fir, and (4) pine. Each district board elects one of its members to the state board. The deans of the state colleges of forestry and of agriculture and the chairmen of the state conference board of farm organizations, the state fish and wildlife management board, and the state soil conservation committee are ex officio members.

To qualify for technical assistance -- e.g., plantation establishment and care, timber marking, marketing, silvicultural treatment of immature stands -- a woodland owner must become a cooperating owner. This he does by agreeing to comply with the district's approved forest practice standards for a specified period of time and to follow a woodland management plan prepared by the district director, or his own plan if approved by the district board. Compliance is completely voluntary, but failure to comply ends any obligation of the state to provide further technical services.

3.1.3. Intent of the 1945 Law

The passage of New York's Act was the result of the extended national controversy that occurred during the 1940s. The threat of federal regulation was ever in the minds of the legislature, the profession, and the industry. Rather than attempting to police the woods through a regulatory program it was decided that more could be accomplished by a service program to forest landowners.

The expressed purpose of the Act is to encourage good forest management practices so as to prevent damage to forest productivity. The Act states that this was necessary to provide a sufficient supply of raw materials and to stabilize the wood-using industries upon which many communities depended (New York Forest Practice Act, 1945). Grazing, repeated clearcutting, and high-grading were the major threats to forest productivity and dependent communities (New York Division of Lands and Forests, 1948). The Act established as state policy that the program was to encourage practices that would also promote secondary benefits: soil and watershed protection and wildlife habitat improvement (Davis et al., 1956). In 1968, a new set of forest practice standards was approved by the conservation commissioner, adding outdoor recreation and beauty to the list of secondary benefits.

3.2. Massachusetts: Forest Cutting Practices Act

(Chapter 539 General Laws, Acts of 1943)

3.2.1. Historical Background: 1943 Forest Cutting Practices Act

In the late 1930s, conservationists in Massachusetts became concerned about the increasing areas of cutover and depleted forest land.

Under the leadership of the Massachusetts Forest and Parks Association, they persuaded the state legislature to investigate (Lambert, 1944). The result was Chapter 544 (1941), which created a State Advisory Forest Committee composed of the director of the Division of Forestry in the State Department of Conservation (chairman), the director of Extension, and the commissioner of the Agriculture Department. The state committee was directed to set up regional committees of forest landowners to study the needs and characteristics of the forests. Based on the regional committees' reports, the State Advisory Forest Committee presented its recommendations and a draft Forest Cutting Practices Act to the state's House of Representatives early in 1943.

Objectives to the Act came from "the lumber industry and some woodland owners who felt that any timber cutting was a private right to do with as one pleased" (Massachusetts State Forest Committee, 1954:1). To calm the antagonism of the loggers and to enlist their cooperation, some compromise was needed. The draft Act would have imposed a fine on the logger for failing to follow the cutting plan that the Division of Forestry was required to assist in drawing up for each operation. This section was amended to impose a fine for failing to notify the director of the Division of Forestry of the forest owner's or operator's intent to cut (Lambert, 1944). The state legislature then acted rapidly on the draft and passed it as the Cutting Practices Act in June 1943.

3.2.2. Description of the 1943 Law

The law established a State Forestry Committee appointed by the governor. It is composed of four members representing (1) farm woodlot owners, (2) industrial woodland owners, (3) other woodland owners, and (4) the general public. The director of the Division of Forestry is an ex officio member.

The Committee had to prepare a tentative list of cutting practices. By law, the practices had to include provisions for leaving seed trees to secure adequate restocking, except for cases when clear-cutting had been approved by the director. At least four public hearings had to be held to inform the public and solicit comments before the Committee could adopt a list. The commissioner of conservation then had to approve and promulgate the practices. Better to fit local conditions, the Committee could divide the state into no more than four regions and establish practices separately for each.

Under the law, the landowner or the logger was required to provide written notice 30 days before beginning a timber-cutting operation. The director could waive the requirement in emergencies -- e.g., clean-up after a hurricane. Exemption was provided for (1) cutting for personal use by the landowner or tenant, (2) clearing land for building or agriculture, (3) cutting less than 40,000 board feet and 100 cords a year for sale, (4) maintenance cutting in pastures, (5) clearing and maintaining public utility rights-of-way. Failure to give notice of a nonexempt cutting was punishable by fine: a maximum of \$25.00. After receiving notification, the Division must send a forester to

examine the site. He advises and assists the owner or operator in preparing a plan that conforms with the state's cutting-practice requirements, and he provides a copy for the owner or operator. The Division may receive help from Massachusetts State College (now the University of Massachusetts) and Forest Service personnel in preparing cutting plans. If necessary to ensure proper reseeding, the forester may mark the required seed trees for the owner or operator. An inspection must be made during operations and after completion to determine if the logger is conforming to the cutting plan, and a report sent to the Committee.

The law was amended in 1952 (Chapter 427). Sole responsibility for notification and securing a plan was placed on the landowner. The logger is now required to operate in conformance with the cutting plan, nor can he begin operations without a plan. Violation of either requirement carried a maximum fine of \$25.00. Also the exemption for the maximum allowable cut for sale without notification was lowered from 40,000 board feet and 100 cords per year to 25,000 board feet and 50 cords.

Other amendments were passed in 1957 (Chapter 652) and in 1970 (Chapter 756). The first required all persons and companies engaged in timber harvesting for hire or profit to obtain a license from the state. The license can be revoked by the Director for failure to provide notification or for not following the cutting plan. There is a maximum fine of \$25.00 for operating without a license. The second amendment made the fine for failing to give notice and for not following the plan a maximum of \$25.00 per acre cut.

3.2.3. Intent of the 1943 Law

As in New York, the national controversy over cutting practices has alarmed Massachusetts conservationists. States' rights were an important issue in Massachusetts, and the threat of federal regulation led the legislature to pass its own law. Requiring the forest owner to seek advice from the state was considered less of an infringement on individual liberties and more likely to enlist cooperation than a strict regulatory program (Barraclough et al., 1940).

To protect the public welfare, the legislature was attempting to rehabilitate and protect forest lands. The reasoning was that the general public has an interest in "conserving water, preventing floods and soil erosion, improving the conditions for wildlife and recreation, and providing a continuing and increasing supply of forest products for farm use and for the wood-using industries" (Chapter 539, 1943). The Act states the policy that all timberlands be kept in a condition consistent with the public interest, and notably that these lands be restocked with desirable tree species within a reasonable time after the harvest. To this end, the state's police powers are called into play. The only concession is to the financial necessities of landowners and loggers--a concession built into the list of forest practices approved and promulgated by the conservation commissioner. This was necessary to avoid the constitutional question of the state's regulations resulting in a taking of private property for public use or benefit without payment of just compensation to the owner.

3.3. California: Forest Practice Act, 1945 (Chapter 85)
and Z'berg-Nedely Forest Practice Act, 1973
(Division 4, Chapter 8, Public Resources Code)

3.3.1. Historical Background: 1945 Forest Practice Act

California's first state Forestry Commission was established by the legislature in 1885 to promote "the preservation and planting of forests, and the consequent maintenance of the water resource" (California Statute 10, Chapter 11, Section 4, 1885). The Commission was dissolved in 1893 because of its lack of accomplishments. Two other commissions were created, in 1905 (Statute 235, Chapter 264, Section 1) and in 1927 (Statute 238, Chapter 128, Section 373 c), with the same result (Lundmark, 1975).

With the advent of World War II in 1939, the demand for lumber began to rise. California experienced a rapid influx of loggers from other states, mostly the Pacific Northwest, to take advantage of the abundance of merchantable timber. Mills that had closed during the Depression began to reopen, and new ones sprang up. Contract logging, previously almost unknown in California, became a common practice. Most of the new loggers had no interest beyond cutting the timber and getting out, leaving in their wake badly damaged land (Fritz, 1962).

2.2.1.1. Forestry Study Committee. Public concern over the spreading forest devastation led the legislature in 1943 to create a Forestry Study Committee (Statute 1067, Chapter 172), charged with studying the feasibility of restoring the state's cutover lands to productivity. The Committee was to inspect cutover areas, hold hearings, and report back to the legislature (Lundmark, 1976).

In the same act that created the Study Committee, the legislature established an 18-inch minimum diameter cutting limit for conifers in northern California.

Early in 1945, the Study Committee completed its report, "The Forest Situation in California" (California Legislature, 1945). Its findings indicated that the state faced the prospect of a serious wood shortage within a generation unless cutover lands were reforested. Old-growth liquidation, speeded up by war demands, would be complete within 40 to 50 years. Much of the young growth of merchantable size was being cut to feed the war effort. Fire and insects were taking a large toll every year.

The Committee advanced several recommendations to help solve forestry problems. The first and most important was passage of a state law under which minimum standards for logging operations would be established; this would forestall the threat of federal intervention. These standards were to be aimed at slowing the liquidation of old growth, protecting immature young growth, and ensuring that cutover lands were left in productive condition. Although the Committee stated that to achieve practicality and a high degree of self-regulation, timber owners and loggers would have to be consulted, it recommended that the State Board of Forestry should approve the final standards. The Committee hoped that if forest owners acquired experience with rules that were to their advantage, they would follow good practices without compulsion. To this end, the Committee proposed, first, a draft forest-practice bill modeled after the Forest Conservancy Districts

Act of Maryland. Maryland's Act was patterned after the "Model Bill for Public Control of Cutting on Private Forest Lands" written by the Forestry Committee of the Council of State Governments (Schofield, 1962). A second Committee proposal was that the state should buy and reforest cutover lands that the owners were unable or unwilling to reforest. The Committee stated that this was necessary if complete federal ownership of the state's forest lands was to be prevented. Further Committee recommendations concerned the need to reorganize the State Board of Forestry; the need to achieve better watershed management, range improvement, and control of forest diseases and insects; and the need to revise the state's forest laws.

The Committee's draft Forest Conservancy Act, though its outline was borrowed from out-of-state, was redesigned for California forest conditions. The draft bill not only emphasized timber conservation, but also included provisions to promote such aims as water production, the encouragement of recreation, the preservation of wildlife and natural beauty, and the maintenance of taxes and payrolls. It called for the State Board of Forestry to create forest districts, each with a district board, and to seek the advice of these boards in establishing forest-practice rules.

3.3.1.2. The timber industry's response. Some vocal segments of the logger and timber-owner fraternities expressed disapproval of the Committee's draft bill. They said the Committee should have kept its hands off forestry matters other than strictly timber, considering that timber productivity was the problem the Legislature had directed the Committee to study (Schofield, 1962).

In response, some of the Committee members approached those representatives of the forest industry who had indicated their willingness to cooperate with a reasonable regulatory program. These members suggested that the industry draft a bill that it would regard as acceptable (Schofield, 1962).

The California Forest Protective Association, a timber-industry group, in 1944 had publicly espoused dividing the state into districts that would adopt self-regulatory forest-practice rules to promote maximum sustained timber production. Because its position was already publicly established and its membership was large and influential, the Association responded to the Committee members' request. The Association's Secretary wrote a draft bill for industry self-regulation based on the same "Model Bill for Public Control of Cutting on Private Forest Lands" that was the ultimate source of the Forestry Study Committee's draft bill (Schofield, 1962).

The Association's draft Forest Practice Act differed substantially from the Committee's. It confined the purpose of regulation to maintaining timber productivity and a continuous supply of timber products. Four forest districts were to be established. Within each, a forest practice committee would draft and adopt district forest-practice rules. Once adopted, the rules would then be submitted to the district's forest landowners. If the owners of 75 percent of the private timberlands in the district approved, the State Board of Forestry could then approve, reject, or modify the rules. However, to take effect, any changes requested by the Board would have to be approved, as before, by the district forest practice committee and

at least 75 percent (by acreage) of the district's forest landowners.

3.3.1.3. Compromise. After holding conferences with forest owners and loggers, the Committee produced a redrafted forest-practice act that incorporated the policy and the rule-making sections of industry's draft with only minor changes (Schofield, 1962). The legislature passed the redrafted bill without amending it. The Act went into effect on September 1, 1945.

3.3.2. Description of the 1945 Law

3.3.2.1. The districts and their committees. The Act divided the state into four forest districts: (1) Redwood, (2) North Sierra Pine, (3) South Sierra Pine, and (4) Coast Range Pine and Fir. Each district had a forest practice committee of five members. Four members were appointed by the governor, to serve at his pleasure and to represent specific interest groups: two private commercial timberland owner-operators; one private timberland owner, not an operator, who must hold more than 1,000 acres; and one farmer-timber owner holding between 160 and 1,000 acres of commercial timberland. A member or representative of the State Board of Forestry was the fifth committee member; his function was to serve as secretary and tie-breaker.

Each district forest practice committee had two primary duties: (1) to advise and assist the State Board, and (2) to develop forest-practice rules. Each committee was directed by the Act to ask timberland owners for management-plan suggestions from which rules could be developed. Once a set of rules was drafted, the committee was to hold public hearings on the draft before adopting it. The adopted

rules were then to be submitted to the timberland owners of the district and approval obtained from the owners of two-thirds of the timberland before the procedure could continue any further. Such owner approval was thought necessary to protect owners' property rights (Callaghan, 1974).

Once approved within the district, the rules were sent to the State Board of Forestry for hearings and review. The Board could approve, disapprove, or modify rules. Any modifications were cleared, as were the original rules, through the district forest practice committee and two-thirds (by acreage) of the timberland owners in the district before the State Board could finally approve and adopt them. Once the rules had been published, they had the force of law within the district. Upon petition by owners of half of the district's timberland, the State Board could propose amendments to the rules. These amendments had to undergo the same clearance process as already described.

3.3.2.2. State Board of Forestry. The State Board was reorganized by the passage of a companion bill to the Forest Practice Act. Its members were appointed by the governor to serve staggered 4 year terms. The membership was chosen so that one member represented the redwood producing industry, one member represented the pine producing industry, one member represented forest land ownership, one member represented the range livestock industry, one member represented agriculture, one member represented the beneficial use of water, and a seventh member represented the public at large (Landenberger, 1976). The Board's

duties were to develop and maintain an adequate forest policy for the state and to promulgate the forest-practice rules.

3.3.2.3. Administration and enforcement. Administration of the Act was delegated to the state forester, acting under the supervision of the director of natural resources and the State Board of Forestry. All loggers were required to register annually with the state forester to receive Timber Operator's Permits (cost, \$1). Operating without a permit was a misdemeanor, with a maximum punishment of a \$500 fine or 6 months in jail. The timber owner had to notify the state forester of his intention to cut. Inspections were made by the state forester to determine if the operation was in compliance with the district's rules. The responsibility for compliance lay with "the person who owns the tree when it hits the ground" (Callaghan, 1962:3). Although there was no specific penalty for noncompliance, if a violation was not corrected within a reasonable time after the timber owner was notified, the state forester could initiate injunction proceedings to halt the operation until the violation was corrected. Exemption from the Act was provided for (1) removal of dead, defective, injured, or infected trees; (2) clearing rights-of-way, landings, campsites, or firebreaks; (3) conversion of land to nontimber uses such as grazing, if approved by the State Board; and (4) operations under an alternative plan if it served the intent and purpose of the Act and was approved by the State Board.

3.3.2.4. Amendments to the Act. The Forest Practice Act was amended many times between 1947, when the rules became effective, and 1971,

when the Act's rules were declared unconstitutional by California's First District Appellate Court. In 1951 (Chapter 720), the district forest practice committees were empowered to amend the rules, subject to the State Board's approval, without submitting the changes to a vote by the landowners. Operators, when applying for a permit, had to agree to notify the state forester before beginning a logging job, and to comply with the rules. The permit was subject to cancellation by the director of natural resources for noncompliance. The amendment of 1957 (Chapter 1648) provided explicit exemption, from local government control, for timber harvesting in compliance with the district's rules or an approved alternative plan.

A major amendment was passed in 1963 (Senate Bill 565) to streamline the administrative procedures for bringing violators to trial, and to strengthen the enforcement tools (Arvola, 1970). The Timber Operator's Permit was made a license with an initial fee of \$15 and a fee of \$10 per year for renewal. Issuance of the license was contingent upon the operator not having any outstanding rule violations; if he did, the state forester could hold up the license until the operator corrected the violations. An injunction could be issued at the state forester's request, halting all logging in the state by any operator until violations on any one or more of his jobs were corrected. If, after notification, the operator did not correct a violation, the state forester could spend up to \$40 per acre for corrective measures and bill the costs to the operator or owner (Arvola, 1970). The director of conservation was given the power to enjoin an operator for a violation or a threatened violation of the rules.

Several amendments were passed in 1970. The membership of the State Board was increased to eight, by the addition of another representative of the general public (Chapter 366). Two members of the general public were added to each district committee, increasing the membership to seven (Chapter 1437). A reversal of the 1957 amendment allowed certain named counties to adopt regulations more stringent than the forest practice rules (Chapter 712).

In 1971, the correction costs that the state forester could charge were raised to \$100 per acre. The state forester was empowered to revoke any approved alternative plan not being followed and to revoke conversion permits when there was no bona fide intention to accomplish the conversion. A fine of \$100 to \$500 was authorized for conversion operations in violation of the rules if a conversion permit had not been obtained. New rule amendments for review and adoption by the districts could now be made by the State Board (California Division of Forestry, 1971). The landowners' power to reject rule promulgation was repealed (Chapter 752). However, in September 1971, the First District Appellate Court of California declared the Forest Practice Act's rule promulgating procedure unconstitutional in *Bayside Timber Company v. Board of Supervisors of San Mateo County*. This case is discussed in 3.3.4.2.

3.3.2.5. District forest practice rules. The single purpose of the Act limited the consideration of the district forest practice committees to establishing minimum standards that would ensure a continuous supply of forest products. These standards were designed to prevent

damage to the forest resource from fire, insects, disease, and improper harvesting and to ensure continued productivity by establishing minimum diameter limits, seed-tree requirements, and provisions for artificial regeneration where necessary.

The first forest practice rules went into effect in September 1947 with the overwhelming approval of the state's timberland owners (Landenberger, 1976). Before the Act was declared unconstitutional, the rules were amended four times. The first amendments, in 1953-54, established minimum stocking requirements and strengthened the slash-disposal and erosion-control provisions. In the 1959-60 (second) amendments, these provisions were again strengthened (Callaghan, 1962). The third and fourth rule amendments, in 1967 and in 1970, dealt with increased erosion control and stream protection (Arvola, 1970). For example, operators were required to minimize the number and width of skidding trails, the number of stream crossings, and the use of streambeds as skidding trails. All these amendments were at least superficially directed at fire control and maintaining soil productivity rather than fish-habitat protection.

3.3.3. Intent of the 1945 Law

The Forest Practice Act of 1945 was conceived at a time when the possibilities of timber shortage and federal regulation were of great concern. Passage of the Act reflected the fear of federal intervention. The public interest and policy statements in the Act reflected fear of the economic dislocation that would result from timber shortage. The public interest lay in "(1) the forest resources and forest lands in the state, (2) the necessity of good practice in harvesting forest

resources and in conserving and maintaining the productivity of forest lands in the interest of the economic welfare of the state and its industries, (3) the establishment of standards of forest practice and the administrative devices necessary to administer such standards" (Davis et al., 1956:10, 11). The expressed public policies were promotion, encouragement, and assistance of forest management to maintain a continuous supply of forest products and to aid private owners in the economic development of their lands.

Inclusion of broad conservation standards in the Act -- protection of aesthetic values, water quality, and streamflow -- was rejected by the legislature in favor of the strictly defined, single-purpose approach favored by forest industry. The amendments to the Act passed during the 1950s and 1960s were to strengthen and speed up administration and enforcement and to correct and strengthen the Act's wording (Callaghan, 1962). Amendments passed in the 1970s were designed to broaden public participation in policy and rule making.

Forest industry and landowners continued to insist upon maintaining the single purpose of the Act (Schofield, 1962). Little opposition to the single-purpose approach surfaced among the predominantly rural legislators, who were concerned with accommodating the rapid economic and population growth that was occurring, and not with environmental responsibilities of the timber owner and operator -- i.e., protection of fish and wildlife habitat and water quality -- were placed in the Fish and Game codes and in the State Water Quality Act (Callaghan, 1974). The Fish and Game codes control (1) the amount

and kind of materials that can be placed in or removed from streams; (2) the use of equipment in streams; and (3) construction and logging activities in streams. The State Water Quality Control Act provides for (1) administrative establishment of water-quality standards; (2) enforcement of the standards by injunctive proceedings to halt pollution or nuisance; and (3) establishment of regional water-quality control plans that place a limitation on, or prohibit, the discharge of wastes such as slash, soil or sawdust.

3.3.4. Historical Background: 1973 Z'berg-Nejedly Forest-Practice Act

3.3.4.1. 1947 to the Bayside Case. With the adoption of the forest-practice rules by the district committees in 1947, the California Division of Forestry inspectors began their enforcement of the 1945 Forest Practice Act. In the beginning, some operators were actively opposed to the Act, and many were indifferent (Dewitt, 1952). Because of this, and the difficulty of interpreting the general wording used in the rules, the initial enforcement tools were persuasion and education (Callaghan, 1962). Dewitt (1952) saw a trend, developing as a result of the Division's educational campaign, toward a more conscientious effort by operators to apply better forest-management practices. The first attempt at enforcing the rules by injunction was made in 1950, but was aborted when an agreement on corrective measures was reached with the operator before the case came to trial (Callaghan, 1962).

During the 1959-60 rule revisions, the State Department of Fish and Game attempted to persuade the district committees to include

rules for fish-habitat protection. These rules would have protected streams from siltation, modification, and blockage by timber operations. The committees considered the proposals and strengthened the erosion controls -- but to protect soil productivity, not fish-habitat (Callaghan, 1962).

Enforcement efforts were confounded by the length of time required to prepare and prosecute a case, although one permit was suspended in 1960, and eight were suspended in 1961. Enforcement was improved somewhat by the Act's 1963 amendments. Unfortunately, some of the worst violations brought to the state's attention occurred on lands being converted to other uses, mostly grazing, that were exempt from the Act (Arvola, 1962).

Despite the improvements made by the Act's amendment in 1963, there was still doubt about the adequacy of the Act and the sufficiency of its enforcement. Because the administrative procedure was still cumbersome, the state forester could prosecute only a few violators at a time. The result was that enforcement efforts were concentrated on operators with more than one serious rule violation (Calhoun, 1966). Unfortunately, damage from noncompliance was often complete before the operator's permit could be revoked (Stoddard, 1968).

The Assembly Committee on Natural Resources conducted extensive public hearings on these problems during 1966. It found what it believed to be a widespread disregard for fish-habitat management and erosion control during and following logging (California State Legislature, 1966). The director of fish and game blamed logging for land-

slides and heavy siltation in the Redwood District. The conversion exemption continued to be the subject of widespread criticism (Stoddard, 1968). The Committee proposed 11 amendments to the Act, but none was passed. Their intent was to make the Act more responsive to the public concern for stream and soil protection by requiring a cutting plan approved by the state forester, adding public members to the State Board and the district committees, giving the State Board power to propose and adopt regulations, and broadening the purpose of the Act (Arvola, 1970).

The controversy over the adequacy of the Act's protection of non-timber values had begun to heat up by the mid-1960s. When a severe flood caused considerable damage in the winter of 1964-1965, many people in northern California thought logging had been a major contributing factor, and the public pressed for a redwood national park. Accordingly, the state forester asked the State Board to order the district committees to review their rules. The third rule revisions were completed in late 1967, as mentioned previously.

By 1969, increased logging in the southern end of the Redwood District for the domestic and Japanese markets had produced considerable public agitation for county controls. Several counties passed their own forest practice regulations, but the regulations were struck down by the courts because the state had preempted the control of forest practices in the Act's 1957 amendment (Chapter 1648). A logging-permit system was established by the California Tahoe Regional Planning Agency. The State Board and the state forester requested the Redwood

District forest-practice committee to consider separate rules to control logging in the Redwood District's southern end, and for the Southern Sierra District Forest-practice committee to do the same for its lands within the jurisdiction of the California Tahoe Regional Planning Agency. By July, the Redwood District committee had made permanent changes; the Southern Sierra committee's changes were to be ready by the summer of 1971. Still not satisfied, the citizenry, with the support of the state's administration, pushed through the Act's 1970 amendments (Arvola, 1970).

In December 1971, the California Supreme Court refused to review the Appellate Court's decision in the Bayside case. This would have left California with no legally enforceable forest-practice rules. But in July 1971, the legislature passed Senate Bill 183, allowing the State Board to adopt emergency rules, to be effective for no more than 180 days. The Board promptly readopted the old rules and continued to readopt them -- until November 1974, when the rules developed under a new law went into effect.

3.3.4.2. The Bayside case. In 1969 the Bayside Timber Company obtained the necessary logging permit from the Division of Forestry, and a permit from the Division of Highways to connect the company's logging roads to the state highway. The San Mateo County planning commission ruled favorably on the application for county road and logging permits, but after local citizens complained about the company's past performances, the permits were disapproved by the San Mateo County Board of Supervisors. The company then sought and obtained a writ of mandamus

against the county's board of supervisors. The trial court ruled that the state had preempted forest-practice regulations by the 1957 amendment (see 3.3.2.4.) to the Forest Practice Act (Lundmark, 1975).

The judgment of the trial court was reversed by the First District Court of Appeal. Two lines of reasoning were used by the court to declare the Act's rule-promulgation procedure unconstitutional (Lundmark, 1975). (1) The Legislature had unconstitutionally delegated the question of environmental protection from destructive forest practices to individuals with a pecuniary interest in forest practices. The court used an overly broad definition of pecuniary interest to reach its conclusion. Pecuniary interest is commonly accepted to apply when an individual personally benefits by his actions as a public official, and not, as in this case, when he would be affected in the same way and to the same degree as all others in his business (Lundmark, 1975). (2) The composition of the district forest practice committees (see 3.3.2.1.) and the State Board of Forestry (see 3.3.2.2.) did not adequately represent nontimber interests. The Court did not consider the changes made in the committees' and the Board's composition by the Act's 1970 amendments (see 3.3.2.4.) enough to cure the infirmity. The forest landowner's power to prevent rule promulgation was repealed by the 1971 amendment, but this was not mentioned in the Court's final decision (Lundmark, 1975).

There was no finding of fact concerning (1) the adequacy of the rules based on the Act's intent, or (2) whether the Legislature had provided funding to enforce the rules adequately (Lundmark, 1975).

Nor was there finding of fact concerning the enforcement and the adequacy of the regulations to protect the environment from forest operations administered by the water-quality control boards and the Department of Fish and Game.

Thus the Court's reasoning would have produced the same decision even if superior rules had been promulgated under the Act. Lundmark (1975) found the Court's decision to be unfounded in precedent and a clear case of judicial overreaching to achieve environmental ends.

3.3.4.3. The Bayside aftermath. Immediately there began a political struggle between environmentalists and the timber industry over a new forest practice act. The Assembly Committee on Natural Resources, after several legislative hearings, commissioned the Institute of Ecology, University of California at Davis, to study the problem and draft a legislative proposal. The Institute's report, "Public Policy for California Forest Lands," came down squarely on the issue of public rights versus private property rights (Lundmark, 1975). In its legislative proposal, A.B.2346, the Institute reasoned as follows:

All land is a public trust. The public has a right to regulations that protect its interest in environmental quality. The State Board of Forestry should impose regulations to protect this trust and interest. All loggers should be required to follow a plan prepared by a registered forester, who would be responsible for the logger's compliance with the law (Lundmark, 1975). Stream protection and the maintenance of aesthetic values are of greater public concern than timber production.

Alleging that the Institute's bill disregarded private property rights and deprived the landowner of his management responsibility, the timber industry's lobbies opposed the bill (Callaghan, 1973). A bill, S.B. 1326, introduced into the Senate for industry, met the same fate, but for the opposite reasons (Landenberger, 1976).

An environmentally oriented bill, S.B. 361, was introduced into the Senate. In addition to the provisions in A.B. 2346, this bill required the state to establish wildlife refuges, recreation areas, and wilderness areas on private lands. The timber industry's lobbies, and in particular the California Forest Protective Association, persuaded the Senate to pass enough major amendments to the bill so that eventually they could support its passage by the Senate. The Assembly, however, refused to act on the bill before the 1972 legislative session closed, and 1972 ending without the final passage of a new forest-practices act (Callaghan, 1973).

In 1973, the Senate bill was reintroduced as S.B. 5 and passed the Senate without opposition. The Assembly Committee on Natural Resources defeated the bill by one vote. However, the Assembly managed to pass a similar bill, A.B. 227, over objections from the California Forest Protective Association. Negotiations to resolve the differences were begun. The author of A.B. 227, Chairman Z'berg of the Natural Resources Committee, accepted 149 amendments, mostly authored by the California Forest Protective Association. Chairman Nejedly, Mr. Z'berg's senate counterpart and author of S.B. 5, had several amendments added to A.B. 227 as a show of power (Callaghan, 1973). The final

version of the bill was, in effect, a combination of A.B. 227 and S.B. 5. Its passage, as the Z'berg-Nejedly Forest Practice Act of 1973, was supported by the Sierra Club and other conservationists (Lundmark, 1975) and the California Forest Protective Association (Callaghan, 1973).

3.3.5. Description of the 1973 Law

3.3.5.1. State Board of Forestry. The Z'berg-Nejedly Forest Practice Act reconstituted the State Board of Forestry. Its nine members are appointed by the governor for staggered 4-year terms and are subject to Senate confirmation. To best represent the public interest, the appointees are to be selected "on the basis of their education and professional qualifications and their general knowledge of, interest in, and experience with problems relating to watershed management (including hydrology and soil science), forest management practices, fish and wildlife, range management, forest economics, or land use planning" (Section 4631). Five members are to be drawn from the general public, three from the forest products industry, and one from the range and livestock industry. No public member shall have a direct financial interest in timberlands, nor at any time may the majority of the Board have a financial interest in timberlands.

The first duty of the State Board was to divide the state into at least 3 forest districts based on climate, soil type, principal forest crops, and other relevant factors. The Board chose to establish 3 districts, the Coast Forest District, the Northern Forest District, and the Southern Forest District. Next, the Board appointed in each district nine members of a 10-member district technical advisory committee (T.A.C.). The members of the T.A.C.s appointed by the Board

must have the same qualifications, and be drawn from the same interest groups in the same proportions, as the Board's membership. The tenth member is appointed from the Division of Forestry to act as secretary and tie breaker (Section 4531-4540).

The T.A.C.s are instructed to hold public hearings and consult with the state forester, concerned government agencies, schools, public and private interest groups, and individuals; and on this basis advise the State Board on rules for their districts.

District rules adopted by the State Board "to assure continuous growing and harvesting of commercial forest tree species and to protect the soil, air, fish and wildlife, and water resources" (Section 4551). In considering rules, the Board is to seek recommendations from the state forester, the Department of Fish and Game, the State Water Resources Control Board, regional water-quality control boards, the State Air Resources Board, and local air-pollution control districts, in their respective areas of concern. In formulating and revising the rules, the State Board is not only to receive the advice of the T.A.C.s, but also to consult with civic and public-interest groups and private organizations and individuals. The rules are to include, but are not to be limited to, provisions for (1) prevention and control of fire, insects, and disease; (2) control of soil erosion, water quality, and floods; (3) protection of young timber growth and soil productivity from unnecessary damage during timber operations; and (4) restocking of the forest. Except in emergencies, no rules or amendments are to be adopted without a public hearing.

3.3.5.2. Conservation standards. Stocking requirements, soil erosion, and waterway protection were deemed important enough to be legislated and not merely left to the rules.

Minimum stocking standards were set by the Act, although the State Board could adopt stricter standards for a district if justified by conditions. Within 5 years of an operation's completion, there must be at least 300 healthy trees, at least 2 years old, per acre. Advance reproduction is provided for by requiring that after 5 years, the residual basal area on site-I lands be at least 85 square feet per acre, and on site-II or poorer, 50 square feet per acre. A final restocking report must be filed by the landowner, certifying that restocking is complete.

The Board is directed to conduct soil-erosion control studies to determine permissible soil-loss levels and to "promulgate regulations for each district to govern timber operations that may cause significant soil disturbance" (Section 4562.5).

Finally, the Board is to "adopt rules for control of timber operations which will result or threaten to result in unreasonable effects on the beneficial uses of the waters of the state" (Section 4562.7). These rules are to provide for (1) disposal of wastes, such as sanitary wastes, trash, petroleum products, and cleaning agents, to avoid stream contamination; (2) construction of road and trail stream crossings to provide substantially unimpaired water flow and free passage for fish; (3) minimizing damage to unmerchantable riparian vegetation; (4) minimizing streambed and bank damage from logging operations; and (5)

"control of slash, debris, fill, and side cast earth . . . which may be carried into streams" (Section 4562.7).

3.3.5.3. Timber operator's permit program. The State Board of Forestry administers the operators'-license program (Sections 4571-4577). The Board can, and does, delegate its authority to the state forester after establishing the necessary fees and regulations (Sections 1020-1031.1, Subchapter 4.1, Chapter 2, Division 2, Title 14, California Administrative Code). All timber operators are required to obtain a Timber Operator's Permit (T.O.P.) from the state forester before they can engage in logging. The license fees set by the Board are \$75 for the T.O.P., with an annual renewal fee of \$50. A T.O.P. may be denied to a logger convicted within 1 year of operating without a permit or failing or refusing to comply with the Act's rules. The state forester may also deny a renewal application until outstanding violations are corrected. In either case, the operator may appeal the denial to the State Board of Forestry.

3.3.5.4. Timber harvesting plan (Sections 4582 and 4584). The timber owner planning to conduct a timber operation must file with the state forester a timber harvesting plan (T.H.P.) prepared by a registered professional forester (Section 4582). The T.H.P. must include (1) a complete legal description of the area to be logged; (2) the expected operating period (a maximum of 3 years); (3) the product to be harvested; (4) a map locating soils by erosion-hazard rating, all streams and bodies of water, existing and proposed roads, special-treatment areas, slides, areas of potential abnormal soil movement or slope instability, and stream crossing, by type; (5) a description of methods to be used

to avoid excessive accelerated erosion in the stream- and lake-protection zones and to minimize soil excavation and erosion, and the special steps to be taken in areas of high or extreme erosion potential; and (6) anything else required by the Act or by the district rules.

Before the Act was amended, the state forester had 15 days from the filing date to review a T.H.P. for conformance with the Act and the rules and to return it for additional work. If the state forester did not return the T.H.P., the operator could proceed. Twenty-five days were allowed if the state forester decided that an inspection was necessary.

Operations likely to have only a minimum environmental requirement, not a T.H.P., but merely notification of the state forester. They are (1) timber operations on less than 3 acres; (2) harvesting of Christmas trees; (3) harvesting of dead, dying, or diseased trees making up no more than 10 percent of the total timber volume; and (4) harvesting of fuelwood and split products (Section 4584).

3.3.5.5. Enforcement (Sections 4605 - 4609). To enforce the Act, the state forester is required to make a series of inspections. A pre-operational inspection is optional. Mandatory inspections are (1) during the commencement period, (2) when the operation is well under way, and (3) within 6 months after completion. Other inspections can be made at any time, at the discretion of the state forester. After receiving the 5-year stocking report, he makes a final inspection.

If he discovers a violation or threatened violation, the state forester can bring court action to enjoin the operator. When the court finds a threat of immediate and irreparable harm to the soil or

water, it must order the defendant or the state forester to take corrective action. Any costs incurred by the state forester in correcting the violation constitute a lien upon the land. After a hearing, if the operator is found in violation of the Act, the court can enjoin him on all his operations in the state or require him to post a bond to ensure prompt corrective action. Violation of a rule is a misdemeanor, punishable by a maximum \$500 fine or 6 months in jail or both. After the court issues a corrective order, the operator is guilty of a separate offense for each day the violation remains uncorrected.

3.3.5.6. Conversion permit program (Sections 4621 - 4628). To convert commercial timberlands to other uses, an application must be filed with the State Board of Forestry for approval, subject to any locally required rezoning or use permits (Sections 4621-4628). The landowner cannot begin the conversion without an approved Timberland Conversion Plan (T.C.P.). This plan does not have to be prepared by a registered professional forester, but it must contain most of the information required for a T.H.P., except for that on timber stocking and silvicultural methods. The state forester may deny or revoke an application when there is no bona fide intention to convert, or for refusal or failure to comply with the rules. If he receives a denial or revocation, an applicant has the right to appeal to the State Board of Forestry. Public agencies are not required to file applications for the construction or maintenance of rights-of-way on public lands. The State Board delegated to the state forester on July 7, 1974, its authority and responsibilities for the administra-

tion of the foregoing sections of the Act (Sections 1101-1108, Subchapter 4.1, Chapter 2, Division 2, California Administrative Code).

3.3.5.7. Other authorities (Sections 4514 and 4516). The 1973 Act does not limit (1) the power of any city or county to abate a public nuisance; (2) the responsibility of the attorney general to enjoin a person for creating pollution or nuisances; or (3) a private individual seeking action to abate a private nuisance. Any state resident can seek a writ of mandate from the courts to compel the state forester and the State Board to enforce the Act (Section 4514). The California Tahoe Regional Planning Agency and any California county can adopt regulations that are stricter than those provided by the Act (Section 4516).

3.3.5.8. Registration of professional foresters. Explicit in the Act is a program to register professional foresters. The State Board of Forestry adopted regulations for this purpose and established an Examining Committee to review qualifications and to administer examinations on March 7, 1973 (Section 1601-1650, Subchapter 10, Chapter 2, Division 2, California Administrative Code). To qualify as a professional forester, a person must have at least 7 years experience in forestry work, with at least 3 of those years in charge of forestry work or under the direct supervision of a registered or qualified forester. A Bachelor of Science degree in forestry can be substituted for 4 years of work experience, and a Master of Forestry degree for 1 year of supervisory work. The Examining Committee can deny an application when the evidence received indicates insufficient qualifying experience and education or the lack of a good moral

character or a good reputation for honesty and integrity (Section 1624.1). If qualified, the applicant must pass with a grade of at least 75 percent, a written examination administered by the Examining Committee. Denial of an application on either point may be appealed to the State Board of Forestry.

In connection with forester registration, the Board established a fee structure and a Code of Ethics. It provided for a \$15 application fee and a \$35 annual license fee. The Code of Ethics defines a professional forester's relationships to his profession, his employer or client, and the public. A forester's license can be revoked or suspended, however, the only causative guideline provided is the Code of Ethics.

3.3.6. Intent of the 1973 Law

3.3.6.1. Statement of policy (Section 4512). The policy statement in the 1973 Act contains four declarations. The first is that the public has a great concern for the utilization, restoration, and protection of forest resources and timberlands because they are one of the state's most valuable natural resources. The second "declares that the forest resources and timberlands of the state furnish high-quality timber, recreational opportunities, and aesthetic enjoyment while providing watershed protection and maintaining fisheries and wildlife" (Section 4512(b)). Because of the public concern for these benefits, the Legislature established as state policy the encouragement of "prudent and responsible forest resource management calculated to serve the public's need for timber and other forest products, while giving consideration to the public's need for watershed protection, fisheries

and wildlife, and recreational opportunities alike in this and future generations" (Section 4512(c)). The Legislature included a disclaimer assuring timberland owners that the Act was not an attempt "to take private property for public use without payment of just compensation" (Section 4512(d)).

3.3.6.2. Statement of intent (Section 4513). The intent of the Legislature in passing the 1973 Act was "to create and maintain an effective and comprehensive system of regulation and use of all timberlands" (Section 4513) to achieve two goals. The first goal is to ensure that "where feasible, the productivity of timberlands is restored, enhanced, and maintained" (Section 4513(a)). The second is to achieve "maximum sustained production of high-quality timber products . . . while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, and aesthetic enjoyment" (Section 4513(b)).

These statements seem to leave little question that the Legislature intended the Act's regulatory program to be comprehensive, governing all aspects of timber operations in the state, subject to the power of (1) other authorities or persons to abate nuisances, (2) state agencies to enforce laws for which they are responsible (Section 4514), and (3) counties and the California Tahoe Regional Planning Agency to adopt stricter controls than rules resulting from the Act (Section 4516).

3.3.7. Subsequent Developments

3.3.7.1. The first drafting of rules. The three T.A.C.s, during July 1974, prepared the first drafts of the district forest-practice rules according to the statutory provisions for public hearings and

consultation. The State Board held public hearings on the drafts in early August to review and coordinate the T.A.C.s' efforts. Following input from the Board's subcommittees and another round of public hearings, the T.A.C.s produced a second set of draft forest-practice rules (Callaghan, 1975).

The State Board held public hearings September 25-27, 1974 and, after much review and revision, adopted rules for each of the three districts. However, two groups of participants were unhappy with the results (Callaghan, 1975). First, the Sierra Club and other environmental groups believed that the rules did not provide adequate protection for water quality, aesthetic values, and wildlife habitat. Second, holding the same belief, the State Fish and Game Department attempted to get amendments passed to require changes in the rules for fish and wildlife protection. The Department also "promoted the concept that the state forester should have discretion to require changes in timber harvest plans to accomplish 'environmental' protection over and above the limits prescribed by the forest-practice rules" (Callaghan, 1975:3). However, the consensus was that there was no justification within the Act for this concept, since the Act clearly states in Section 4552 that the rules are to serve as standards for T.H.P.s, and in Section 4582.7 that the state forester is "to review the plan to determine if it is in conformance with the rules and regulations of the board and with the provisions of this chapter."

3.3.7.2. The legal and administrative morass. Three events occurred during the next 4 months that significantly changed the administration of the Act. First, in late November 1974, the state's attorney general

system has become known as the "Functional Equivalent System."

To implement the system, Secretary Dedrick deleted her January 29 significant impact criterion and substituted a categorical exemption from the C.E.Q.A. for regulatory programs that she certified as being the functional equivalent of the E.I.R. review process (Lundmark, 1975). March 4 brought new T.H.P. processing regulations, appropriately certified by the secretary. An "Environmental Addendum" containing information not required in T.H.P.s -- in effect a mini E.I.R. -- had to be filed in addition to the T.H.P. (Callaghan, 1975). The T.H.P.s continued to pile up because (1) the Fish and Game and the Water Quality Control Board team members were unable to agree on what constituted adequate mitigation of environmental problems, and (2) many T.H.P.s had to be returned for additional environmental information (MacLean, 1976).

By mid-March, the situation had become critical. The governor ordered the review teams to eliminate the backlog of unprocessed T.H.P.s. He placed the state forester's staff in complete control, and in a matter of days several hundred were processed, many in violation of the regulations because they lacked the necessary environmental data (MacLean, 1976).

By this time, nine bills had been introduced into the Legislature in an attempt to stabilize the situation. The bills ranged from a temporary exemption of T.H.P.s from C.E.Q.A. to an outright repeal of C.E.Q.A. (Lundmark, 1975). After much debate, S.B. 476 passed on June 30, 1975, exempting T.H.P.s from the E.I.R. process until December 31, 1975, and operations begun thus until June 1, 1976 (Section 4514.3). The Director of Conservation adopted emergency regulations on July 2

issued a letter of opinion stating that provisions of the California Environmental Quality Act (C.E.Q.A.) -- specifically, the requirement for an Environmental Impact Report (E.I.R.) -- applied to timber-harvesting plans (Lundmark, 1975). The second event, early in January 1975, was the appointment by Governor Brown of Ms. Claire Dedrick, then a Sierra Club vice-president, as Secretary for Resources. Mr. Larry Moss, a staff executive for the Sierra Club, became the deputy secretary shortly thereafter (Callaghan, 1975). Third, on January 16, 1975, the judge of the Humboldt County Superior Court ruled that the state forester's approval of T.H.P.s was not a ministerial act, but a discretionary act (Lundmark, 1975). A ministerial act is simply a check of a project's conformity with the applicable rules, while a discretionary act requires the exercise of judgment in approving or rejecting a project (Section 15024, California Administrative Code). This finding placed T.H.P.s under the provisions of the C.E.Q.A. that require an E.I.R. Rather than appealing the Court's decision, the secretary stated that all T.H.P.s would require an E.I.R. for approval, in conformity with the attorney general's opinion and the decision of the Court (Callaghan, 1975).

Now that timber-harvesting plans could not be processed without an E.I.R., they began to pile up. To cope with the situation, on January 24, 1975, the secretary amended Section 15024 and added paragraph (c) 10 to Section 10581 of the California Administrative Code (Callaghan, 1975). The first amendment added a statement declaring that a T.H.P. is "a discretionary project within the meaning of the California Environmental Quality Act," and therefore requires an E.I.R.

The amendment also prevented T.H.P.s from being filed until all required environmental documentation was received. The added paragraph established guidelines specifying when a timber operation would require an E.I.R. -- i.e., have a significant environmental impact -- apparently "without regard to the forest-practice rules" (Callaghan, 1975:5).

To process T.H.P.s with the new E.I.R. requirement, an inter-departmental review team was set up at the Forestry Division's four regional processing centers. Each team was made up of representatives from the Division of Forestry, the Departments Fish and Game, and Parks and Recreation, and from the Water Quality Board. Each member was given the power to veto a T.H.P.'s approval. A few T.H.P.s, those that did not require an E.I.R., were processed. However, the majority of T.H.P.s did require an E.I.R., and the review process bogged down (MacLean, 1976). Hundreds of loggers demonstrated in Sacramento to protest (Callaghan, 1976).

Governor Brown reacted to this situation on February 17, 1975, by issuing an executive order establishing a streamlined T.H.P. review process that was functionally equivalent to the E.I.R. review process (Callaghan, 1975). The state forester's representatives on the review teams were given sole power to approve or reject a T.H.P. under Section 4582.7 of the Forest Practice Act, although this section requires only review for conformance, and not approval. The other members of the review team were directed to assist in the review process and to comment on the impacts that the timber operation would have on the goals and values listed in Section 4513(b). This processing

(Callaghan, 1975) to cover the period between the passage of S.B. 476 and the effective date of new regulations passed by the State Board of Forestry to implement the act. The director retained the inter-departmental review team to ensure adequate environmental protection: The team's function was to state its recommendations for rejection if they thought a T.H.P. failed to provide for environmental values. But sole power to approve or reject T.H.P.s was left with the state forester's representatives. They were required only to state their reasons for overruling the review team. A previous requirement that no T.H.P. be approved if the operation would cause substantial adverse impacts was dropped. Although the Environmental Addendum requirement was formally continued, the T.H.P. was processed without it if the operator refused to supply information beyond the requirements for a T.H.P. (Callaghan, 1975).

3.3.7.3. The second drafting of the rules. The Board appointed an ad hoc committee, composed of members of the State Board of Forestry, public agencies, the Sierra Club, the California Forest Protective Association, and the Associated California Loggers to review the November 9, 1974 rules and determine what changes were necessary to achieve improved environmental protection (Callaghan, 1975). The governor's office and Secretary Dedrick informed the committee that they would support an exemption for T.H.P.s from the C.E.Q.A. on three conditions: (1) that the rule changes provide adequate environmental protection; (2) that the state forester's staff be allowed discretion to require changes in a T.H.P. for improved environmental protection if they believed that the forest-practice rules were inadequate; and (3)

that the public have the right to appeal a T.H.P. approval to the State Board of Forestry.

After many public hearings by the State Board and the district T.A.C.s, new district rules were adopted June 30, to be effective August 25. These new rules, representing primarily the view of public agencies, significantly increased stream protection and other environmental safeguards (Callaghan, 1975).

3.3.7.4. The new T.H.P. processing regulations. The new rules for T.H.P. processing under S.B. 476, were adopted on July 1, 1975, and went into effect September 1 (Sections 1032-1045, California Administrative Code). The director of conservation's emergency regulations were then dropped. A T.H.P. received at a regional processing center under the new rules is reviewed by the state forester's staff for accuracy, completeness, and order, and to determine if a preoperational inspection is needed. Within 5 working days, the T.H.P. must be accepted for filing or returned to the submitter with an explanation of what corrections are needed (Section 1037).

When a T.H.P. is accepted for filing, notification must be sent within 2 working days to (1) the person submitting the plan; (2) the clerk of the effected county, to be posted in a public place; and (3) the permanent Division of Forestry office in the county, to be posted (Section 1037.1). The regional offices must maintain a list of all T.H.P.s filed in their region and furnish copies on request, at a cost of no more than 25 cents per page (Section 1037.2).

After a T.H.P. has been filed, a copy is retained at the regional office for public display, and other copies are sent to (1) the Depart-

ment of Fish and Game, (2) the Department of Parks and Recreation, (3) the appropriate regional water-quality control board, (4) the county planning agency, and, if within their jurisdiction, (5) the California Tahoe Regional Planning Agency and (6) the regional Coastal Zone Conservation Commission. Copies of specific T.H.P.s are available on request from the appropriate regional office, at cost. Written comments concerning the T.H.P. are considered by the state forester's staff in evaluating the T.H.P. (Section 1037.3). Within 15 days of the filing date or the preoperational inspection, the staff must "determine if the plan is in conformance with the applicable rules and regulations of the Board and with the provisions of the Forest Practice Act" (Section 1037.4).

After a T.H.P. is determined to be in conformance, the person filing the plan is notified that he may begin operations. Within 10 working days, a notice of conformance must be posted in the places specified in Section 1037.1 and sent to the agencies specified in Section 1037.3 and to the secretary of resources. This notice must include a written response "to significant environmental points raised during the evaluation process" (Section 1037.7, adopted on an emergency basis December 17, 1975; effective January 1, 1976).

When a plan is not in conformance, it is returned to the submitter with a statement of the changes necessary to achieve conformance and an offer to have a registered professional forester confer on the site to reach agreement on the needed changes. "In returning such plans, the state forester may state reasonable conditions that in his professional judgment are necessary to reasonably prevent or mitigate any

significant or substantial physical damage to lakes, streams, fisheries, and wildlife, provided however that such conditions shall meet the intent and purposes of the . . . act" (Section 1037.5). The submitter may appeal a nonconformance determination of the State Board of Forestry for a public hearing.

3.3.7.5. The future. At present the Forest Practice Act is controlled by S.B. 707, passed on September 12, 1975. This bill extends the exemption from the C.E.Q.A., until January 1, 1978, and provides for a permanent exemption if the secretary of Resources certifies that the environmental safeguards in the rules are adequate. The secretary and key legislators had stated that the new rules adopted in August and September 1975 would be sufficient, and a full and permanent exemption would be forthcoming. To date, no permanent exemption has been passed. Neither the forest industry nor the environmentalists are particularly satisfied with the present situation, and future developments are uncertain (Popovich, 1976). The Assembly Committee on Resources, Land Use, and Energy has begun a comprehensive review of the Act (Unkel, 1977). Legislation has been prepared to significantly tighten the environmental safeguards (A.B. 1239, 1977).

3.4. Oregon: The Forest Conservation Act, 1941 (Chapter 237)
and the Forest Practices Act, 1971 (Chapter 316)

3.4.1. Historical Background: 1941 The Forest Conservation Act

From 1867 to 1940, Oregon passed seven laws affecting forest lands: five for fire control, one creating the State's first Board of Forestry, and one establishing a special tax upon commercial forest lands.

The first, in 1867 was a forest fire escape law. This law made it an offense for a person to start a fire on his land and allow it to spread to his neighbor's property (Rogers, 1942).

A Board of Forestry was created by the State Legislature in 1907. Its purpose was to report to the Legislature the following year on what could be done to improve forest-fire detection. The Board was "composed of the Governor, Secretary of State, the forest warden, the forestry officer of the agricultural college, and three electors appointed on recommendation of lumber or forestry interests" (Morse, 1974:3).

The Board of Forestry report and the continuing loss of life and property every year from widespread forest fires resulted in the legislature passing the Forestry Act of 1911. The Act reconstituted the Board of Forestry and charged it with supervising the state's Forestry Department. The duties of both bodies at this time were strictly forest-fire detection and control (Rogers, 1942). The new Board consisted "of the Governor, the acting head of the forestry school at Oregon Agricultural College, and five electors to be appointed by the Governor on recommendations of the Grange, Oregon Forest Fire Association, lumber manufacturers, the U. S. Forest Service, and the Wood Growers" (Morse, 1974:3).

In 1913, the Legislature passed the Fire Patrol Act. All forest landowners were required to patrol their lands for forest fires. The owner could operate the patrol alone or through the Forestry Department or through a private cooperative association. A tax on timberlands was provided to finance the forest-fire detection and control

system (Morse, 1974).

In the Deferred Taxation Act of 1929, the state tried for the first time to get forest landowners to reforest their lands after harvest and thus achieve continuous wood production. Owners of commercial timberlands enrolled under the Act paid a minimal yearly tax until harvest, when they paid a higher realization tax (Morse, 1974). The important contribution of the Act was to develop "a forest tax consciousness among the general public that now recognizes that the forest is a crop" (Rogers, 1942:385). Later regulatory programs relied heavily on the precedent established by a provision of the Act requiring landowners to obtain permits from the state forester before cutting enrolled forests (Rogers, 1942).

Two forest-fire control laws were passed by the legislature in 1933. The first expanded the old snag-felling law so as to make it applicable, not simply to "dead trees around engine settings," but also to "all dead trees in green timber stands . . . west of the summit of the Cascade Mountains. It was a radical departure in state regulation of private forest land" (Rogers, 1942:385). Following the Tillamook burn in the summer of 1933, the legislature was called into special session and passed the Operator's Permit Law. Under this law, commercial timber operators were required to obtain permits from the state forester. Operators had to take every reasonable precaution to prevent the escape of fire. A weather instrument for determining relative humidity and temperature had to be maintained on every logging job. Every operator was sent the forest closure requirements issued by the state forester before each logging season. These requirements were

based on temperature, relative humidity, and wind conditions. Operators had to shut down on high-hazard days or parts of days. The state forester was empowered to shut down indefinitely all operations in the state during periods of extremely hazardous logging conditions (Rogers, 1942).

In January 1940, the governor attached to the State Economic Council a newly-created Forestry and Land-Use Subcommittee. Its purpose was to develop a coordinated legislative program to meet four objectives: (1) strengthen the fire-detection and -control system; (2) improve the state's forest-land acquisition program; (3) create a wood-wastes research division; and (4) regulate commercial timber harvesting (Rogers, 1942).

After consultation with public agencies and private associations, the Subcommittee completed a program proposal for legislative action in 1941. The Subcommittee rewrote most of the old fire-control law to modernize it and clarify its meaning. The Subcommittee proposed changes in the forest-acquisition law: (1) Counties would be permitted to transfer title to their forest lands to the Forest Department, which would manage the lands on a sustained-yield basis and return to the counties 75 percent of the revenues from the sale of timber and grazing rights. (2) Individuals could sell their forest land to the state; revenues from such land would be split fifty-fifty between state and county after deducting acquisition and fire-control costs. Furthermore, provision was made for the state to set up sustained-yield units by blocking its timberlands with other public or with private timberlands. (3) The new research division was to begin work on a survey

to determine how much wood was being left or burned at the logging site and to explore ways to "balance the forestry budget" (Rogers, 1942:386). With the strong encouragement of the forest industries, the Legislature translated these Subcommittee proposals into law (Morse, 1974).

(4) The fourth and most important legislative proposal by the Subcommittee was that a Forest Conservation Act be passed. The Subcommittee proposed a draft act that had been written by the Joint Conservation Committee of the West Coast Lumberman's Association and the Western Pine Association (Rogers, 1942). This prestigious backing, combined with heavy support from professional foresters and the Board of Forestry, ensured the Legislature's quick passage of the draft (Morse, 1974).

3.4.2. Description of the 1941 Law

3.4.2.1. Promulgation of rules and regulations. The regulations established in the Forest Conservation Act were concerned only with reforestation. Based on climate and forest type, Oregon was divided into two parts -- the East Side and the West Side of the Cascade Mountains, with separate rules for each. On the East Side, minimum diameter limits were established for ponderosa pine. Seed tree requirements were set for ponderosa and lodgepole pines. On the West Side, a single set of seed-tree requirements was established to cover all commercial tree species. Before logging was started, the state forester could approve the substitution of any practical reforestation method for the seed-tree requirements. On both sides of the Cascades, the operator was responsible for protecting seed trees from slash fires (Davis et al., 1956).

The state forester was empowered to promulgate rules and regulations to clarify the provisions of the Act and to facilitate its enforcement. Such action required the approval of the Board of Forestry (Davis et al., 1956).

3.4.2.2. Administration, enforcement, and exemptions. The administration of the Act by the state forester was put under the direct supervision of the Board of Forestry. All commercial timber operators had to obtain an annual operator's permit from the state forester. Each operation was to be inspected at least once a year to check for compliance with the reforestation requirements. If asked, the state forester could help lay out an operation to achieve compliance (Davis et al., 1956).

After three notices of delinquency in achieving compliance, the state forester could seek an injunction to halt the offending operation. The state forester was empowered to spend up to \$100 per 40 acres to correct the bad practice, the cost becoming a lien on the property (Rogers, 1942).

Exemptions from the Act were provided for (1) timber stand improvement; (2) conversion of forests to agricultural, mining, business, or residential uses; and (3) clearing rights-of-way (Davis et al., 1956).

3.4.2.3. Amendments to the Act. The Act was amended in 1943 (Chapter 142) to require the state forester to notify both the landowner and the operator when a violation was discovered. In 1947 the Act was amended (Chapter 294) to require the landowner or operator to post bond of \$16 per acre in violation within 30 days of their notification

of the violation, unless the operator appealed the decision to the Board of Forestry. The operator could have his permit suspended for refusing to post bond. If the land failed to restock naturally, or was not planted, within five years, that portion of the bond needed by the state forester to restock the land, up to \$16 per acre, was forfeited (Davis et al., 1956). In the early 1960s the bond requirement was raised to \$25 per acre. Provision was also made to allow the state forester to collect all correction costs. If the cost was greater than the bond, the extra cost became a lien on the property (Oregon Forest Conservation Act Conference, 1968). All amendments were passed without controversy. Their purpose was to improve enforcement of the Act by bringing penalties into line with the actual cost of correcting violations.

3.4.3. Intent of the 1941 Law

The stated policy of the Act was "the preservation of the forest, conservation of forest resources for the equal and guaranteed use of future generations, protection of forest and water resources, and the continuous growth of timber on lands suitable therefore" (Section 527.030). To accomplish this policy, the Act was designed to ensure that lands harvested from that time on would become restocked with commercial tree species within a reasonable time. Although water resources were referred to in the Act, there was never any "application of this phase of the policy statement in the administration of the Act" (Oregon Forest Conservation Act Conference, 1968:2).

As in the other states, Oregon's forest industry was concerned

about the imminent threat of federal regulation. The industry's apprehension and the fact that the two largest western lumber associations had written the Act, led the industry to demand that the Act be strictly enforced (Rogers, 1942).

3.4.4. Historical Background: 1971 Forest Practices Act

In the mid 1960s, public concern for the quality of the air and water resources in Oregon became widespread (Stoltenberg, 1976). In response, the State Board of Forestry sponsored the Oregon Forest Conservation Act Conference in August, 1968. Well-known leaders in government, forest industry, and the environmental movement were brought together to discuss the protection of environmental resources not covered by the Forest Conservation Act.

From the conference came a real consensus that the state needed to enter the field of environmental controls on timber operations. It was decided that the State Department of Forestry should be the focus of further efforts to regulate timber operations. The vast majority of participants favored broadening and modernizing the Act by amendment rather than drafting a new law (Stoltenberg, 1976).

In September 1968, the Board appointed a committee to cooperate with the Department of Forestry in studying the situation and making recommendations. About this time, the State Environmental Quality Commission enacted water-quality standards and issued a proposal for regulations to reduce water pollution from timber operations. The Board and its committee were convinced that if they did not provide adequate environmental safeguards, other agencies would. Rather than

have a multitude of agencies enforcing rules, the Board decided that a single-agency approach would be better. The act under consideration would have to include adequate protection for forest resources other than timber -- i.e., air, soil, water, fish, and wildlife. A decision was reached that a new law should be drafted -- not just amendments to the old act (Stoltenberg, 1976).

By March 1970, the committee had prepared a draft for the Board to review. More than 1,200 copies were sent to interested parties for their reaction and suggestions (Schroeder, 1972). The majority of the respondents were in favor of broadening the application of the state's forest-practice regulations, and concentrating enforcement responsibilities in one agency. There was a consensus that forest management now had to include more than just prompt regeneration and growth of trees. The primary objections to the draft bill were that it might affect land use adversely and that it gave too much authority to the Board (Manock, 1970).

The committee wrote a revised draft based on the comments it received, and submitted the draft to the Board in January 1971. The Board approved the draft and sponsored it in the 1971 Legislative Assembly. With strong support from the Board, the Department of Forestry, and the forest industries, the Oregon Forest Practices Act passed in both houses with large majorities in May 1971, with an effective date of July 1, 1972 (Morse, 1974).

3.4.5. Description of the 1971 Law

3.4.5.1. State Board of Forestry. Although the composition of the

Board is not specified in the Act, it is mentioned at this point for information. The Board's voting membership is the dean of the School of Forestry at Oregon State University (ex officio) and ten others appointed by the governor for staggered 4-year terms. Of the ten appointees, six must work in an administrative position for the producers or manufacturers of forest products, (1) three from west of the Cascade Mountains and north of Lane County, (2) two from west of the Cascade Mountains and south of Lane County's northern boundary, and (3) one from east of the Cascade Mountains. The other four are chosen separately, based on recommendations from (1) the Association of Oregon Counties; (2) the Oregon Farm Bureau, State Grange, and Farmer's Union; (3) the Western Oregon Livestock Association, the Cattlemen's Association, and the Woolgrower's Association; and (4) the Izaak Walton League, Oregon Wildlife Federation, and State Labor Council, AFL-CIO. There are three nonvoting members: (1) the president of the Oregon Forest Protective Association; (2) the regional forester, U. S. Department of Agriculture, Forest Service; and (3) the state director of the Bureau of Land Management (Morse, 1974).

The Board is required to supervise all aspects of forest policy and management in the state and to approve all claims for expenses incurred under the Act (Section 527.710). To accomplish the purposes of the Act the Board must promulgate rules to be administered by the state forester establishing minimum standards for forest practices in each region or subregion, relating to the following: (1) a reforestation of commercial forest land; (2) road construction and maintenance operations on forest land; (3) harvesting of timber; (4) application

of chemicals on forest land; and (5) disposal of slash on forest land. Before the Board can promulgate forest-practice rules, it is required to consult with state and local agencies concerned with "forest tree species, soil, air, and water resources" and fish and wildlife habitat (Section 527.630 (1)).

The forest practice rules promulgated by the Board must "be designed to meet the objectives of the rules and regulations of the other agencies in so far as they pertain to forest land (Section 527.720). Compliance with the forest practice rules, if approved by the agencies involved in the consultation process, is prima facie evidence of compliance with the rules and regulations of those agencies.

3.4.5.2. Forest regions and the forest practice committees. The Act directs the Board to establish no less than three forest regions for the purpose of rule promulgation and administration (Section 527.650). They chose to establish three. For each region the Board appoints a nine-member forest-practice committee, with staggered 3-year terms. A majority of the members of each committee must live within the region, and two-thirds must be private forest landowners, timber owners, or their authorized representatives. All members must be qualified by education or experience in natural resource management. The state forester assigns one of its staff to act as secretary, but without a vote.

The forest-practice committees' duty is to "recommend forest-practice rules appropriate to the forest conditions within their regions to the Board" (Section 527.660).

3.4.5.3. Administration, exemptions, and enforcement. The Board of Forestry appoints the state forester to serve at its pleasure as the chief executive officer of the Department of Forestry. The primary duty of the office "is to enforce all laws pertaining to forest land and prosecute all violations of such laws" (Morse, 1974:9).

Either the timber operator, the timber owner, or the forest landowner must notify the state forester before operations commence (Section 527.630). After receiving the notification, the state forester notifies the State Department of Revenue and the county assessor, and sends a copy of the notification to whichever of the operator, timber owner or landowner did not submit the notification. All three are sent copies of the forest-practice rules that will apply to the operation. Notification is required for "(1) the harvesting of forest crops including felling, bucking, yarding, decking and hauling; road construction or improvement within the operation area described; and treatment of slashing; (2) road construction or reconstruction of existing roads not within operation areas; (3) site preparation; (4) application of insecticides, herbicides, rodenticides, and fertilizers; (5) clearing forest land for change to nonforest uses; (6) treatment of slashing after completion of operations; and (7) pre-commercial thinning" (Oregon Forest Protective Association, 1972:6).

Notification is not required "for routine road maintenance, recreational uses, grazing by domestic livestock, tree planting and direct seeding, cone picking, culture and harvest of Christmas trees on lands used solely for the production of Christmas trees or the harvesting of fern, huckleberry, salal or other minor forest products"

(Oregon Forest Protective Association, 1972:6, 7). Exempted operations must comply with any applicable forest-practice rules. Copies of the applicable forest practice rules are available on request from the Department of Forestry's field offices.

The Department of Forestry employs specially trained forest-practice officers, who make inspections to determine if the timber operations are in conformance with all applicable forest-practice rules. Administration of the inspection system is based on a three-tiered priority system: a high risk of environmental damage, a medium risk, and a low risk. Each operation is assigned a priority based on such factors as topography, soil type, and the number and type of stream crossings to be used. Not all active operations are inspected each year. Eighty percent were inspected in 1973, 81 percent in 1974, and 69 percent in 1975 (Lyon, 1975). The use of preoperational inspections has been limited to high-priority operations; and even here, manpower shortages have resulted in considerably less than 100-percent coverage. Between five and ten percent of the Department of Forestry's inspections are conducted with personnel from the Departments of Environmental Quality, and Fish and Wildlife (Skill, 1976).

If the forest-practice officer discovers a violation, he may give the operator an oral warning with suggestions about how to correct the unsatisfactory condition, or he may issue a warning citation (Section 527.680). The landowner and the timber owner are sent copies of the citation and all subsequent citations and orders. Each citation issued must "specify the nature of the violation charged and any

damage or unsatisfactory condition that has occurred as the result of such violation" (Section 527.680 (1)). The operator may be ordered either to stop violating the rules, or, within a given period, "where practical and economically feasible, to make reasonable efforts to repair the damage or correct the unsatisfactory condition specified in the citation" (Section 527.680 (2b)).

If the operator does not stop the violation and damage continues to occur, a temporary order may be issued by the state forester forcing the operator to halt all activities in the affected part of the operation. The order remains in force until the violation ceases. An appeals hearing before the Board of Forestry Appeals Committee may be requested by the operator, landowner, or timber owner. The hearing must be held within 5 working days of the Appeals Committee's receipt of the request. After the hearing, the Appeals Committee has 5 working days to either affirm, revoke, or modify the order.

When the order to correct damages or unsatisfactory practices has not been followed within the specified period, the state forester must estimate the cost of correcting the problem and notify in writing the three concerned parties. Corrective measures by the state forester may begin immediately if one of the three agrees to pay the estimated cost. If approval is not obtained within 30 days, the state forester must present to the Board the alleged violation, his estimate of the correction costs, and the justification for the expenditure. With approval from the Board, the state forester may proceed, keeping an itemized account of all direct expenditures to be sent to the three

parties upon completion of the work. Expenditures may not exceed the authorized amount. They "constitute a general lien upon the real and personal property of the operator, timber owner, and landowner within the county in which the damage occurred" (Section 527.690 (4)). Foreclosure must be instituted within 6 months, or the liens cease. Any finding or order of the state forester affecting any of the three parties may be appealed to the Board's Appeals Committee (Section 527.700).

In the case of flagrant and continued violations, a criminal citation may be issued. Conviction for violating the forest-practice rules is a Class-A misdemeanor punishable by a maximum fine of \$1000 or 6 months in jail or both. A separate offense is counted for each day an operation is in violation of a temporary stop-work order (Morse, 1974).

3.4.6. Intent of the 1971 Law

Oregon's 1971 Forest Practices Act was passed very close to the peak of the environmental movement. Clearcutting had become a major national issue (Morse, 1974). The prevention of abuse by the poorer operators was a serious concern of the organized segment of the forest-products industry. The only available regulations for controlling this abuse were after-the-fact. These regulations, administered by the Departments of Environmental Quality, and Fish and Wildlife, allowed fines only after damage had occurred, i.e., changes in the physical or chemical attributes of the water that were detrimental to wildlife or aquatic life. For example, an operator could be fined for raising the temperature of a stream, but he could not be required to

leave sufficient riparian vegetation to prevent it from happening. This regulatory arrangement did not provide sufficient protection either to the environment or to the public image of the forest-products industry. To avoid regulations that would be stricter than the industry considered practical and economically bearable, the larger associations and companies worked hard to ensure the Act's passage (Manock, 1976).

The importance to the state of its forest resources and the industries dependent upon them was recognized by the Legislature in the Act's policy statement (Section 527.630). The forests make "a vital contribution to Oregon by providing jobs, products, tax base, and other social and economic benefits, by helping to maintain forest-tree species, soil, air, and water resources, and by providing a habitat for wildlife and aquatic life." Therefore it is the state's public policy "to encourage forest practices that maintain and enhance such benefits and such resources, and that recognize varying forest conditions" (Section 627.630 (1)).

The Legislature also recognized that operations on forest lands were already subject to laws and regulations, administered by the Departments of Environmental Quality, and Fish and Wildlife, that are concerned with the consequences of the operations rather than the way in which they were conducted. To ensure that forest operations are planned and conducted in conformance with such laws and regulations it is essential to avoid uncertainty and confusion in their implementation and enforcement.

To implement the state's forest policy and "to provide a mechanism for harmonizing and helping to implement and enforce laws and regulations relating to forest land," it is in the public interest to authorize the Board to develop and enforce regional forest practice rules. These rules must ensure "the continuous growing and harvesting of forest-tree species," the protection of "the soil, air, and water resources," and "coordination among state agencies which are concerned with the forest environment" (Section 527.630 (3)).

3.5. Washington: The Forest Practices Act, 1945 (Chapter 193)
and the Forest Practice Act, 1974 (Chapter 137)

3.5.1. Historical Background: 1945 The Forest Practices Act

The passage of Washington's Forest Practices Act in 1945 was the end result of the same political pressures and forest conditions that had shaped Oregon's 1941 Forest Conservation Act: the need for forest-fire-control, revision of the ad valorem property tax, and reforestation of harvested lands.

In the early 1900s, private associations of forest landowners were organized to detect and fight forest fires. The State Board of Forestry was first established to help organize forest-fire detection efforts. Later, when the State Division of Forestry was created, its responsibility was extended to other phases of forest-fire control as well (Greely, 1950).

About 1930, Washington passed a forest lands tax law, providing for nominal and fixed annual land tax, with a yield tax on the value timber harvested (Greely, 1950).

After the passage of the 1933 National Recovery Act (N.R.A.)

the lumbermen's associations wrote and adopted timber-cutting rules to ensure adequate reforestation after harvesting operations. A program of inspection and education of the operators was established by the associations to enforce compliance with the rules. When the N.R.A. was declared unconstitutional in 1935, the associations voted to continue the inspections and education as a voluntary program. The idea was to forestall federal intervention by ensuring that operators did a good reforestation job (Greely, 1950).

Not satisfied with the results of their voluntary program, the lumbermen and landowner associations had a draft bill written that incorporated the timber-cutting rules established under N.R.A. After several unsuccessful attempts, the associations persuaded the Legislature to pass the bill as the 1945 Forest Practices Act (Greely, 1950).

3.5.2. Description of the 1945 Law

3.5.2.1. Promulgation of rules and regulations. The basic reforestation regulations were written into the Act. In general, for clearcutting, the operator had to leave enough seed trees to provide adequate restocking; and for selection cutting, he had to leave an adequate reserve of commercial tree species to maintain continuous growth (Davis et al., 1956).

The act divided the state into two regions: the east side and the west side of the Cascade Mountains, with separate rules for each. On the east side, minimum diameter limits and a minimum number of seed trees per acre were set for old-growth ponderosa pine. For young growth being thinned or cut for improvement, one-half of the trees

between 12 and 18 inches in diameter at breast height (d.b.h.) had to be left. Five percent of each acre of lodgepole had to be left uncut. On the west side, the requirement was that in every 160-acre block, 8 acres were to be left well stocked with commercial conifers at least 16 inches d.b.h. (Davis et al., 1956).

3.5.2.2. Administration, enforcement, and exemptions. The administration of the Act was placed in the state's Division of Forestry, under the state supervisor of forestry. Every commercial timber operator was required to submit a written application for an operating permit before commencing a logging job. All operations were to be inspected by Division personnel, to check for compliance with the seed-tree requirements (Davis et al., 1956).

When he discovered a violation, the state supervisor of forestry could shut down the operation until he had assurance that the operator would conform. The supervisor could require bond of no more than \$8 per acre in violation before allowing the operator to continue. For flagrant and continued violations, he could suspend an operator's permit and not renew it for any part of the state until the operator agreed to comply. After 2 years, if natural restocking had failed on an area cut in violation, the state supervisor of forestry could use the bond for planting the area (Merrill, 1945). Operating without a permit was a misdemeanor (Davis et al., 1956).

Exemption upon written application to the state supervisor of forestry was available for (1) thinning and sanitation cutting; (2) conversion of the land to agricultural, mining, or residential use;

and (3) clearing landings, campsites, firebreaks, and rights-of-way (Davis et al., 1956).

3.5.2.3. Amendments to the Act. The Act was amended in 1947 (Chapter 218). The restocking period of grace was lengthened to 5 years, and the bond requirement was raised to \$16 per acre. The title, state supervisor of forestry, was changed to state forester. Alternative plans for restocking could be followed if approved by the state forester. In 1953, amendments (Chapter 44) made provision for the landowner to apply for a harvesting permit or to cosign the operator's application, thereby sharing the responsibility with the operator for compliance with the Act. If the landowner did not cosign the application, the operator was required to post a bond before beginning operations to ensure compliance (Davis et al., 1956).

3.5.3. Intent of the 1945 Law

The policy stated in the Act was to conserve and perpetuate the state's forest resources by keeping timberlands continuously and fully productive. To accomplish this policy, the regulations in the Act were designed to provide continuous growth of commercial tree species on lands suitable therefore, by requiring practices that would ensure restocking of harvested lands within a reasonable time.

As with all the forest-practices acts studied, Washington's Act was passed at a time when the threat of a serious timber shortage was thought by many to be imminent. The federal Forest Service and some congressmen had been attempting to get federal forest practices legislation. The organized segment of the forest industry and forest landowners did not want the federal government involved in their affairs. Hence they supported state legislation.

3.5.4. Historical Background: 1974 Forest Practice Act

In the late 1960s, the Department of Natural Resources (DNR) recognized that either the federal government or the local governments were going to regulate forest practices if nothing was done at the state level. In 1969, the DNR began consultations with the Legislature on the desirability of a new forest-practices act to forestall both federal and local action (Hawely, 1976; Stolaas, 1976).

The DNR also began talks with forest-industry lobbyists, and in particular the Washington Forest Protective Association, to determine their position. Although they agreed with the DNR concerning the need for a new act, the interest groups wanted to concentrate their efforts a state at a time, working first to secure passage of a new forest practices act in Oregon. This position proved unfortunate for the forest industry when their first draft of a new act for Washington was finally ready, in 1972. Environmentalists had made significant gains in the Legislature; they defeated industry's bill when it was introduced into the Legislature (Hawely, 1976; Stolaas, 1976).

The Committee on Natural Resources introduced a new draft act, House Bill 637 (H.B. 637), to the Legislature in January 1973, and immediately the Legislature referred it back to the Committee for revision. Twice more, the bill was reintroduced and sent back. Major revisions were made each time, primarily to strengthen environmental controls. Introduced for the third time in the fall of 1973 as Substitute H.B. 637, the bill overwhelmingly passed the Legislature, and was signed by the governor on February 14, 1974 (Washington Forest Practice Board, 1976).

The first efforts to draft forest practice regulations were made in early 1973, while debate over a bill still raged in the Legislature. The counties worked on forest-practice regulations required by the state's 1971 Shoreline Management Act. Then in July, the commissioner of Public Lands appointed a Forest Practices Ad Hoc Committee, whose task was to develop a draft of rules for consideration by the state's Forest Practice Board in the event a new act was passed. Alternately, the draft could be used as a set of interim guidelines for managing state forest land and for making recommendations to private landowners (Washington Forest Practice Board, 1976).

Two subcommittees were formed to help the Ad Hoc Committee. One, of five members, was to draft natural-resource policies. The other, of eleven members, was to draft rules. The subcommittee on rules used the "Field Guide to Oregon Forest Practice Rules" as a basis for discussion. The output of the Ad Hoc Committee was turned over to the newly formed Forest Practices Advisory Committee after the passage of the 1974 Forest Practice Act.

3.5.5. Description of the 1974 Law

3.5.5.1. Forest Practices Advisory Committee (Section 20). The Forest Practices Advisory Committee (FPAC) has 11 members. The governor, with the Forest Practice Board's approval, designates an appointee from (1) the College of Forest Resources, University of Washington; (2) the Department of Forest and Range Management, College of Agriculture, Washington State University; (3) the Washington soil and water conservation districts; (4) the Department of Fisheries; and (5) the Department

of Game. For staggered 3-year terms, he also designates, (6) three forest-land owners who regularly engage in timber operations, to represent the east and west regions and the owners of large and small holdings; and (7) three public members who have no direct financial interest in forest land.

The primary duty of the FPAC is to draft forest practices regulations for review by the Forest Practice Board. So far as practicable, the regulations are to apply statewide. However, the FPAC is required to establish two to five regions -- based on timber type, soil, and climate -- for the administration of regulations applicable only on a regional level. The Committee decided to use two regions: the east side and west side of the Cascades Mountains. A nine-member subcommittee, four of whom must be forest landowners regularly engaged in forest practices, was established for each region to assist in drafting regional regulations.

Nothing in the Act prevents any person from proposing regulations for consideration by the Forest Practices Board.

3.5.5.2. State Forest Practices Board (Sections 3, 4, and 5). Before the Act was amended in 1975, the Forest Practices Board was composed of nine members. The five ex officio members are (1) the commissioner of Public Lands; (2) the commissioner of the Department of Commerce and Economic Development; (3) the director of the Department of Agriculture; (4) the director of the Department of Ecology; and (5) an elected member of a county legislative authority appointed by the governor. The governor appoints the other four members from the general public for staggered 4-year terms.

The Board's duty is to promulgate forest practice regulations establishing minimum standards for forest operations. Forest practice regulations related to water quality are promulgated separately by the Board and the Department of Ecology (DOE). Before any regulations are adopted, copies are sent for review and comment, to the Departments of Fisheries and Game and to the counties. Counties may propose specific regulations to control local problems. At least one public hearing must be held before final regulations are issued.

Again before the 1975 amendment, the Act directed the Forest Practices Board to divide forest practices into three classes on the basis of the area covered by the operation, the volume of timber removed, topography, proximity to streams, and the risk of damage to "public resources," defined in the Act as "water, fish, and wildlife . . . and capital improvements of the state or its political subdivisions" (Section 2. (10)). Class-I forest practices were defined as having no direct potential for damaging public resources. No application was required to carry out practices, although a 2-day notification was required for some. Class-II practices required submission of an application to the DNR, which had 14 days to approve or disapprove. Class-III practices required the same application, but the DNR had 30 days to act on it. The interim regulations issued by the DNR in January 1975 placed almost all forest practices in Class-III (Cornelius, 1976).

3.5.5.3. Appeals Board (Sections 21 and 22). The governor, with the advice and consent of the Senate, appoints a three-member board to

hear all appeals from any DNR enforcement action or determination with respect to the Act. All members must be qualified by training and experience in environmental fields, and at least one must be a practicing lawyer.

3.5.5.4. Role of the Department of Ecology (Sections 10, 16, 17, 26, and 30). The Department of Ecology establishes the state's water-quality standards under the 1971 Environmental Policy Act. Forest practice regulations promulgated by the Forest Practices Board and the DOE must be designed to achieve compliance with these standards. Water-quality monitoring of forest operations must be performed by the DOE to determine the need for revision of the standards or the regulations.

To ensure compliance with water-quality-related forest regulations, the DOE conducts inspections while the operation is in progress. When DOE discovers a violation that the DNR has not acted on, they must first notify the DNR of the problem. Before the 1975 amendments, if the DNR did not act, the DOE was allowed to take appropriate action (see 3.5.5.8.). Appeals from DOE orders or determinations were handled by the pollution control hearing board. No civil or criminal penalties could be imposed if the violation was in conformance with an approval or directive from the DNR.

3.5.5.5. Role of the counties (Sections 5 and 24). The counties cannot regulate forest practices directly. However, they can regulate forest practices through (1) land-use planning or zoning if the forest land is being converted to another use or was platted after January 1, 1960; (2) their taxing powers; (3) regulations related to public health; and

(4) authority to establish master programs granted under the 1971 Shoreline Management Act. Any regulations promulgated under these powers must be consistent with the forest practice regulations and may not unreasonably affect timber harvesting.

Counties receive from the DNR, within 2 days of their submission, copies of all forest-practice applications within their jurisdiction. If a county believes an application is inconsistent with the Forest Practice Act or the county's authorities, it notifies the DNR and the applicant of its objections. The DNR must receive the objections within 7 days for Class-II practices and 14 days for Class-III or 1 day before the DNR acts on the application, whichever is later. The 1975 amendments allow the county 14 days (or 1 day before DNR action) to respond to all applications. If the application relates to forest lands being converted, or platted after January 1, 1960, the DNR cannot approve those portions of the application that the county objects to. The contested portions can be disapproved by the DNR or brought before the Appeals Board for determination.

The DNR must notify the counties within 4 business days, after receiving a notification, and approving or disapproving an application within the counties' jurisdictions. A county may appeal to the Appeals Board the DNR's approval of any application.

3.5.5.6. Applications (Section 6). The Forest Practice Act specifies that an application must contain (1) the name and address of the operator, timber owner, and landowner; (2) a legal description of the land; (3) a description of the forest practices to be undertaken and the type of equipment used or chemical that will be applied; (4) maps

showing the location and area of all public waters on and immediately adjacent to the logging chance and all existing and proposed roads and tractor trails; (5) the reforestation plan and, if required by the forest-practice regulations, a plan to revegetate roads and landings to reduce their erosion potential; (6) data on the hydrology, geology, and soils that will be affected by the forest operation; (7) provisions for continued maintenance of roads and other construction to protect public resources; and (8) the expected dates of commencing and completing the operation. When the operating period is longer than 1 year, an application for renewal must be filed.

Any number of logging jobs within a reasonable management area can be covered by a single application. The DNR provides assistance to landowners and timber owners in devising long-range plans.

An application must state whether the land is being converted to another use within 3 years. The reforestation requirements are waived for these lands. Conversion operations are subject to all applicable regional, county, and city regulations. Landowners must sign the application or if the operator submitted the application, he must send an additional statement indicating he will convert the land and is familiar with the laws affecting his action.

The DNR can ask that it be notified 5 days before an approved operation commences. This allows the DNR a better opportunity to inspect operations that have a high potential for damaging public resources.

3.5.5.7. Reforestation (Section 7). Reforestation must be accomplished

within 3 years of an operation's completion. Up to 5 years are allowed if an approved natural-regeneration plan is followed. A reforestation report is filed with the DNR after reforestation is complete. Within 6 months (now 12 months), the DNR inspects the land to determine if the reforestation is in compliance with the forest-practice regulations. If it is not, the landowner may be ordered to correct the violation by supplemental planting.

3.5.5.8. Administration, enforcement and penalties (Sections 8, 9, 12, 13, 14, 17 and 19). The DNR makes inspections before, during, and after operations to determine if the operator is complying with the forest-practice regulations. When it discovers a violation, the DNR has three options for securing compliance: (1) an informal conference; (2) a notice to comply; or (3) a stop-work order.

1. When there is no immediate threat to public resources, a noncomplying operator must be given an opportunity for an informal conference with the DNR concerning proposed enforcement action. Written notes are taken by DNR personnel and kept on file for 1 year. The operator, timber owner, and landowner are sent copies of the notes (Washington Forest Practices Board, 1976).

2. A notice to comply is issued when (a) a public resource is being damaged or threatened, (b) a violation of the forest practice regulations has occurred, or (c) there has been a substantial deviation from the approved plan. The notice informs the operator of the reason for the notice, the relevant forest practice regulations and what must be done to achieve compliance. Copies of the notice are sent to the landowner and the timber owner. Any of the three may request a hearing

with the DNR within 15 days. The hearing must be held within 20 days of the request, and a decision reached within 10 days after the hearing. Any appeal from DNR's determination must be taken to the Appeals Board within 30 days. All notices and determinations must be complied with immediately unless appealed.

When an operator refuses to comply with a notice or determination, the DNR estimates the cost of correcting the violation or damage and notifies the three parties. One of the three must take corrective action within 30 days and complete the work within a reasonable time. The DNR does the work if the work is not started and completed by the three parties. All three are jointly liable for all direct costs incurred by the DNR up to the original estimate. Payment is due within 60 days or the cost becomes a lien on the property.

3. Stop-work orders are issued to operators for (a) flagrant violation of the regulations, (b) substantial deviation from an approved plan, or (c) not stopping or preventing extensive damage to public resources. The order contains the same information as a notice to comply, plus an order to halt all operations related to the violation, deviation, or damage. Copies are sent to the timber owner, the landowner and the Appeals Board. The three parties have 15 days to bring action before the Appeals Board. A hearing must be held within 20 days. Although the operator must comply immediately when served with a stop-work order, the Appeals Board may stay all or part of the order on conditions it specifies, pending the completion of hearings.

The DNR will take immediate corrective action to stop or prevent extensive damage to public resources if a stop-work order is ignored.

If liability is fixed with the landowner, timberowner, or operator, the costs of such action are recovered in the manner previously described.

Action to enforce final orders or determinations is undertaken for the DNR by the attorney general's office. Failure to comply with a final order or determination may result in the violator being enjoined from operating for 1 year. Before the 1975 amendments there was a maximum \$1,000 fine for violating a forest-practice regulation. Each violation of a regulation and each day a violation continues is a separate offense. Fines are appealed first to the DNR and then to Appeals Board. An appeal must be filed within 30 days after notification of the fine is received.

3.5.6. Intent of the 1974 Law (Section 1)

The Legislature recognized that the forest resources of the state are one of its most valuable resources. The state's economy depends upon a strong, viable forest industry. This dependence creates a public interest in sound natural-resource policies for private as well as public commercial-forest lands. Coordinate with the need for a strong forest industry is the need to protect forest soils, air quality, public resources, recreational opportunities, and scenic beauty.

The Legislature decided that the public interest would be served best by a comprehensive system of forest-practice regulations administered by the state. The system is designed to achieve specified policies and purposes: (1) Timber growth is to be promoted and protected, and after harvesting, the minimum reforestation that reasonably

utilizes the site's productivity is to be required; (2) All reasonable methods will be used to protect public resources and forest soils. (3) It will be recognized that public and private interests are involved in profitably growing and harvesting forest products. (4) Timber operators will be permitted the maximum freedom and efficiency that is consistent with the other policies and purposes. (5) The state will avoid wasteful duplication in regulating forest practices. (6) The state will seek input from all agencies concerned with forest lands and will coordinate its efforts with those of its political subdivisions. (7) Forest-practice regulations will be promulgated to achieve compliance with state and federal nonpoint-source water-pollution regulations. (8) The state will accommodate reasonable land-use planning efforts by local governments through zoning and other measures.

3.5.7. Subsequent Developments

3.5.7.1. Regulatory action. During May 1974, the Forest Practices Advisory Committee (FPAC) held 17 informal public hearings to provide the public an opportunity to propose regulations. The attendance was light, with the majority seeking to get information about regulations rather than to propose regulations. The small operators expressed fear of being regulated out of business. Owners of small holdings protested financial problems and loss of property rights (Washington Forest Practices Board, 1976).

The DOE published its first draft of water-quality-related forest regulations on June 13, 1974. The draft was reviewed and re-

vised internally, becoming draft No. 2. On June 20-21, the DOE sponsored a workshop to give forest-practice experts an opportunity to comment on draft No. 2. Local government officials and environmental groups were invited to comment on the draft at a second workshop held on July 7. Draft No. 2 was revised and expanded on the basis of the input from the workshops, to become draft No. 3 (Washington Forest Practices Board, 1976).

Throughout June 1974, the regional subcommittees of the FPAC worked to draft forest-practices regulations for their regions. Both subcommittees leaned upon a "discussion draft" published by the Washington Forest Protective Association, an organization of individuals and companies who own forest land.

Their draft regulations were presented to the FPAC on July 2. At a July 9 meeting, the FPAC reviewed the work of the subcommittees, the Forest Protective Association's "discussion draft," the Ad Hoc Committee's 1973 draft regulations, and the DOE's draft No. 2. The Committee chose the "discussion draft" as a working model for writing further regulations. It completed its first draft of the regulations on July 18, and a second draft on July 25. On July 26, the DOE presented to the FPAC, for information, their draft No. 3 of the water-quality-related forest practice regulations. After this meeting with FPAC, the DOE produced draft No. 4 (Washington Forest Practices Board, 1976).

The Forest Practices Board met on August 2, 1974, to discuss the FPAC's second draft and the DOE's draft No. 4. During August, the Board considered the question of aesthetic values related to forest

practices. At the request of the Board, the attorney general's office issued a memorandum to avoid the confusion that was rampant in California (Cornelius, 1976). The memorandum stated that the Forest Practices Act did not explicitly authorize regulations to protect scenic beauty, nor did it implicitly authorize such regulations, either. The requirement to regulate for the protection of public resources implies no such authority, he commented, since scenic beauty is not included in the definition of public resources (see 3.5.5.2) (Washington Forest Practices Board, 1976). Not all Board members were in agreement with the memorandum's interpretation (Dyer, 1976; Knibb, 1976).

The Board completed a single set of forest-practice regulations on September 13, 1974. This was published as "Discussion Draft No. 4, Washington Forest Practice Regulations," and was distributed to all counties and the Departments of Game and Fisheries for comment on September 30.

Throughout October, the Board met to discuss the comments received. The counties that responded were split in their opinions: Eleven thought the regulations too strong, either too weak; three were undecided, and one was split (Washington Forest Practices Board, 1976). Discussion Draft No. 4 is considered the highwater mark of the environmentalists' efforts to control forest practices (Cornelius, 1976).

In November 1974, the Department of Commerce and Economic Development issued "Proposed Washington Forest Practices, An Economic Cost Analysis," based on Discussion Draft No. 4. The Department's con-

clusion was that total harvesting costs -- i.e., unit costs of felling and bucking, yarding and loading, and road construction and maintenance, and revenues forgone in leaving buffer strips along streams -- would be increased by 20 to 40 percent.

Discussion Draft No. 4 quickly became Draft No. 5 as it was reviewed internally by the Board. The Board completed Draft No. 6 on December 17, 1974, for use early in 1975 at public hearings and for redrafting the just completed environmental-impact statement on the proposed regulations. The DNR on December 31, 1974, issued emergency interim regulations similar to those in Draft No. 6, for use in 1975 until the Board could produce final regulations (Washington Forest Practices Board, 1976).

In January 1975, the Forest Practices Board sponsored two public meetings to inform the public about Draft No. 6. The small, independent loggers, backed by the larger companies, expressed the fear that the strict regulations would drive them out of business. On the other hand, the regulations did not provide enough protection to water quality and other public resources to suit the environmentalists (Washington Forest Practices Board, 1976).

Formal public hearings were held by the DNR during February 1975, to discuss the emergency interim regulations. Major changes were made and permanent interim regulations promulgated March 30 (Washington Forest Practice Board, 1976).

3.5.7.2. Political action. Beginning in January 1975, legislators began introducing bills to repeal or substantially modify the 1974

Forest Practices Act in response to pressures from various segments of the forest industry. The larger companies supported amending the Act rather than repealing it (Cornelius, 1976). The bills were so hotly debated and divergent that the Senat and House could not reach an agreement. Loggers marched on Olympia to express their extreme dissatisfaction with both the present Act and the DNR's interim regulations. A joint conference committee was formed to work out differences. After much debate between environmentalists and forest industry supporters a bill satisfactory to both was drafted by the conference committee (Substitute H.B. 1078) and overwhelmingly passed by both the House and the Senate. The governor signed the bill on June 6, 1975.

3.5.8. Major Amendments to the Act

In the 1975 amendment, Section 3 of the 1974 Act, creating the Forest Practices Board, was changed. Public membership was increased to six by the addition of a forest landowner holding less than 500 acres and an independent contract logger.

A new four-way forest practice classification system was created by amending Section 5. Class-I practices continued to comprise those with no direct threat to public resources, but the notification requirement was dropped. Class II was changed to include practices with a minimal threat to public resources. A 5-day notification was substituted for the application requirement. Class III was defined as all forest practices not in Classes I, II, or IV. The DNR was given 14 calendar days rather than 30 to approve or disapprove the application. Class IV consisted of forest practices on (1) lands platted

after January 1, 1960; (2) lands not being reforested because of present conversion plans or possible future urban development; and (3) lands where forest practices pose a substantial threat to public resources. The DNR was given 10 days from receipt of a Class-IV application to determine if a detailed environmental statement would be required in accordance with the 1971 Environmental Policy Act. If a statement was not to be required, the DNR had 30 days to act on the application, or 60 days if a statement was to be required. All Class I, II, and III forest practices were exempted from the environmental statement requirement.

Sections 8 and 9 of the 1974 Act were amended to authorize the DNR to issue notices to comply and stop-work orders specifying a course of action to stop or prevent damage to public resources. Such authority for the DNR was to cover cases where damage would be caused by forest practices that were in conformance with regulations and an approved application. A 1-year liability period was written into Section 9 for damages occurring after completion of an operation, except that the landowner's road-maintenance responsibilities would continue indefinitely for all but abandoned roads.

Amendments to Section 10 removed the DOE's power to issue notices to comply and stop-work orders. Notice of a violation is given to the DNR as before, but the DNR now has to act within 24 hours. If it does not, the DOE petitions the chairman of the Appeals Board. Within 48 hours, he must direct the DNR to take appropriate action or deny the petition.

Section 17 was amended, lowering the maximum fine to \$500.

The authority granted to the counties to regulate forest practices under the 1971 Shoreline Management Act (Section 24) was limited to "shorelines" -- i.e., 200 feet from the highwater mark of all bodies of water and wetlands, except for streams and stream segments where the flow is less than 20 acres, and their associated wetlands. The forest practice regulations were made the sole criteria for judging the acceptability of forest practices. No county permit could be required for a single road or road segment of less than 500 feet that enters the shoreline only once and does not cross the water. All other county regulations adopted in the master programs are left unaffected.

3.5.9. Subsequent Developments

Following passage of S.H.B. 1078, the Forest Practices Board requested the RPAC to make changes in Draft No. 6 to conform with the amended Act. The DNR promulgated new emergency regulations for the same reason on July 22, 1975. After working all summer, the FPAC and the DNR completed a discussion paper designated Draft No. 7. The Board reviewed it on September 25. After minor revisions, it was published in October as Draft No. 8 (Washington Forest Practice Board, 1976).

In November, 1975, the Board reviewed the second draft environmental-impact statement for the proposed forest practice regulations. The interim forest practice regulations were revised by the DNR to bring them into line with the work of the Board, and then they were promulgated (Corneliu, 1976). The Board continued its work on the regulations.

Draft No. 9 of the regulations and the third draft of the environmental-impact statement were released to the public in March 1976. Six public hearings were held during April (Cornelius, 1976).

The FPAC considered the public comments and made recommendations that were included with Draft No. 9 and designated Draft No. 10. After making some minor revisions, the Board adopted Draft No. 10 (Cornelius, 1976). The "Interagency Memorandum of Understanding Concerning Forest Practices" was completed and signed on May 17, 1976, by the DNR, the DOE, and the Departments of Fisheries and Game. This memorandum created a system whereunder a single agency, the DNR, makes all contacts with timber operators, to take care of all enforcement activities at one time. The circumstances were described under which the other three agencies were to be requested by the DNR to review an application. Formal training sessions were mandated for DNR field personnel, to acquaint them with the work they would be doing for the Departments of Fisheries and Game.

Following public hearings, the Board promulgated the forest practice regulations and approved the environmental-impact statement (Cornelius, 1976). The regulations were published in booklet form and released July 16, 1976. The final environmental-impact statement was also released in July.

4. ANALYSIS OF COSTS AND BENEFITS

4.1. New York

4.1.1. Costs

4.1.1.1. Administration and enforcement. Following passage of the 1946 Forest Practice Act, the Conservation Department, already employing 13 district foresters, hired 8 assistant foresters and 2 additional district foresters, making a total of 23 foresters assigned to administer the Act. In the first year, over 1,000 commercial forest landowners were enrolled under the Act (Howard, 1947). By 1952, the number of owners enrolled had risen to 5,000, representing more than a million acres of forest land. In 1968, 9,500 owners, representing 1.8 million acres, were enrolled (Ferguson and Mayer, 1970). At present the Division of Lands and Forests is helping the owners of more than 2 million acres to manage their lands for commercial wood production. The field staff now has about 60 foresters to provide advice and assistance (Decker, 1976).

Related to the Forest Practice Act is the new Forest Tax Law (Section 48A, Real Property Tax Law, 1974). Enrollment under this law requires (1) a minimum of 50 acres; (2) the minimum stocking level that will produce commercial forest products within 30 years; (3) an annual commitment by the owner to manage his land for 10 years to produce forest products under a management plan approved by the Department of Environmental Conservation; (4) a 6-percent tax on the value of any stumpage harvested; and (5) a heavy penalty for converting the land to another use (Demeree, 1977). The new tax law undoubtedly will increase enrollment under the Forest Practice Act as owners

seek aid in preparing the necessary management plans (Demeree, 1976).

The identification and control of nonpoint-source water pollution required under Section 208, PL-92-500 has just begun. Water-quality monitoring programs are being established, but not for a direct assessment of the impacts of the forest-practice standards on water quality. This seems logical, because the average soil loss from woodlands in New York is 0.43 tons per acre per year, less than half the loss from other land uses (U. S. Department of Agriculture, Soil Conservation Service, 1975). Given New York's financial situation, it is extremely doubtful that an accurate assessment of the present forest-practice standards will be undertaken or that an environmentally oriented forest-practice act will be passed in the near future (Male, 1976).

4.1.1.2. Compliance. Compliance with the Forest Practice Act costs no more than following free advice on how best to manage forest land to obtain the highest returns from wood production.

4.1.2. Benefits

4.1.2.1. To the public. From 1950 to 1968, New York's commercial forest-land area increased by 14 percent, bringing it to 47 percent of all land. This increase was due primarily to farm abandonment. Private owners of small tracts hold 59 percent of the commercial forest land; farmers, 26 percent; forest industry, 92 percent; and state and local governments, 6 percent.

The intent of the Forest Practice Act is to improve forest conditions for wood production. However, during the period 1950 to

1968, the area of understocked stands increased, and timber quality declined (Ferguson and Mayer, 1970). It appears that the state's efforts under the act, underfunded as they were and hampered by meager public knowledge, were overbalanced by the inpouring of poorly stocked abandoned farmlands into the forest category. This situation is unlikely to change significantly. While the owners of 78 percent of the commercial forest land have some interest in wood production, only 20 percent of the land is held primarily for that purpose (Ferguson and Mayer, 1970).

4.1.2.2. To the industry.

The Act's intent is to increase the quality of forest management practiced on private lands. To a large degree, this has been achieved on lands enrolled under the Act, thereby helping to ensure an adequate wood supply for forest industry. Indications are that the state's forest-based industry is stabilizing at a level well within the bounds of its potential resource requirements. About 5 percent of the state's work force is employed by forest-based industries (Bones and Mayer, 1967). Whether the industry's stability is a direct result of the Forest Practice Act is an unanswerable question.

4.2. Massachusetts

4.2.1. Costs

4.2.1.1. Administration and enforcement. In 1944, the Division of Forests and Parks hired one man to administer the 1943 Cutting Practices Act and to supervise the work of two newly hired field inspectors. A few years later, the number of inspectors was increased to four. The inspectors visited about six logging operations a day and completed the attendant paper work (Lambert, 1976).

Considering the severe manpower limitations imposed by inadequate funding, the Act was adequately administered from 1944 until 1960. After 1960, the manpower limitations resulted in considerably less than 100-percent coverage. Much of the manpower problem, particularly after 1958, can be attributed to the inactivity of the State Forestry Committee: The Committee carried out its oversight responsibilities actively until 1958, when a person with no forestry background was elected chairman (Lambert, 1976); from June 17, 1958, to November 17, 1967, the Committee held no meetings.

When the Committee met in 1969, it decided practically to eliminate enforcement of the Cutting Practices Act. Priority was given to (1) helping landowners to develop the management plans required under the recently amended Classification and Taxation of Forest Lands and Forest Products Act (Chapter 61, as amended by Chapter 873, 1969); (2) helping county assessors to evaluate land and stumpage for the forest land and products tax; and (3) planning and inventorying state and local public forest lands (Lambert, 1976).

The requirements for certification under Chapter 61, as amended, are (1) a parcel of 10 acres or more with a total land and stumpage value of less than \$400 per acre; (2) a Certification of Management, stating that the land is being managed for commercial forest production, approved every 5 years by the state forester; (3) a maximum ad valorem assessment of \$10 per acre and an 8 percent yield tax on the value of stumpage harvested; and (4) a heavy penalty for conversion to other uses.

There are only about 200 timber operators in the state, and only a few are still notifying the Division of their intent to cut or obtain

the required operator's license. The notification and license requirements are enforced only when the logging operation is on state lands. It is extremely doubtful that enforcement of the Cutting Practices Act will be given a higher priority in the future (Gullion, 1976).

The state is just beginning the initial monitoring phase for its 208 planning and control program. As a consequence, the officials are not much beyond point-source pollution identification. Monitoring is being concentrated around urban-industrial areas where water pollution problems are most severe. Lack of funding is preventing any direct assessment of the impact of forest operations on water quality (Holmes, 1976).

4.2.1.2. Compliance. Compliance with Cutting Practices Act is essentially costless for the operator. The required cutting plan is drawn up, and seed trees marked, free of charge by Division foresters. Although the value of timber lost in seed trees could be considerable, in most cases operators have been allowed to use the poorest trees that would meet the requirements (Lambert, 1976).

4.2.2. Benefits

4.2.2.1. To the public. From 1953 to 1972, the area of commercial forest land in Massachusetts declined approximately 11 percent, primarily because of conversion to urban uses. Commercial forest land now covers 58 percent of the state's total area, with 86 percent held by small-scale private owners, 13 percent by state and local governments, 9 percent by farmers, and 1 percent by forest industry (Kingsley, 1974).

The intent of the Act is to improve forest conditions for wood production. During the period 1953 to 1972, timber volume rose, but much of the growth was of poor quality. The logging that would be controlled by the Act accounts for only 15 percent of the total volume removed. The other 85 percent is cut to convert the land to urban uses. Of this, 56 percent is burned or buried because the timber is not suited for sawlogs and there are only a few small pulpwood markets, all out-of-state. Little improvement is probable because 58 percent of the owners hold forest land as part of their residence for its amenity value; only 2 percent own the land primarily for wood production; and another 8 percent have wood production as an important secondary reason for ownership. Compounding this lack of interest in timber is the rapid ownership turnover: only 5 percent of the private commercial forest land has been in the same family for more than 50 years (Kingsley, 1974).

4.2.2.2. To the industry. During the active administration of the Cutting Practices Act, forest industry benefited from the free advice and planning services provided by the state. At present, forest landowners gain from what little aid the state has to give. Forest industry benefits indirectly from the increase in the supply of their raw materials. However, the industry is so small and the markets are so poor, that it cannot begin to take advantage of the forest resource that already exists (Gullion, 1976).

4.3. California

4.3.1. Costs

4.3.1.1. Administration and enforcement. The cost to the taxpayers of California for administering and enforcing the 1973 Forest Practice Act was \$1,856,953 for fiscal 1974-1975, \$2,068,068 for fiscal 1975-1976, and \$2,119,623 for fiscal 1976-1977. In fiscal year 1974-1975, the administration and enforcement costs were between 70 and 85 cents per thousand board feet. Douglas-fir sawmill log prices in 1974 averaged \$180.50 per thousand board feet, and in 1975 averaged \$168.70 (Ruderman, 1976).

This cost breaks down into two major categories (1) timber harvesting plan (T.H.P.) review and (2) three or four on-site inspections for each operation. In 1974, 2463 T.H.P.s were filed; 2152 were filed in 1975, of which 2028 were approved. The forest-practices inspectors conducted 3326 inspections in 1974, 5668 in 1975. Given the rapid changes that the forest-practice rules were undergoing, compliance by the timber operators has been high. The compliance index (the number of rules complied with divided by the sum of the number of rules violated plus the number complied with) was 0.94 for 1974 and 0.96 for 1975 (California Board of Forestry, 1975).

Beginning in 1978, the 5-year final stocking inspections will have to be made on lands harvested in 1973-74.

Monitoring programs to judge the effectiveness of the Board's erosion-control and stream-protection rules are an additional cost to the state. A long-term study now being implemented has received a \$100,000 appropriation for fiscal 1976-1977.

For fiscal 1974-1975, then Governor Reagan requested the Board of Forestry to divide fairly the costs of the program between forest industry and the taxpayer. The Board refused to increase the timber operator's permit (T.O.P.) fee, stating that (1) the law required it to establish a reasonable filing fee (Section 4572) and (2) use of the fees as a cost-sharing device was inappropriate because operators were required to incur substantial costs in the public interest. Concurrence with the board's position came from the Legislature, which appropriated the required money from the general fund (Callaghan, 1975).

The next year, newly-elected Governor Brown proposed that the entire 1975-76 forest-practices budget be financed by increased T.O.P. fees. Again the Board refused to increase the fees, and the legislature appropriated the entire amount of the shortage. Governor Brown later reduced the Legislature's appropriation for the last half of fiscal 1975-1976 by \$250,000, approximately 25 percent. Forest industries would make up the difference through increased fees. The fees were not increased, forcing the Legislature to pass an additional appropriation to cover the short-fall. For fiscal 1976-1977, the Governor proposed that forest industry pay \$500,000, approximately 25 percent of the program costs. The proposal was rejected by the Legislature, which instead appropriated the entire amount.

4.3.1.2. Compliance. California's forest industries have experienced substantial cost increases in complying with the Forest Practice Act. A partial survey of the California Forest Protective Association membership in 1974-1975 revealed an average increase of \$4.76 per

thousand board feet. The increase was largest in the Coast District--\$8.15 per thousand board feet, and about equal in the other two districts--\$3.18 per thousand. Based on the 1974 harvest from private and state lands of 2.5 billion board feet, the cost would have exceeded \$14,000,000 (Callaghan, 1974). The total value of the harvest was approximately \$451,250,000, therefore the costs of compliance represent about 2.6 percent of the harvest's value. Although highly variable, the cost increases, in descending order, were for skidding and yarding, road construction and maintenance, stream protection, erosion control, and T.H.P. preparation (Callaghan, 1976).

Skidding-cost increases are related primarily to skidding time: protection of residual trees from skidder damage requires slower operating speeds. Minimizing the number and length of the skid trails results in a longer layout time. Cable yarders are no longer allowed to use residual trees for rigging cables without protective devices, and they must avoid damaging stream banks and streamside vegetation.

Higher costs for road construction and maintenance result from (1) increased layout time; (2) slope restrictions that make the roads longer; (3) greater use of permanent and semi-permanent stream-crossing structures, erosion-control devices and water breaks; and (4) increased end-hauling or erosion-control treatment of side-cast material.

Stream protection relates directly to the Stream or Lake Protection Zone. This zone varies in width from 50 to 150 feet measured along the ground from the stream transition line (the point closest to the stream where riparian vegetation is permanently established). The variation depends upon the soil's erosion potential, the type and amount of

stabilizing riparian vegetation, and the topography. Debris and slash in the zone must be removed during operations as quickly as possible. Up to 50 percent of the shade-producing riparian vegetation and trees must be left and protected during operations for stream-temperature control. Tractors are prohibited from operating within 50 feet of the stream transition line except at stream crossings.

The cost of preparing a T.H.P. ranges from \$500 to \$2000 (Passof, 1976). This front-end cost and the time necessary to get the T.H.P. approved has worked a hardship on the small-tract owners. Many now prefer to cut as much timber as possible and be done with it, because they have to harvest their timber when contract loggers are available (Ehlers, 1976).

An additional item is the cost of complying with the restocking standards. Replanting may have to be done as many as three times. When natural regeneration is used but does not produce adequate results within 2 years of the operation's completion, planting is required.

4.3.2. Benefits

4.3.2.1. To the public. Forests cover 42 percent of California's land surface, but only 17 percent of the land surface is classified as commercial forest land. National forests contain 50.2 percent of the commercial forest land; other public holdings contain 3.1 percent, and private owners control 46.7 percent (Oswald, 1970). Of the private forest, 58 percent is held by 40 owners for industrial wood production, and the rest by 50,000 to 80,000 farm and other nonindustrial owners (Callaghan, 1973). Forest industry provides an extremely important benefit to regional economies. It is a major

employer along the northern coast and down the length of the Sierra Nevadas. Statewide, however, this benefit is not as great. The industry accounts for only 1.13 percent of the total nonagricultural employment and 5.24 percent of the manufacturing employment (U. S. Bureau of Labor Statistics, 1975).

The protection of water quality and aquatic life is the principal public benefit derived from the strict rules governing road construction and maintenance, stream protection, and erosion control. Logging roads may contribute as much as two-thirds of the sediment coming from forest lands (Smith, 1975). Poor road layout, construction, and maintenance are associated with increased landslide activity and scouring action by mudflows (Fredriksen, 1970). Buffer strips along streams, which are required by the forest practice rules, have proved to be highly effective for protecting water quality and fish populations from logging activities (Fredriksen, 1970; Moring, 1975). Gillick and Scott (1975) found that a selectively logged 50-foot buffer maximized the present net worth of the combined fish and timber resources.

In northern California the contribution of logging practices to the total sediment load has yet to be determined (Miles, 1975). In this region, especially along the coast, large amounts of sediment come from the erosion of unstable stream banks and streambeds and from mass landslides activated by periodic catastrophic floods. This natural instability results from shear zones of pulverized rock and unstable geological structures underlying much of the area (Callaghan, 1972).

4.3.2.2. To the industry. California's forest industry benefits indirectly from the strict regulations it must comply with. Better planning results in fewer road failures and landslides. Higher standards for road building also reduce failures and lower maintenance costs. The restocking requirements produce a new stand of trees faster than before, thus helping to maintain the resource base. Perhaps the most important benefit to the beleaguered forest industry is improved public relations. Statements by critics such as Richard Janda, that destructive logging practices have stopped on lands surrounding Redwood National Park (National Forest Products Association, 1977), lend credence to the industry's claim that it is indeed doing a good job of protecting the environment.

4.4. Oregon

4.4.1. Costs

4.4.1.1. Administration and enforcement. The forest practices budget request for the fiscal biennium 1973-75 was \$1.7 million. After much debate, the legislature allocated \$1.1 million (Lyons, 1975). Only 60 percent was appropriated from general funds. The additional 40 percent came from fees collected from forest industry--a \$12.50 permit to operate power equipment, a \$1-per-acre fee for clearcutting (the first 10 acres exempt), and a 10-cents-per-acre fee for partial cutting (the first 100 acres exempt). In this fiscal biennium, the state spent between 8 and 9 cents per thousand board feet administering the Act. Douglas-fir sawmill log prices in 1974 averaged \$180.50 per thousand, and \$168.50 in 1975. For the fiscal biennium 1975-77, \$1,263,460 was allocated, using the same 60-40 division between

general funding and fees. An initial shortfall in collected fees occurred because the Forest Service refused to supply a list of loggers operating on the national forests. The Forest Service is now sending a list of loggers and the acreages harvested to the Forestry Department, which collects the fees from the loggers (Manock, 1976).

The major costs of administering and enforcing the Forest Practice Act fall into two categories: (1) inspections, preoperational and preventative (during operations); and (2) training of inspection officers. In 1973, 10,736 notifications were filed, and 1040 preoperational and 7312 preventative inspections (67.1 percent of the active operations) were made. The number of notifications in 1974 was 12,068, with 740 preoperational and 8328 preventative inspections (68 percent of the active operations) being conducted. For 1975, the number of notifications was 15,344, and the number of preoperational and preventative inspections was 519 and 8948 (57.5 percent of the active operations), respectively. The average time spent traveling to and inspecting each operation was 1.4 hours. Beginning in 1977, stocking-level inspections will have to be conducted on lands cut over since 1972. During the 3 years, 1973 to 1975, 6437 manhours were spent in training inspection officers (Oregon Department of Forestry, 1975).

The Woodlands Assistance Program for small nonindustrial owners has been severely curtailed since 1972. One-half of the program's manpower allocation has been transferred to forest practices inspection duties (Lyons, 1975).

4.4.1.2. Compliance. Forest industry in Oregon pays 40 percent of the cost of policing itself through permit fees. For the fiscal biennium 1975-77, this represents over \$500,000.

Since the Act's passage in 1971, loggers have increasingly shifted away from tractor logging, especially on steep slopes and erodible soils, to cable yarding systems. The per-unit operating cost of cable yarding is approximately 10 percent higher than for tractors. Cable yarders are also a much larger capital investment than tractors. Overall, logging costs have increased about 7 percent, or between \$2 and \$2.50 per thousand board feet, in achieving compliance. In 1974, 4047 million board feet were harvested on private and state lands, making the cost of compliance \$8,094,000 to \$10,117,500. The value of the harvest was approximately \$730,483,500; thus the cost of compliance represents 1.1 to 1.4 percent of the harvest's value. Improved road construction and maintenance, yarding, and stream protection were the primary causes of the increase (Richen, 1976).

The rules causing the cost increases for road construction and maintenance are directed at protecting water quality. Improved design and higher planning standards increase road layout time considerably. Increased end-hauling and erosion-control treatment of side-casting and excavated material is required to keep sediment out of streams. Use of permanent and semipermanent erosion-control devices has increased significantly. These changes have increased associated road costs by 20 to 25 percent (Richen, 1976).

Yarding costs for both tractor and cable operations have risen from providing increased protection to the streamside environment. Tractors are prohibited from operating in streams except at designated stream crossings. The crossings must be constructed to allow free passage for water and fish, and must be removed when the operation is complete. In cable yarding, logs must be completely suspended if passing over a Class-I stream (a stream important for domestic use, recreation, or fish). Logs do not have to be completely suspended over Class-II streams (Class-I headwaters, or minor drainages of limited value for domestic use, recreation, or fish), but the stream banks and riparian vegetation must not be unnecessarily damaged.

Increased cable-assisted felling, debris removal and more careful operations around streams have increased stream-protection costs. Cable-assisted felling is used to pull trees away from streams, preventing damage to the banks and vegetation. Although felling costs are 68 to 106 percent higher than for conventional felling, the value of the logs is greater because of reduced breakage, and yarding costs may be lower (Dyksta, et al., 1976). Debris falling into, or close to, a stream must be removed during the operation to prevent debris jams from blocking the stream. The most common method is hand removal, which cost approximately \$60 per ton (Dyksta, et al., 1976). Unmerchantable shade-producing and soil stabilizing vegetation must be left along Class-I streams. If 75 percent of this vegetation cannot be left, then merchantable trees must be left if necessary to prevent a significant increase in water temperature. Along Class-II streams, a strip of undergrowth vegetation must be left to maintain

soil stability. There is no required width for the buffer strip along either class of stream.

4.4.2. Benefits

4.4.2.1. To the public. The forest and its industry is the state's most important land use. Forty-three percent of Oregon is covered by forest, most of it commercial. National forests contain 47 percent of the forest land, other public holdings 14 percent, industrial ownerships 20 percent, and small private ownerships 18 percent (Oregon Forest Industries, 1976). Forest industry provides 10.12 percent of the total nonagricultural employment and 42.96 percent of the total manufacturing employment (U. S. Bureau of Labor Statistics, 1975).

The public benefits attributable to the Forest Practices Act derive primarily from the protection of water quality and fish populations. Significant improvements have been noted on operations in strict compliance with the rules (Manock, 1976). The Departments of Environmental Quality and Fish and Wildlife are relatively satisfied with the protection their spheres of responsibilities receive. Fine tuning of the rules based on research now underway is expected to maximize this protection, given the constraint of maintaining the state's large forest industry (Carter, 1976; Harper, 1976; Fries, 1976). The satisfaction with the rules of the environmentally oriented departments is attributed to their adequacy and the excellent inter-agency cooperation that aided in drafting them.

4.4.2.2. To the industry. The primary benefit to forest industry is improved public relations. Adherence to high environmental performance standards maintains industry's credibility with the public.

Independent contract loggers and all the large companies must now meet the same standards that some large companies were already meeting or exceeding (Crown Zellerbach, 1974).

The Department of Forestry has placed primary emphasis on education and cooperation rather than punitive enforcement. This has helped to inform on-the-ground personnel of the environmental impacts of their actions and how best to mitigate or eliminate those impacts. Forest industry as a whole has accepted the Act as necessary and has tried sincerely to comply (Skill, 1975). This is understandable because industry pushed for it and helped draft its rules.

4.5. Washington

4.5.1. Costs

4.5.1.1. Administration and enforcement. Washington's forest practices budget for fiscal 1976 was \$900,000 and for fiscal 1977, \$1,100,000. For these 2 years, the state spent an average of 15 to 25 cents per thousand board feet of harvested timber administering and enforcing the Forest-Practices Act. Douglas-fir sawmill log prices in 1975 averaged \$168.70 per thousand board feet (Ruderman, 1976). The review of notifications, applications, and detailed environmental statements, and the inspections to ensure compliance constitute the major cost categories.

In 1975, 7781 applications for Class-III and -IV forest practices and 2608 notifications of Class-II practices were filed. The most common practices involved were clearcutting, 37 percent; partial cutting, 26 percent; and road construction, 23 percent (Halbach, 1976).

Inspections are conducted by the Department of Natural Resources. Preoperational inspections are usually conducted only for Class-IV applications to determine if a detailed environmental statement is needed. Most Class-II, -III, and -IV operations are inspected at least once during their active periods and may be inspected after completion. A final reforestation inspection is made after the receipt of the forest landowner's reforestation report. The D.N.R. employs 80 to 100 forest-practices inspectors with instructions to try education and persuasion before citing an operator for a violation (Hawley, 1976).

Two other departments, the Department of Ecology and the Department of Game, are also involved. The D.O.E., originally an enforcing agency, conducts its own inspections and reports violations to the D.N.R. As part of the 208 nonpoint source pollution planning and control program, the D.O.E. has begun a monitoring program to determine the impacts of the forest-practice regulations on turbidity, suspended solids, and water temperature (Washington Department of Ecology, 1976). Bimonthly aerial monitoring is used by the Department of Game to monitor stream turbidity levels during forest operations (Descamps, 1976).

4.5.1.2. Compliance. Washington's forest industry as a whole has incurred a relatively small cost increase in complying with the Forest-Practice Act--approximately \$2.00 to \$3.00 per thousand board feet, representing a 5- to 10-percent increase chargeable to the Act (Stolaas, 1976). Washington's 1974 private and state harvest was 5,022 million board feet. Based on this volume, the cost of compliance

was \$10,044,000 to \$15,066,000. The value of the harvest was approximately \$906,471,000, making the cost of compliance 1.1 to 1.7 percent of the value. The major cost increases were experienced by the small-scale contract loggers, because many of the large companies were already meeting or bettering the regulations (Agreement: Department of Fisheries, Department of Game and Weyerhaeuser Company, 1971). Road construction and maintenance standards and operational restrictions to protect water quality are the primary reasons for the cost increases.

Based on the D.N.R.s pre-1967 logging road standards, a mile of road cost an average of \$29,353 to build. After allowing for inflation, road-building costs under the new regulations have gone up an average of \$16,368 per mile, a 50 to 60 percent increase (Washington Forest Practices Board, 1976). Planning and layout time have increased significantly. End hauling of excavated material has become a common practice, costing \$1.50 to \$2.50 per cubic yard. To protect water quality, the regulations require increased use of permanent and semipermanent erosion-control devices such as culverts at stream crossings, better and more extensive drainage systems, and increased bridge construction.

Within the Streamside Management Zone, the cost increases from operational restrictions are highly variable. Along streams that are not temperature sensitive, the increase is small, caused by taking reasonable care to protect the zone's unmerchantable vegetation. However, if the land is not intensively managed, competition and reforestation problems can reduce timber growth by 40 percent on the

83,500 acres within the zone, statewide. If the stream is temperature sensitive, some merchantable trees may have to be left as shade to protect fish populations from an increase in water temperature. Each year approximately 65 miles of temperature-sensitive streams are exposed to timber-harvesting activities (Washington Forest Practices Board, 1976). Use of cable-assisted felling within the zone has also increased costs.

Tractor and wheeled skidding systems have incurred additional costs, for slope and soil-moisture operating restrictions in some areas have significantly shortened the logging season. Cable yarding systems have experienced little or no cost increase (Washington Forest Practices Board, 1976).

The reforestation requirements may cause increased costs to some landowners if their first attempt fails to provide complete stocking. Supplemental planting is required to bring the land into compliance.

Because wood products are in world markets and in competition with many substitute products, only a small percentage of the total cost increase can be passed on to consumers. Therefore these costs will have to be absorbed by the landowner through decreased stumpage prices and by the operator through decreased profits unless he can increase his efficiency.

4.5.2. Benefits

4.5.2.1. To the public. Washington's economy, historically and at present, is highly dependent on the use of its forest resources. Of the state's 42,605,000 acres, forest land constitutes the major land use, covering 54.2 percent of the state. Of the forest land,

79.66 percent is classified as commercial. The national forests and other federal holdings contain 39.31 percent of the commercial forest lands; state and local holdings, 12.42 percent; forest industry, 23.63 percent; and other private properties, 24.64 percent. Forest industry is one of the state's major employers, providing 5.55 percent of the total nonagricultural jobs and 26.27 percent of all manufacturing jobs (U. S. Bureau of Labor Statistics, 1976).

Improved water quality is the primary public benefit associated with the Forest Practice Act. Mass soil movement from poorly located or constructed logging roads is the most common and significant contributor to nonpoint source pollution in the Pacific Northwest (U. S. Environmental Protection Agency, 1975). Improved road drainage systems prevent large amounts of sediment from being channeled into streams and reduce road failures. The culvert and bridge requirements reduce the probability of failure from blockage and washout. Directional felling and the prohibition against yarding logs in or through Class-I, -II, and flowing -III streams protect stream bank integrity. Removing debris from in and around streams prevents debris jams and reduces the impact on the stream's dissolved oxygen content. Faster and more complete reforestation curtails surface erosion and produces visual amenities sooner.

Native and anadromous fish populations are totally dependent upon the maintenance of high water quality. Logging debris and clogged culverts can completely block fish passage, making reproduction impossible. Road failures have inundated spawning areas with silt, barring miles of stream to fish production. The regulations will

have a positive impact on the state's valuable fisheries resource. The combined value of the 1973 commercial and sports salmon catch was \$145,376,500 (Washington Forest Practices Board, 1976).

4.5.2.2. To the industry. Forest industry in Washington benefits from the Forest Practice Act in the same way as in Oregon. Some large companies were already performing up to the Act's standards. The number of violations is about equally divided between large- and small-scale operators, but on a volume-harvested basis, the small firms represent the more serious problem. Making all operators conform to standards that the most progressive companies were meeting has proved to be a considerable public-relations advantage to the whole industry. Most environmentalists have adopted a wait-and-see attitude towards the regulations and the industry until experience can show what improvements are needed. Forest industry is pleased with the Act and the regulations because it was the industry's political power that finally won acceptance for these public measures.

5. CONCLUSIONS

5.1. The Evolution of Social Controls for Forest Practices

Forest management reform has its roots in the mid-nineteenth century. Pressure to stop the extensive deforestation that was occurring because of logging and fire came from scientists and engineers concerned about climatic and waterflow changes. Private landowners established the first forest fire-control cooperatives. Not long after, the states began to establish forestry agencies to cooperate with, or replace, the private organizations.

During the 1920s and 1930s, forest landowners began to agitate for reform of the ad valorem property tax. They maintained that the existing system made it financially unprofitable to hold cutover lands until the end of the next rotation. At the urging of the forest industry and the forestry profession, a number of states adopted some form of yield tax. During this period the cost of obtaining old-growth stumpage rose about the cost of holding cutover land and growing a new stand of trees, making it financially desirable to hold the land through successive rotations.

In the late 1930s, the threat of an imminent wood shortage became an important issue in the state legislatures and the Congress. At the urging of the Forest Service, the Congress tried several times to pass legislation requiring reforestation. Fear of federal intervention led the organized segments of the forest industry strongly to support state legislation to accomplish the same thing. Industry, in the 13 states that passed forest practice acts, participated heavily in

writing both the laws and the regulations. Because the laws were concerned only with reforestation, a technical rather than a social problem, there seemed to be little justification for the inclusion of social concerns such as water quality, fish, and wildlife. Reliance on cooperation and voluntary compliance rather than punitive enforcement made it desirable to have the regulations written by representatives of the industry and the landowners, in order to make compliance as palatable as possible.

Demand for public goods -- clean air and water, wilderness, recreation opportunity -- increased during the mid 1960s. A direct outgrowth was the passage of new forest practices acts in the three West Coast states. These laws are designed to protect water quality from forest operations. Such protection calls for a different regulatory approach. Rather than simply requiring that an adequate seed source be left, the whole operation has become subject to regulations that control its conduct. Thus, forest practice regulation has followed the same course as other land-use controls, such as zoning, that first restricted the uses that could be made of the land, and now regulates the manner in which these uses are carried out.

5.2. Criteria for Evaluating the Success of a State's Forest Practices Act

5.2.1. Improvements in Existing Conditions

To judge the effectiveness of a regulatory law, it is necessary to establish criteria against which performance can be measured. First, the law's intent must be clearly understood. What exactly is the

legislature trying to accomplish, and how does it propose to do this? In the case of the early forest practice acts, reforestation was the goal, and requiring that an adequate seed source be left was the method. Laws passed since 1970 are intended to protect the environment from the adverse impacts of forest practices by requiring more planning before, and care during, operations, and modifications in the conduct of the operations.

Ideally, measures or indicators should be developed so that pre-regulatory conditions can be compared with what is occurring under the regulations. This requires objective or quantitative base-line data on water-quality parameters -- turbidity, suspended solids, nutrient content, and temperature, rate and timing of road failures, reforestation success, and anything else that is important to the achievement of the act's objectives. Unfortunately there is little such information available, and its applicability is limited, especially on the West Coast, because of the wide variations in soils, climate, and topography. Extensive monitoring programs are necessary to determine if the regulations are accomplishing their purpose, and to reveal needed changes.

5.2.2. Financial Impacts of the Regulations

5.2.2.1. On the operator and landowner. Nonpoint-source pollution is best controlled by preventative management techniques rather than after-the-fact punitive enforcement. How much prevention is enough? Traditionally, a person could use his land and water in any manner if he did not impair his neighbor's reasonable use of land and water.

This concept is questionable when applied to nonpoint-pollution control because of the cumulative nature of man's activities. A single timber harvesting operation, in compliance with all regulations, would not violate water-quality standards, but the combined impact of several operations would do so if conducted in the same watershed at the same time. Antidegradation clauses contained in water-quality standards do not allow for the unavoidable short-term impacts caused by precipitation or shade removal. Once logging is complete, water quality will usually return to its undisturbed state within 3 to 5 years.

If the state is willing to allow short-term degradation, then regulation rather than prohibition is necessary. The strictness of the regulations will depend on the state's perception of the problem's severity balanced against the financial impact on the forest industry. Regulations that are too strict force marginal firms and even some profitable firms out of business. If the regulations are too weak, then no improvements will result. A strong, viable forest industry provides jobs and pays substantial taxes. The question of the strictness of the regulations involves a trade-off between public benefits and private costs. Successful regulatory programs would seek a socially desirable optimum by equating the marginal public benefit with the marginal private cost to produce it. Unfortunately, this kind of analysis is all but impossible because many public benefits are not at present monetarily quantifiable, and the actual cost to produce them is unknown. The monitoring programs to judge the effectiveness of the regulations can be used to develop cost-effectiveness measures for a partial analysis of the benefits and costs involved for a particular practice.

5.2.2.2. On the state. The existence of a regulatory program implies some mechanism for enforcement. Optimally, the cost of the program would be set where the marginal cost of enforcement equals the marginal benefit gained. Again the problem is gathering meaningful data for the analysis. The increased use by state governments of cost-accounting, management-by-objectives and program budgeting is the first step in developing the necessary information. A relatively new analytical technique, goal programming (Lee, 1972) provides an excellent method of examining quantitatively the trade-offs among objectives with different priorities.

5.2.3. Administrative Development

A regulatory program's success depends a great deal upon the attitude of the regulated parties: whether they are moderately well satisfied that their interests are being protected. Cooperation and compromise from all the parties involved will produce a more stable situation than when competition between opposing viewpoints polarizes the issues. Regulation of forest practices requires a great deal of voluntary compliance because of the time and money necessary to provide even a minimal level of enforcement. Like anyone else, members of the forestry industry will comply most readily with regulations that most closely correspond to their concepts of what is right. Therefore, it is imperative that their cooperation and input be enlisted as early as possible in the period when laws and regulations are being drafted. Opposing interest groups must also be consulted if the program is to gain public acceptance.

The foregoing conditions apply also to the state agencies involved. Did the agencies cooperate to ensure that the rules promulgated fulfilled the law's intent, or was there rivalry between them as each tried to increase its sphere of influence? When a single agency is responsible for enforcement, the other agencies must trust this agency to enforce their responsibilities adequately. Rivalry is not conducive to the formation of this kind of trust. Multi-agency enforcement requires a high degree of cooperation if the agencies are to avoid issuing contradictory orders and instructions. Has the state made an adequate attempt to educate the operators and interest groups about the regulations? Unless operators have been adequately informed about the regulations, what they are trying to accomplish and why, cooperation and voluntary compliance will be replaced by distrust and confusion. Uninformed interest groups will be less likely to cooperate and compromise. Education performs the function of illuminating the trade-offs so that a compromise can be reached.

5.3. Successful Administrative and Enforcement Features

5.3.1. Rule Formulation and Promulgation

Perhaps the most important feature of any regulatory law is the way regulations are formulated and promulgated. There are three basic approaches:

1. The legislature can write the regulations into the law. No doubt applicable in some areas, forest practice regulations do not ordinarily lend themselves to this approach. Lack of information on cause and effect relationships, and costs and benefits requires an

incremental or evolutionary approach to regulations. This implies slow but constant changes as the results of research become available. Legislatures cannot be counted on to provide the necessary amendments when needed, given the time constraints under which they work.

2. Control may be vested in a single administrator, a member of the governor's cabinet, who implements policy and promulgates the regulations. Under effective leadership, this system is highly efficient and clearly places the responsibility in the governor's chair. At the same time, it is subject to rapid leadership changes after elections, making continuity of purpose and direction difficult to maintain. Elections are not usually decided on one issue. Even if the governor's appointed administrator has done an outstanding job, good or bad, it is doubtful that voters will decide a gubernatorial election on the basis of forest practice regulations.

3. The most successful approach is the use of part-time, independent forest practice boards to promulgate regulations based on the policy established by the legislature in the forest-practices act. This approach is not particularly fast or efficient, nor are board members directly accountable to the public. But in forest practice regulation, speed and efficiency are relative. A number of years may be required to collect adequate data for decisions, and in the meantime judgment may be the only recourse. Fixed terms allow incompetent board members to be removed eventually. Staggering the terms provides continuity and prevents sudden changes in the direction and focus of the regulations. Occupational and subject-matter qualifications for members help to ensure that knowledgeable persons are appointed, and allow a great deal of professional self-regulation. In general, the

industry and the profession have been the only constant supporters of good forestry. Public sentiment has been difficult to mobilize and maintain because the benefits are dispersed but the costs are not. Inclusion of public members and extensive use of public hearings provide a diversity of viewpoints and a forum for interaction between the board and the public.

Regional committees and technical subcommittees have proved to be valuable assets. Variations in climate, topography, and dominant tree species make regional regulations indispensable. Certain problems such as road-construction and maintenance standards and snag retention for wildlife are best examined by a small group of experts who can provide the board with the appropriate background information and work out alternative strategies.

5.3.2. Administration and Enforcement

Activities on forest lands affect the interest of many agencies -- water and air quality, public health, fish, wildlife, and the use of pesticides and herbicides. The experiences in California and, for 1 year, in Washington have shown that multi-agency enforcement results in nothing but confusion. On the other hand, single-agency enforcement by the state forestry agency appears to work well. Other agencies can provide expert assistance within their areas of concern, but most lack on-the-ground experience in dealing with forest operations. Use of one agency to enforce all environmental responsibilities avoids costly duplication in training personnel and making inspections. Jurisdictional fights are avoided. The operator and landowner benefit by dealing with only one agency because red tape, delays, and contra-

dictory orders are minimized.

With single-agency enforcement, the regulations must be designed to accommodate all environmental responsibilities. Forest practice regulations are designed to prevent or minimize impacts on public resources. Compliance with the regulations must be considered presumed compliance with the applicable standards and regulations of the other agencies. This approach to the matter requires considerable trust and cooperation between the agencies during regulation formulation and continuing thereafter. The presumed compliance factor must be written into the forest practices act or formalized by a written agreement between the agencies. If not, the timber operator is placed in a position where even if he does everything according to the forest practices regulations, he is still subject to fines imposed for violating the standards or regulations of the other agencies. It is not difficult to envision the potential for confusion and harassment inherent under these conditions.

5.3.3. Timber Harvesting Plans Versus Notifications

If intraregional variations in climate, soils, topography, and dominant tree species are as great as interregional variation, attempts to formulate regional and statewide regulations will be only partially successful. In that case, requiring submission and approval of a timber harvesting plan serves a useful purpose by providing an administrative device to ensure that the operator has adequately considered the relevant environmental factors. The T.H.P. can identify unique areas and endangered species, and specify the steps proposed for protecting them. Useful data can be collected from the plans -- soil

types, volume of the expected harvest, and the type of practices employed. Filing a plan provides for the operator an immediate contact with the enforcing agency that serves to enhance his knowledge of the regulations and improve his compliance because he will be less likely to put an inadequate plan into operation.

But there is another side to the T.H.P. approach. In some cases, the extreme variations that justify a T.H.P. imply that forest conditions are so fragile that timber harvesting probably should not take place. In other cases, since preparing, filing, and obtaining approval for a plan costs the operator and landowner considerable time and expense, it is doubtful that the public benefits of the additional information and compliance are greater than the private costs and the state's cost for reviewing the plan. An alternative system, then, is to be preferred.

A notification system is the simplest and least costly to administer. If the agency can trust the average operator adequately to consider environmental factors when planning and carrying out the logging job, enforcement efforts can be concentrated on inspections. Unless the agency is thoroughly familiar with the area covered by the notification, it may not know what critical environmental factors need to be considered unless and until its representatives actually visit the scene.

Classifying forest practices according to their potential for environmental damage and establishing separate filing requirements for each class combines the best features of the T.H.P. and notification systems. No notification is required for practices with a low

minimal potential impact, and for intermediate practices a notification is required. When there may be serious environmental impacts or when other land uses must be considered (e.g., around parks and recreational areas), an application similar in detail to a T.H.P. is used. This allows the agency to consider properly the preventative measures to be followed, to judge their adequacy, and to determine if either preoperational inspection or an environmental impact statement is necessary.

A priority inspection system based on the potential for environmental impacts meshes well with a classification system. Costs to the state are minimized by concentrating enforcement efforts on problem areas rather than requiring a certain number of inspections for every operation.

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THE BACKGROUND OF STATE FOREST PRACTICE LEGISLATION AND ITS
IMPACT UPON FOREST LAND USE AND MANAGEMENT

by

John Carter Jones

(ABSTRACT)

Five states were chosen for the study: New York, Massachusetts, California, Oregon and Washington. The author visited each of the five states and Washington, D.C. in 1976 to collect writings, published and informal, and to interview persons concerning the historical background and implementation of the states' forest practice acts.

The changing national attitudes toward the use and abuse of forest resources was traced as historical background. For each state, the political forces involved with forests were examined to determine how they contributed to the development and current form of the forest practice act. The purposes for which the states' acts were passed were analyzed. Available information on costs and benefits were included to illustrate what a state might expect if it decides such a program is desirable. Criteria were developed for evaluating the success of a state's forest practice act. A list of apparently successful features of selected administrative and regulatory systems was included to illustrate what form a model forest practice act might take.

The criteria for success that were developed are: (1) improvement in existing conditions; (2) financial impacts on the timber operator,

forest landowner and the state; and (3) the administrative development of regulations. Successful administrative and enforcement systems were: (1) part-time, independent forest practice boards promulgating regulations based on legislative policy; (2) single agency enforcement; (3) classification of forest practices according to their potential for environmental damage; and (4) a priority inspection system.