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The Status and Impact of State and Local Regulation on Private Timber Supply

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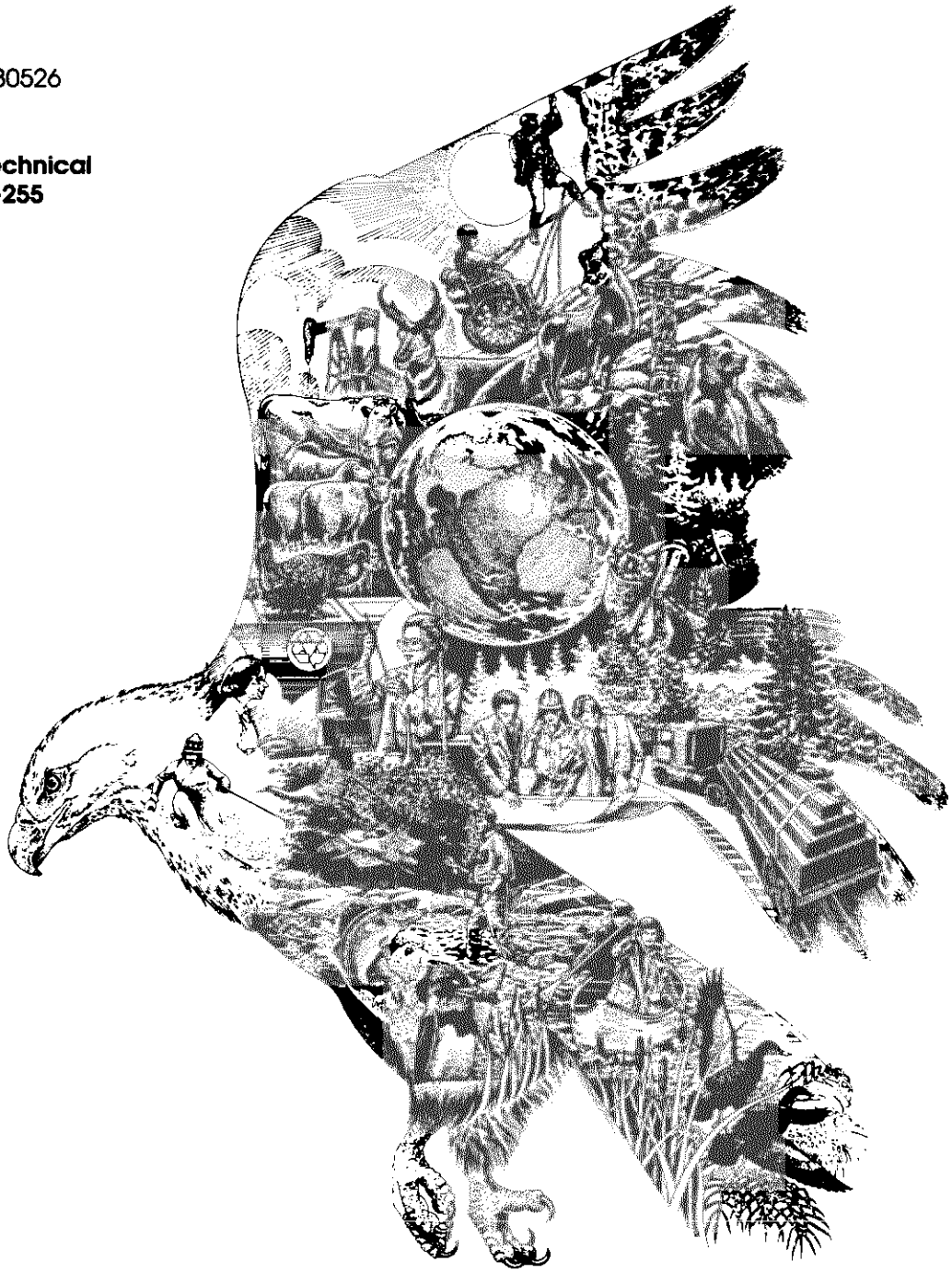

Abstract

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State and local regulatory enactments that affect private forest management are identified and summarized. The results of a Delphi technique survey of the current and long-term effects of such regulation on private timber harvests, and TAMM projections of their impact on U.S. timber supply and price, are described.

Keywords: Timber supply, state and local regulation, RPA, assessment

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The Status and Impact of State and Local Regulation on Private Timber Supply

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The Status and Impact of State and Local Regulation on Private Timber Supply

John L. Greene and William C. Siegel

As harvests from public forests have diminished in recent years, the market and market analysts have looked to private forest lands to provide more of the timber supply. At the same time, however, there has been an increase in state and local regulation (Hickman and Martus 1991) that directly or indirectly affects the management and productivity of private forests.

Searches conducted in 1992 identified 644 individual forest regulatory laws that had been enacted throughout the U.S. (fig. 1). Of these, 117 were at the state level, and 527 at the local level (fig. 1). State statutes include water quality, endangered species, and forest practice laws. The greatest number of state laws occurs in the North (fig. 1); but the Pacific Coast region has the longest experience with this type of regulation.

Many laws — 170 nationwide — were passed at the county level (fig. 1). Ninety percent of the county ordinances affecting private forest management were enacted in the past 10 years, and two-thirds (66%) in the past 5 years (Martus 1992). Examples include ordinances to control erosion and stream sedimentation, and to protect county roads and bridges from damage by logging trucks. Most county-level ordinances occur in the South (fig. 1).

The remaining 357 enactments were passed at the municipal level (fig. 1; for this paper, the term "municipal" includes all units of government smaller than a county). Three-fourths of the total (76%) date from the past 10 years, and more than half (54%) from the past 5 years (Martus 1992). Many different types of municipal ordinances affect private forest land management. Examples include ordinances to protect shade trees and greenbelts, to prescribe silvicultural practices, and to limit hours of operation for heavy equipment. Most municipal-level ordinances occur in the North (fig. 1). County and municipal ordinances in particular tend to be passed independently, without coordination with other levels of regulation, and often without full understanding of their potential ecological and economic effects.

The objectives of this study were:

1. To identify and describe, by Resources Planning Act (RPA) region, and for the United States as a whole, the state and local regulatory enactments that affect management and productivity of private forest lands, and

2. To estimate, by RPA region, and for the United States as a whole, the current and long-term effects of such regulation on private timber harvests and on timber supply and price.

METHODS

State and Local Regulatory Enactments

Before this study, the Law and Economics research unit of the Southern Forest Experiment Station already had compiled and tabulated a considerable amount of information concerning the various state laws that affect forestry. However, very little was known about the nature and extent of local government regulation. Therefore, most of this effort focused on local government ordinances.

State Statutes

Three types of state legislation were considered in the study: water quality and wetland protection laws, endangered species laws, and forest practice laws. These account for most of the state regulatory impact on private timberlands. Existing information for these

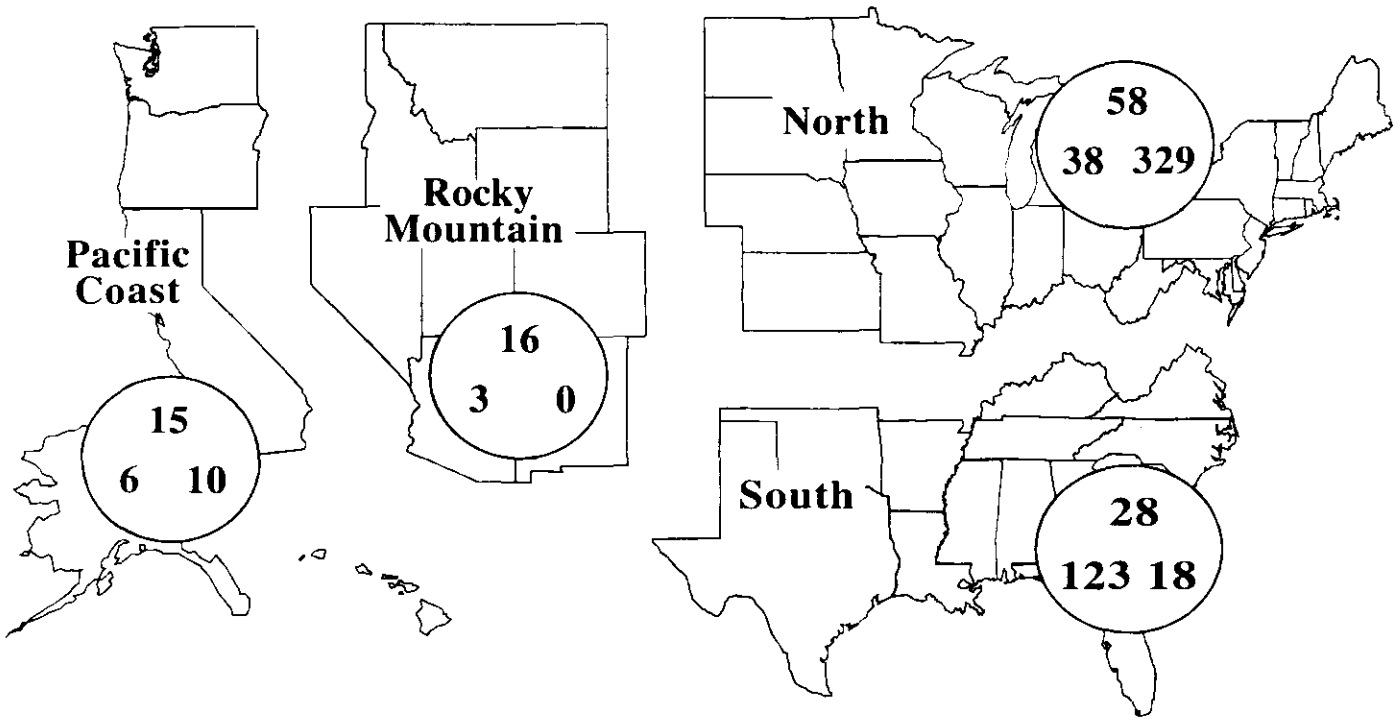
statutes was updated, primarily by examining state statute compilations for amendments to existing laws and for new legislative enactments. This was followed by telephone calls to knowledgeable individuals within particular states, and with a comprehensive review of existing literature on the subject.

Local Ordinances

Analysis of local regulation was complicated because local government ordinances are not systematically incorporated into any form of centralized legal or legislative reporting system. The little existing literature on local forestry regulation discussed only measures enacted within a particular state, and even then, usually in a very general way.

Local government forestry ordinances were surveyed using a variety of methods. Existing ordinances were identified by reference to published articles, and by mail and telephone inquiries. Authors who had written on the subject, state forestry agencies, state forestry associations, extension foresters, university faculty members, loggers, industrial and consulting foresters, local government officials, and government associations were the primary sources used to compile information. Persons contacted also were asked to provide the names, addresses and telephone numbers of additional sources of information on the subject. This process was continued until all leads were exhausted.

In most cases, the contacts were able to provide only the names of local government entities that had enacted ordinances. These were contacted, either by mail or telephone, to obtain copies of the ordinances. Five items of information were tabulated for all ordinances collected: name of the government entity, legislative citation and date of adoption, purpose and intent of the ordinance, important regulatory provisions, and the named enforcement individual or agency. When possible, information also was obtained on how strictly the ordinance was being enforced by local officials. These data were analyzed in terms of type of ordinance, regional differences, legislative history, and national and regional trends.



KEY: Top Number = ... Number of state laws in the region that affect management of privately owned forest lands.
Lower Left Number = ... Number of county ordinances in the region that affect management of privately owned forest lands.
Lower Right Number = ... Number of municipal ordinances in the region that affect management of privately owned forest lands.

Figure 1.—State and local regulation in the United States, by RPA region.

Effect of State and Local Regulation on Timber Supply

Effect of Regulation on Private Timber Harvests

The effect of state and local regulation on private timber harvests was estimated using the Delphi procedure. The procedure was developed by the Rand Corporation, in the 1950s, to solve complex planning problems in engineering and defense. It is a systematic process for combining the knowledge and judgement of a small number of experts in a given field. It is well suited to studies such as this one, where a mathematical model would require too many assumptions to provide meaningful results (Gregersen et al. 1989).

The Delphi procedure has been used to investigate various natural resource topics, including future leisure environments (Shafer et al. 1974), elk habitat quality (Schuster et al. 1985), and state forest policy alternatives (Baughman and Ellefson 1983, Henderson et al. 1992). In the technique, researchers prepare a questionnaire and submit it to selected experts. The results are summarized and returned to the experts, who are given an opportunity to revise their answers. The procedure often is ended at that point; but the summarization and revision steps can be repeated until a desired level of consensus is reached (Gregersen et al. 1989).

Survey Steps

We considered a sample size of approximately 80 as large enough to provide reliable results at the regional level while still being manageable. Starting from an initial design of one respondent per state, we added one respondent each for states with more than 5% of all private forest land in the United States, and one each for states with more than 5% of the state and local enactments identified in the first part of the study (Martus 1992). We eliminated from the sample five states with little private forest land compared with others in their region, and with no county or municipal regulation affecting private forests: Alaska, Delaware, North Dakota, Rhode Island, and Wyoming.

To identify the most qualified individuals to participate in the study, we conducted a presurvey of persons in each state to be sampled. Some of the persons contacted had cooperated in the first part of the study (Martus 1992); the others were affiliated with state agencies and associations identified in the National Wildlife Federation Conservation Directory (1992). After contacting them, we described the purpose of the study and asked them to name the individual or individuals best qualified to respond for their state and region. To the extent possible, the individuals selected to participate in the study were recommended by two or more persons. Many were named by persons in states throughout their region.

The first step of the Delphi survey was conducted during summer 1992. The selected individuals were contacted by mail at least 1 week before survey calls began in their region. The letter introduced the study, invited them to participate, and emphasized the importance of their response in this small-sample procedure. Then, in telephone calls, the respondents were guided through the questionnaire described later and were asked to answer the questions based on their individual knowledge and experience. The results were coded by region; and the high, low, and median responses for each question were determined.

During the first survey step, it was necessary to make minor adjustments to the sample. A few of the invitees were unable or declined to participate in the study, and were replaced in the sample by alternates selected from a prepared list. In addition, the sample size was increased to 83, to obtain at least three responses for each state.

Table 1 shows the final sample, by region and respondent occupation. The number of respondents per region averaged 21, but varied according to the number of states, the number of private forest land acres, and the number of state and local enactments (table 1a). Respondent occupations were nearly evenly divided between the public and private sectors (53% versus 47%, respectively; table 1b).

The second step in the Delphi survey was conducted during fall 1992. The original respondents were contacted and guided through the questionnaire a second time. At each question, they were reminded of their original answers, were provided with the high, low and median responses, then were given an opportunity to revise their answers. Second-step interviews were completed with 81 of the 83 respondents. In the two missing cases, we kept the respondents' answers from the first survey step in the final data set, rather than lose the information.

Survey Questionnaire

The questionnaire consisted of four parallel series of questions, one each on state water quality regulation, state endangered species regulation, state forest practice regulation, and county and municipal regulation. In each series, we asked the respondents whether regulation of that type currently had any noticeable effect—either positive or negative—on timber harvests from private forest lands, in states in their region. If they answered "yes," we asked them to describe the nature of the effect and estimate its extent.

Then we asked the respondents whether they expected regulation to have any additional effect on private timber harvests—positive or negative—over the next 10 years. Again, if they answered "yes," we asked them to describe the nature of the anticipated effect and estimate its extent. Next, we asked them to estimate how fully the existing regulation was being enforced and whether they expected that to change in the foreseeable future. Finally, we asked them to estimate the likelihood that additional regulation would be passed in the foreseeable future, and to predict its time frame and nature.

For each question, we collected responses by ownership class (forest industry or nonindustrial private) and by species and product group (hardwood pulpwood, hardwood sawtimber, softwood pulpwood, and softwood sawtimber). After a questionnaire was completed, we summed the estimates for current and anticipated future effects, and asked the respondent whether the totals were what he or she intended. If they were not, we asked the respondent to help us to adjust the answers.

Table 1.—Number of respondents in the study sample, by geographic region and occupation.

Category	Number of respondents
a. By Geographic Region	
North	36
South	28
Pacific Coast	10
Rocky Mountain	9
Total	83
b. By Occupation	
Public agency	31
Academic/Extension	13
Consulting forester	14
Forest industry	12
Association	10
Forest land owner	3
Total	83

Preparation of Survey Results

As is typical in a policy-oriented Delphi study, the second survey step narrowed the range between the high and low responses for each question, but did not produce full consensus. This was particularly the case for questions requiring the respondents to predict a future condition. The findings reported and discussed in the results section are the median response for each question in each region. They were calculated by weighting the median responses for each state by the estimated harvest of each species and product group from each forest ownership class (Waddell et al. 1989), then summing them to yield regional totals.

Effect of Regulation on Timber Supply and Price

The median Delphi survey results were submitted to the USDA Forest Service Pacific Northwest Forest and Range Research Station, where they were used to help formulate alternative future scenarios in the Timber Assessment Marketing Model (TAMM) to project the effect of state and local regulation on future timber supply and stumpage prices. Station scientists returned three separate projections for the years 1990 through 2040:

A baseline projection, which did not include an effect of regulation, for comparison with the other projections;

A current effect projection, which used the Delphi estimates of the effect of regulation at the time the survey was done;

A future effect projection, which used the Delphi estimates of the additional effect of regulation anticipated over the next 10 years.

Output was provided at 10-year intervals through the end of the projection period. It included private timber harvests, by region, ownership class, species, and product group; U.S. sawtimber harvests, by region and species group; and average sawtimber stumpage prices, by region, and species group.

The harvest and stumpage price figures for the year 1990 were historical, and were the same for all three projections. Three assumptions were made in determining the figures to use for the years 2000 through 2040: (1) the current effect of regulation observed by the respondents represents a change since the 1990 base year, (2) the change from current to anticipated future effect will take place uniformly over time, and (3) the future effect will be fully realized within 10 years (i.e., by the year 2003).

In accordance with the assumptions, the figures reported and discussed here, for years 2010 through 2040, were taken from the future effect projection.[2] The figures used for 2000 required an adjusting calculation, because that year is between the time of the survey and the time the future effect was assumed to be fully realized. The adjustment was made by adding to each value in the current effect projection, 70% of the difference between it and the analogous value from the future effect projection.

RESULTS

State Regulatory Enactments

Water Quality and Wetland Protection Laws

State water quality laws that potentially can affect forestry operations were inventoried by Siegel and Haines as part of the 1989 Resources Planning Act (RPA) Water Assessment (Guldin 1988). This review showed that all 50 states have some type of general water quality legislation. A few of these statutes were enacted before 1972, but most are traceable to the requirements of the Federal Water Pollution Control Act Amendments passed in that year.

The state laws differ substantially in their specific provisions, but all are broad in scope. Even in those cases where silvicultural activities are not specifically mentioned in the statute as a possible source of pollution, forestry operations, by implication, could be covered. Nevertheless, most states continue to rely on voluntary means of controlling forestry nonpoint pollution. Only about one-fourth have enacted forestry-specific water quality-related regulatory legislation. Generally, in states that operate within a voluntary framework, the broad water quality laws have been applied to silvicultural operations only on a limited basis. In some states, however, they are beginning to be invoked more regularly.

All coastal states, including those bordering the Great Lakes, exercise some type of regulatory control over the development of wetlands within their coastal zones. Each of these statutes addresses silvicultural operations. The protection of interior freshwater wetlands is much less extensive, but is increasing in scope. About one-third of the states have comprehensive interior wetland protection laws that govern forestry activities within wetland zones.

Endangered Species Laws

All but six states have some type of endangered species law. Those without such legislation are Alabama, Arkansas, Massachusetts, North Dakota, Rhode Island, and West Virginia.

The relationship between the federal Endangered Species Act and state endangered species protection programs occurs in three areas: state-federal cooperative agreements, state endangered species laws, and state forest practice regulatory statutes. Federal law generally preempts state law. In states with cooperative agreements, however, the federal taking provision is enforceable only to the extent that taking is defined in the state law. In such cases, a federal taking violation requires a violation of state law (Quarles et al. 1991).

Not all of the interactions between federal and state legislation have been clearly defined. For example, not all state laws define a taking to include adverse habitat modification, as does the federal law. Several states with comprehensive forest practice regulatory legislation have included endangered species provisions in the statutes.

Forest Practice Laws

Currently, 21 states have formal forest practice regulatory legislation. They are Connecticut, Delaware, Maine, Maryland, Massachusetts, Missouri, New Hampshire, New York, and Vermont in the North RPA region; Florida, Louisiana, Mississippi, Virginia, and West Virginia in the South; Alaska, California, Oregon, and Washington in the Pacific Coast region; and Idaho,

[2]*This report discusses the differences between the baseline projection and the projections of the effect of state and local regulation. The baseline projection itself is discussed in another RPA update document.*

Nevada, and New Mexico in the Rocky Mountain region. Only 10 of these laws can be termed comprehensive statutes, however (Siegel 1990). As the listing indicates, the laws are most prevalent in the North and Pacific Coast regions.[3]

Distribution and Growth of Local Regulation

Number of Ordinances

The survey of local ordinances identified 527 individual forest-related ordinances that had been enacted by 493 separate units of local government in 24 states (table 2). A forest-related ordinance was defined as any ordinance, zoning law, or tree protection article which has been or could be used to restrict silvicultural or logging activities, or the hauling of forest products. Local government refers to any level of government below the state level. Included are counties, townships, municipalities, villages and boroughs.

Of the 493 local governments identified as having enacted forest-related ordinances, 460 had passed a single ordinance. Thirty-two local governmental units in eight states had enacted two ordinances each, and one unit had enacted three (table 3). The largest number of ordinances was found in the northeast, which accounted for more than two-thirds (68%) of all ordinances. The southeast followed, with one-fifth (21%) of the total (table 3).

Date of Adoption

A small fraction of the ordinances identified (5%) had no identifiable date of adoption. Of the others, nearly four-fifths (78%) had been enacted in the past 10 years, and fully half (50%) had been adopted in the past 5 years (table 4).

Level of Government

The number of forestry ordinances enacted in various regions of the country is associated with the level of local authority or "home rule." Possessing the authority to act is a requisite condition for any government wishing to control forestry activities. Levels of local autonomy differ drastically among states and regions. Each state has a unique relationship with its local governments.

The statewide forest practice regulatory acts enacted by most of the forested states in the Pacific Coast and Rocky Mountain regions restrict the ability of local governments to pass independent ordinances regulating forest activities. The north central states also generally limit local government autonomy in this area. Thus, few forest-related ordinances have been enacted in western or north central states (table 3).

Table 2.—Number of forest-related ordinances enacted in the United States, by RPA region and state.

Region and State	Number of ordinances
a. **North**	**367**
Northeast	**359**
Connecticut	32
Maine	58
Maryland	36
Massachusetts	2
New Hampshire	6
New Jersey	78
New York	56
Pennsylvania	91
North Central	**8**
Indiana	1
Michigan	5
Minnesota	1
Ohio	1
b. **South**	**141**
Southeast	**112**
Florida	26
Georgia	41
North Carolina	1
Virginia	44
South Central	**29**
Arkansas	3
Louisiana	25
Mississippi	1
c. **Pacific Coast**	**16**
California	6
Oregon	10
d. **Rocky Mountain**	**3**
Colorado	1
Idaho	1
Nevada	1
e. **United States**	**527**

[3]*A more detailed discussion of state forest practice regulation can be found in Siegel, W.C. 1990. Legislative Regulation of Private Forestry Practices in the United States—Recent Developments. In: Forestry Legislation, Report of IUFRO Working Party S4.08-03, Zurich, Switzerland, p. 349-364.*

Local governments in the northeast traditionally have exhibited a greater degree of local autonomy than those in other regions, primarily because of greater constitutional and statutory grants of authority than elsewhere. This is one reason for the large number of forestry ordinances found in northeast states. Another is the traditional structure of local government in the region. Townships, towns, villages, boroughs and municipalities serve as the fundamental form of local government, with counties usually providing only an auxiliary function. Of the 359 local units of government in the northeast identified as having forest-related ordinances, 90% were at less than the county level (table 3).

In contrast, the county is the prevalent unit of local government in the South. Nearly 9 of every 10 ordinances (87%) in the South were enacted at the county level (table 3).

Intent and Provisions of Local Regulation

Regulatory Intent

The local government ordinances identified in this study can be distinguished largely by their regulatory intent. Most contain an introductory statement that outlines the purposes for enactment. These statements provide insight into the attitudes and motivations of the governmental unit and its citizens.

The legislative intent of ordinances differs dramatically in scope among states and regions. Most ordinances have several stated objectives. Each ordinance, however, can be placed into one of five categories, according to its primary objective. The categories are: public property protection, tree protection, special feature protection, environmental protection, and timber harvesting.

Table 3.—Level of local government enacting forest-related ordinances, and number of local governments enacting one, two, and three ordinances, by RPA region.

Region	County govt.	Municipal govt.	One ordinance	Two ordinances	Three ordinances
a. **North**	**38**	**329**	**314**	**25**	**1**
Northeast	36	323	306	25	1
North Central	2	6	8	0	0
b. **South**	**123**	**18**	**129**	**6**	**0**
Southeast	94	18	106	3	0
South Central	29	0	23	3	0
c. **Pacific Coast**	**6**	**10**	**14**	**1**	**0**
d. **Rocky Mountain**	**3**	**0**	**3**	**0**	**0**
e. **United States**	**170**	**357**	**460**	**32**	**1**

Table 4.—Number of forest-related ordinances enacted in the United States, by objective, time adopted, and RPA region.

Region and time adopted	Public property	Tree protection	Special feature	Environ protection	Timber harvest	Total
a. **North**						
Before 1983	0	24	14	20	43	101
1983 to 1987	3	10	7	15	65	100
After 1987	1	15	43	31	76	166
Total	**4**	**49**	**64**	**66**	**184**	**367**
b. **South**						
Before 1983	8	2	1	2	0	13
1983 to 1987	23	6	0	5	4	38
After 1987	28	3	43	12	4	90
Total	**59**	**11**	**44**	**19**	**8**	**141**
c. **Pacific Coast**						
Before 1983	1	0	0	0	1	2
1983 to 1987	0	0	0	1	6	7
After 1987	0	2	0	2	3	7
Total	**1**	**2**	**0**	**3**	**10**	**16**
d. **Rocky Mountain**						
Before 1983	0	0	0	0	0	0
1983 to 1987	0	0	0	0	0	0
After 1987	0	0	0	2	1	3
Total	**0**	**0**	**0**	**2**	**1**	**3**
e. **U.S.**						
Before 1983	9	26	15	22	44	116
1983 to 1987	26	16	7	21	75	145
After 1987	29	20	86	47	84	266
Total	**64**	**62**	**108**	**90**	**203**	**527**

Public Property Protection Ordinances

These ordinances generally are enacted to protect the local government's investment in roads, bridges, ditches, and rights-of-way, by placing restrictions on the use of logging vehicles and machinery. A common secondary objective is to protect motorists from potentially hazardous driving conditions. Typical provisions include harvesting permits and plans, mandatory inspections of operations, removal of mud and debris from roads and ditches, the use of gravel mats at entrances to public roads, and restrictions against use of roads during stated hours and weather conditions.

Tree Protection Ordinances

These ordinances are associated primarily with the preservation of trees and wooded areas in urban and suburban settings. They govern the removal of one or more trees on private land. Unlike timber harvesting ordinances, tree protection ordinances generally have not been enacted to regulate commercial forestry operations per se. Rather, they have been adopted generally to regulate tree removals associated with land clearing and development activities. They affect commercial timber harvests by restricting the removal of large groups of forest trees for any purpose within the regulated area. Common provisions include harvesting permits, site plans, and replanting requirements.

Special Feature Protection Ordinances

These are ordinances enacted for the specific purpose of protecting designated areas because of their scenic or environmental value. The ordinances rarely encompass all forest areas within a local government's jurisdiction. Examples of designated protection zones include scenic river corridors, shoreline and coastal areas, recreational districts, viewsheds, and critical habitat areas for threatened and endangered species. Common requirements include harvest permits, management plans, and leaving buffer zones. Many special feature protection ordinances limit the volume of timber that can be removed from a regulated area, while others prohibit forestry activities altogether.

A recent regulatory trend has resulted in the enactment of many special feature protection ordinances in the states of Maine (24 ordinances), Maryland (13 ordinances), and Virginia (40 ordinances) in the past 5 years. The state governments in these three states have passed laws that establish minimum standards and mandate that local units of government enact ordinances to protect environmental features that are either of great size or common to many local governments—the Chesapeake Bay in Maryland and Virginia, and inland freshwater shorelands in Maine.

Environmental Protection Ordinances

The primary intent of these ordinances is to protect the general environment from "land disturbing activities." Most are zoning codes, or ordinances primarily intended to control stormwater drainage or erosion and sedimentation. However, their wording is such that silvicultural operations, timber removal, and forest road construction qualify as regulated activities. Harvest permits, erosion control plans, leaving buffer zones, and restrictions on harvest methods are common regulatory provisions. This type of ordinance also is used to regulate the use of prescribed burning and herbicides.

Timber Harvesting Ordinances

These ordinances were enacted to directly regulate silvicultural and timber harvesting operations. Their stated purpose generally is to limit site degradation and environmental damage associated with commercial forestry activities. Protection of forest resources, and conservation of esthetic values and wildlife habitat, were two primary reasons stated by the governments enacting this type of law. Common requirements include timber harvesting permits, harvest and management plans, leaving buffer zones, restrictions on silvicultural practices, and standards for road construction and maintenance. Both timber harvesting and environmental protection ordinances often include provisions to waive requirements if operations are supervised by a professional forester or done under a management plan approved by the state forestry agency.

Distribution by Category

Timber harvesting ordinances were the most numerous of the five categories, accounting for 39% of all local ordinances (table 4). Special feature and environmental protection ordinances each represented about one-fifth of the total (20% and 17%, respectively). The remaining one-fifth was evenly divided between public property and tree protection ordinances (12% each, table 4).

The northeast states dominated the count in all categories of ordinances except public property protection. More than nine-tenths (92%) of public property ordinances were enacted by local governments in the South RPA region; only a few (5%) were found in the North (table 4).

Regulatory Provisions

Together, northeast states and the South accounted for nearly all (95%) local forest-related ordinances. Analysis of the ordinances in these areas identified nine regulatory provisions that were used with at least moderate frequency, and an additional five provisions that were somewhat less common.

Harvest or Haul Permits.—Two-thirds (69%) of local ordinances in the northeast states and one-third (34%) in the South required permits to harvest or haul timber products. Permit fees typically ranged between $10 and $50, but occasionally exceed $100 in the South. Some harvest permit fees in northeast states are based on the number of acres harvested; in the South, a few ordinances set haul permit fees according to the distance traveled on county roads.

Forest Management Plans.—Just under two-thirds (62%) of ordinances in northeast states and one-seventh (14%) in the South require that forestry activities be carried out under the provisions of a written forest management plan prepared by a professional consulting forester. Some also require that biologists, hydrologists, or archaeologists participate in the review process.

Buffer Zones.—Buffer zone requirements were found in about two-fifths (43%) of local ordinances in northeast states and one-tenth (9%) in the South. Buffers are most commonly required along watercourses, property lines, roads, and drainage facilities. The required buffer width ranges from 15 to 150 feet. In most cases, buffers must be left in their natural state. Some ordinances, however, allow limited harvesting.

Best Management Practices.—Two-fifths (38%) of local ordinances in the South and nearly one-tenth (7%) in northeast states required forest operators to adhere to voluntary state Best Management Practices (BMPs). BMPs usually are adopted to minimize erosion and sedimentation associated with forest roads and harvesting and skidding timber. Common provisions include specifications for waterbars and residual forest stocking, protection of streamside management zones, and reseeding roads after a harvest.

Performance Bonds.—Approximately one-third (35%) of local ordinances in northeast states and one-fifth (21%) in the South required loggers or timber haulers to provide surety bonds, performance bonds, or irrevocable letters of credit. Although extremely large bonds are mandated in some instances, most ranged from $200 to $5,000.

Bridges and Culverts.—One-third (34%) of ordinances in northeast states and one-fifth (18%) in the South stipulate that bridges and culverts must be used for stream crossings. Typically, the bridges and culverts are to be removed after harvest, and the site must be restored to its original condition.

Logging Slash Reduction.—Nearly one-third (31%) of the ordinances in northeast states contained logging slash and debris provisions. Most specify that logging slash can be placed no closer than 50 feet from any watercourse, road, or property line, and can be no more than 4 feet high.

Harvests by the Selection Method.—One-fourth (25%) of local ordinances identified in northeast states limit timber harvests to the selection method. Most such ordinances expressly prohibit clearcutting. Definitions of clearcutting vary widely, but in most cases openings are not to exceed one-fifth acre in size. Other related provisions often found in these ordinances require fixed percentages of residual forest stock to be maintained after a harvest.

Debris-Clearing Requirements.—One-fourth (24%) of the ordinances identified in the South require forest operators to clear mud and logging debris from public roads and drainage facilities.

Less commonly used in forest-related ordinances in northeast states and South were requirements to notify local officials before harvesting or hauling timber, to install gravel pads and culverts at entrances to public roads, to discontinue hauling operations on given days, at given times, or under given weather conditions, and to hold a public hearing before being granted a harvest permit.

Shifts in the Nature of Local Regulation

The past 10 years also have seen a significant change in the type of forest-related ordinances that

local governments enact. There has been a shift away from public property and tree protection ordinances, which have a relatively minor impact on private timber harvests, toward special feature protection, environmental protection, and timber harvesting ordinances, which have a greater impact.

The shift is most noticeable in the North RPA region, where the proportion of ordinances in the last three categories grew from three-fourths (76%) among ordinances enacted before 1983, to nine-tenths (90%) among ordinances enacted after 1987 (table 4). However, it also is occurring in the South, where the proportion in the last three categories increased from one-fourth (23%) among ordinances enacted before 1983, to two-thirds (66%) among ordinances enacted after 1987 (table 4).

Current Effect of State and Local Regulation on Private Timber Harvests

North

Respondents to the Delphi procedure survey estimated that, in the North RPA region, state water quality regulation currently causes a 1% reduction in private harvests of hardwood timber products and a 1% to 2% reduction in harvests of softwood products (table 5). State endangered species regulation was estimated to cause an additional 1% reduction in harvests of hardwood sawtimber, but appeared to have no effect on harvests of other products (table 5).

The respondents credited the reforestation requirements of some state forest practice acts in the region with increasing timber harvests from nonindustrial private lands by 2% for hardwood products and 1% for softwood. However, these increases were at least partially offset by reductions in harvests from forest industry land. The net result was an estimated 2% increase in hardwood product harvests, and no change in softwood product harvests (table 5). County and municipal regulation was estimated to cause an additional 1% reduction in harvests of all types of timber products (table 5).

State endangered species regulation and county and municipal regulation appeared to have a greater effect on nonindustrial private than forest industry lands (table 5). Respondent comments during the survey indicated this is because nonindustrial holdings tend to be located closer to population centers than industry land, and because nonindustrial owners are more likely to abandon a timber sale out of frustration over regulatory processes.

Table 5.—Median estimates of the current effect (in percent change) of state and local regulation on private timber harvests in the North, by type of regulation, species and product group, and ownership class.

	All private forest lands	Forest industry	Nonindustrial private
a. State Water Quality Regulation			
Hardwood Pulpwood	-1	-1	-1
Hardwood Sawtimber	-1	-1	-1
Softwood Pulpwood	-1	-1	-1
Softwood Sawtimber	-2	-2	-2
b. State Endangered Species Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	-1	0	-1
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
c. State Forest Practice Regulation			
Hardwood Pulpwood	+2	-1	+2
Hardwood Sawtimber	+2	0	+2
Softwood Pulpwood	0	-3	+1
Softwood Sawtimber	0	-3	+1
d. County and Municipal Regulation			
Hardwood Pulpwood	-1	-1	-1
Hardwood Sawtimber	-1	-1	-1
Softwood Pulpwood	-1	-1	-1
Softwood Sawtimber	-1	-1	-2
e. Total Effect			
Hardwood Pulpwood	-1	-2	-1
Hardwood Sawtimber	-1	-3	-1
Softwood Pulpwood	-3	-5	-2
Softwood Sawtimber	-3	-6	-3

Note: Figures may not sum to total because of rounding

The net effect of state and local regulation on current private timber harvests in the North was an estimated 1% reduction in harvests of hardwood products, and a 2% reduction in harvests of softwood products (table 5). As might be expected, the survey results indicated that most of the effect occurs in northeast states, where regulation is concentrated.

South

Survey respondents in the South RPA region estimated that state water quality regulation currently causes a 1% reduction in private harvests of both hardwood and softwood timber products (table 6). State endangered species regulation was estimated

to reduce harvests of softwood products by an additional 1%, but appeared to have little effect on hardwood product harvests (table 6). Respondent comments indicated that most of the effect of endangered species regulation results from uncertainty; forest owners are hesitant to conduct forest practices because they don't want to risk breaking a law.

The respondents saw no current effect on private timber harvests from state forest practice regulation (table 6). They estimated that county and municipal regulation causes a uniform 1% reduction in harvests of all products (table 6).

In this region, state and local regulation appeared to affect forest industry holdings more than nonindustrial private (table 6). Respondents suggested this is because industry holdings are large and easy to identify, and because firms have a substantial stake in the success of voluntary BMP programs, so they ensure they are in compliance.

Table 6.—Median estimates (in percent change) of the current effect of state and local regulation on private timber harvests in the South, by type of regulation, species and product group, and ownership class.

	All private forest lands	Forest industry	Nonindustrial private
a. State Water Quality Regulation			
Hardwood Pulpwood	-1	-2	-1
Hardwood Sawtimber	1	-2	-1
Softwood Pulpwood	1	-1	-1
Softwood Sawtimber	-1	-1	-1
b. State Endangered Species Regulation			
Hardwood Pulpwood	0	-1	0
Hardwood Sawtimber	0	-1	0
Softwood Pulpwood	1	-1	-1
Softwood Sawtimber	-1	-1	-1
c. State Forest Practice Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	0	0	0
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
d. County and Municipal Regulation			
Hardwood Pulpwood	-1	-1	-1
Hardwood Sawtimber	-1	-1	-1
Softwood Pulpwood	-1	-1	-1
Softwood Sawtimber	-1	-2	-1
e. Total Effect			
Hardwood Pulpwood	-3	-4	-3
Hardwood Sawtimber	-3	-4	-2
Softwood Pulpwood	-3	-4	-2
Softwood Sawtimber	-3	-4	3

Note: Figures may not sum to total because of rounding.

The combined effect of state and local regulation in the South was an estimated 3% reduction in harvests of all timber products (table 6). Survey results indicated that the effect of state water quality regulation is concentrated in southeast states, while the effect of state endangered species regulation is concentrated in the south central states.

Pacific Coast

The survey results clearly indicated that state and local regulation has its greatest impact on private timber harvests in the Pacific Coast region. State water quality regulation was estimated to reduce current harvests of hardwood and softwood pulpwood by 2%, hardwood sawtimber by 3%, and softwood sawtimber by 4% (table 7). State endangered species regulation was estimated to reduce harvests of hardwood products by 1% or less, softwood pulpwood by 2%, and softwood sawtimber by 6% (table 7). State forest practice regulation was estimated to reduce harvests of hardwood and softwood pulpwood by 2%, hardwood sawtimber by 3%, and softwood sawtimber by 2% (table 7).

In most Pacific Coast states, the forest-related water quality and endangered species regulations are included in the state forest practice act. To avoid double-counting, we asked respondents in the region to focus on the effects of the water quality and endangered species sections of the acts as we covered them in the questionnaire, and to factor those effects out of their responses for forest practice regulation. The results for the three types of state regulation followed a similar pattern. All indicated that nonindustrial private lands are more affected than forest industry by the aspects of state regulation that restrict harvests of softwood sawtimber (table 7).

There was no observed effect on private timber harvests as a result of county and municipal regulation (table 7). Respondent comments during the interviews indicated this is because the comprehensive state acts common to the region restrict the ability of counties and municipalities to pass independent enactments.

The combined effect of state and local regulation on current private timber harvests in the Pacific Coast region was an estimated 4% reduction in hardwood pulpwood harvests, a 7% reduction in hardwood sawtimber harvests, a 6% reduction in softwood pulpwood harvests, and a 12% reduction in softwood sawtimber harvests (table 7).

Rocky Mountain

Respondents in the Rocky Mountain region estimated that state water quality regulation currently has no effect on private harvests of hardwood products, but reduces softwood pulpwood harvests by 1% and softwood sawtimber harvests by 3%. The effect is concentrated on forest industry lands (table 8). The respondents observed no effect on timber harvests from state endangered species regulation or forest practice regulation (table 8). However, they estimated that county and municipal regulation causes a 2% to 3% reduction in harvests of hardwood products, with the effect focused entirely on nonindustrial private holdings near urban areas (table 8).

In all, state and local regulation was estimated to cause a 3% reduction in current private harvests of hardwood pulpwood in the Rocky Mountain region, a 2% reduction in hardwood sawtimber harvests, a 1% reduction in softwood pulpwood harvests, and a 3% reduction in softwood sawtimber harvests (table 8).

Table 7.—Median estimates of the current effect (in percent change) of state and local regulation on private timber harvests in the Pacific Coast region, by type of regulation, species and product group, and ownership class.

	All private forest lands	Forest industry	Nonindustrial private
a. State Water Quality Regulation			
Hardwood Pulpwood	-2	-2	-1
Hardwood Sawtimber	-3	-3	-3
Softwood Pulpwood	-2	-2	-1
Softwood Sawtimber	-4	-4	-5
b. State Endangered Species Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	-1	-1	-1
Softwood Pulpwood	-2	-3	-2
Softwood Sawtimber	-6	-5	-7
c. State Forest Practice Regulation			
Hardwood Pulpwood	-2	-2	-2
Hardwood Sawtimber	-3	-3	-3
Softwood Pulpwood	-2	-2	-2
Softwood Sawtimber	-2	-2	-3
d. County and Municipal Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	0	0	0
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
e. Total Effect			
Hardwood Pulpwood	-4	-4	-4
Hardwood Sawtimber	-7	-7	-7
Softwood Pulpwood	-6	-6	-6
Softwood Sawtimber	-12	-10	-14

Note: Figures may not sum to total because of rounding.

Table 8.—Median estimates of the current effect (in percent change) of state and local regulation on private timber harvests in the Rocky Mountain region, by type of regulation, species and product group, and ownership class.

	All private forest lands	Forest industry	Nonindustrial private
a. State Water Quality Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	0	0	0
Softwood Pulpwood	-1	-3	-1
Softwood Sawtimber	-3	-5	-1
b. State Endangered Species Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	0	0	0
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
c. State Forest Practice Regulation			
Hardwood Pulpwood	0	0	0
Hardwood Sawtimber	0	0	0
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
d. County and Municipal Regulation			
Hardwood Pulpwood	-3	0	-3
Hardwood Sawtimber	-2	0	-2
Softwood Pulpwood	0	0	0
Softwood Sawtimber	0	0	0
e. Total Effect			
Hardwood Pulpwood	-3	0	-3
Hardwood Sawtimber	-2	0	-2
Softwood Pulpwood	-1	-3	-1
Softwood Sawtimber	-3	-5	-2

Note: Figures may not sum to total because of rounding.

Level of Enforcement and Likelihood of Additional Regulation

Level of Enforcement

The question on how fully regulation was being enforced did not produce useable results. Many regulatory programs achieve high levels of compliance through voluntary participation, while others are enforced only on a complaint basis or with identified "bad actors." As a result, respondents' answers to this question ranged the full scale from 0% to 100% for most states. Respondents who placed the current or anticipated enforcement levels substantially below 100% almost uniformly cited limited agency funding as the reason.

Likelihood of Additional Regulation

Answers to the question on the likelihood that additional regulation would be passed in the future were coded in five categories:

0% to 19% = Very Low

20% to 39% = Less-Than-Even

40% to 59% = Even

60% to 79% = Better-Than-Even

80% to 100% = Very High

The median responses varied from state to state. In general, however, respondents in the North placed high probabilities on passage of additional state water quality and endangered species regulation, but lower probabilities on passage of additional state forest practice regulation or county and municipal regulation (table 9). The specific type of regulation most frequently mentioned was legislation to identify and protect critical wildlife habitat. Respondents from northeast states that already have substantial municipal-level regulation frequently predicted that additional municipalities would pass ordinances. Respondents from north central states often predicted passage of comprehensive state forest practice acts, modeled after those presently in place in northeast states.

In the South, respondents placed the likelihood of additional regulation of all types at better-than-even or higher (table 9). Most respondents believed that some form of state BMPs, currently voluntary, would be made mandatory. Many also predicted passage of additional county-level timber harvesting ordinances, particularly at the fringes of urban growth areas.

Respondents in the Pacific Coast region considered chances for additional regulation better-than-even or higher at the state level, but less-than-even at the local level (table 9). Again, most Pacific Coast states have comprehensive forest practice acts that limit the ability of counties and municipalities to pass independent enactments. Most frequently mentioned in this region were revisions to the state forest practice acts to address the cumulative effects and old growth issues.

In contrast to their peers elsewhere in the United States, respondents in the Rocky Mountain region—the region with the lowest level of state and local regulation—did not consider the probability for additional regulation of any type higher than even (table 9).

Future Effect of State and Local Regulation on Private Timber Harvests

In the North, respondents anticipated that reductions in private harvests of hardwood products attributable to state and local regulation would increase sharply over the next 10 years, from the present 1%- level to 10% or more (tables 5 and 10). They also predicted that regulation-induced reductions in private softwood harvests would roughly triple over the period, from 3% to 8% to 9% (tables 5 and 10). More stringent state water quality regulation was expected to be the principal cause of the changes, followed by state endangered species and county and municipal regulation (tables 5 and 10).

Table 9.—Median estimates of the likelihood that additional regulation will be enacted within the next 10 years, by type of regulation and region.

	North	South	Pacific Coast	Rocky Mountain
State Water Quality Regulation	V High	V High	> Even	Even
State Endangered Species Regulation	> Even	V High	V High	V Low
State Forest Practice Regulation	< Even	> Even	V High	Even
County and Municipal Regulation	< Even	> Even	< Even	< Even

Note: V Low = 0% to 19% likelihood;
< Even = 20% to 39% likelihood;
Even = 40% to 59% likelihood;
> Even = 60% to 79% likelihood;
V High = 80% to 100% likelihood.

Respondents in the South also expected state and local regulation to cause broad and substantial reductions in private timber harvests. They predicted that harvests of both hardwood and softwood products would decline an additional 10% or more, from the current 3% level to 13% to 16% (tables 6 and 10). They attributed most of the anticipated change to increased state endangered species regulation, followed by state water quality and county and municipal regulation (tables 6 and 10).

In contrast, Pacific Coast respondents expected no further change in harvests of hardwood products (tables 7 and 10). They predicted that state endangered species and forest practice regulation would cause additional reductions in softwood harvests, however, from 6% to 8% for softwood pulpwood, and from 12% to 16% for softwood sawtimber (tables 7 and 10).

Table 10.—Median estimates of the future effect (in percent change) of state and local regulation on private timber harvests in the United States, by type of regulation, species and product group, and region.

	North	South	Pacific Coast	Rocky Mountain
a. State Water Quality Regulation				
Hardwood Pulpwood	-6	-7	-2	0
Hardwood Sawtimber	-8	-6	-3	0
Softwood Pulpwood	-4	-3	-2	-2
Softwood Sawtimber	-4	-4	-4	-3
b. State Endangered Species Regulation				
Hardwood Pulpwood	-4	-5	0	-1
Hardwood Sawtimber	-5	-6	-1	-1
Softwood Pulpwood	-2	-7	-3	0
Softwood Sawtimber	-3	-9	-7	0
c. State Forest Practice Regulation				
Hardwood Pulpwood	+3	0	-2	0
Hardwood Sawtimber	+2	0	-4	0
Softwood Pulpwood	0	0	-2	0
Softwood Sawtimber	+1	0	-4	0
d. County and Municipal Regulation				
Hardwood Pulpwood	-3	-2	0	-3
Hardwood Sawtimber	-3	-2	0	-2
Softwood Pulpwood	-2	-3	0	0
Softwood Sawtimber	-3	-3	0	0
e. Total Effect				
Hardwood Pulpwood	-10	-14	-4	-4
Hardwood Sawtimber	-13	-15	-7	-3
Softwood Pulpwood	-8	-13	-8	-2
Softwood Sawtimber	-9	-16	-16	-4

Respondents in the Rocky Mountain region predicted that state water quality and endangered species regulation would cause an additional 1% decrease in the harvests of all timber products, from the current 1% to 3% level to 2% to 4% (tables 8 and 10).

The findings in this section may be considered tentative. They required a high level of speculation, and respondents' answers varied over a wide range. But they clearly suggest two main points. Respondents expect that, within the next several years, regulation-induced decreases in private timber harvests will reach or exceed the 10% level for the most important timber products in all but the Rocky Mountain region. Also, there is a high level of concern within the forestry community about current regulatory trends.

Projected Effect of State and Local Regulation on Timber Supply and Price

Effect on Private Timber Supply

TAMM projections made using the Delphi survey results indicate that state and local regulation should cause only slight changes in private supply of hardwood products, but can be expected to have a marked effect on the supply of softwood sawtimber products.

Private supply of hardwood non-sawtimber products[4] is projected to stay within 1% of the baseline supply level, in all regions, over the entire projection period (table 11). Supply of hardwood sawtimber products is projected to remain within 4% of the baseline level (table 12). In the North, projected supply of hardwood non-sawtimber products remains slightly above the baseline through the year 2040, largely offsetting below-baseline supply projected for sawtimber products (tables 11 and 12). In the South, projected supply of hardwood products averages nearly 20 million cubic feet per year above the baseline, marking an apparent shift from softwood to hardwood products (tables 11 and 12). Regulation is projected to have no additional effect on hardwood product supply in the Pacific Coast or Rocky Mountain regions (tables 11 and 12).

[4]TAMM model output combines pulpwood, chemical wood, and fuelwood into a category titled "non-sawtimber products;" it combines sawtimber, plywood peeler logs, and such miscellaneous industrial products as poles, piling, posts, mine timbers and cooperage into a category titled "sawtimber products."

Table 11.—Projected effect of state and local regulation on annual supply (in million cubic feet) of hardwood non-sawtimber products from private forest lands, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	2213	2709	3105	3498	3836	4276
Projected Harvest Including Regulation	2213	2718	3125	3536	3868	4298
Estimated Effect of Regulation	—	9	20	38	32	22
Percent	—	0%	1%	1%	1%	1%
b. South						
Baseline Projected Harvest	1719	2279	2705	2771	2929	2983
Projected Harvest Including Regulation	1719	2281	2709	2779	2929	2976
Estimated Effect of Regulation	—	2	4	8	0	-7
Percent	—	0%	0%	0%	0%	0%
c. Pacific Coast						
Baseline Projected Harvest	108	160	188	209	246	252
Projected Harvest Including Regulation	108	160	188	209	246	252
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%
d. Rocky Mountain						
Baseline Projected Harvest	13	11	20	28	41	49
Projected Harvest Including Regulation	13	11	20	28	41	49
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%

Table 12.—Projected effect of state and local regulation on annual supply (in million cubic feet) of hardwood sawtimber products from private forest lands, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	1126	1079	1057	1049	1051	1073
Projected Harvest Including Regulation	1126	1065	1028	1014	1012	1030
Estimated Effect of Regulation	—	-14	-29	-35	-39	-43
Percent	—	-1%	-3%	-3%	-4%	-4%
b. South						
Baseline Projected Harvest	1006	1200	1388	1537	1627	1730
Projected Harvest Including Regulation	1006	1209	1406	1560	1651	1747
Estimated Effect of Regulation	—	9	18	23	24	17
Percent	—	1%	1%	1%	1%	1%
c. Pacific Coast						
Baseline Projected Harvest	98	126	136	154	146	151
Projected Harvest Including Regulation	98	126	136	154	146	151
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%
d. Rocky Mountain						
Baseline Projected Harvest	1	0	0	0	0	0
Projected Harvest Including Regulation	1	0	0	0	0	0
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%

State and local regulation also is projected to raise private supply of softwood non-sawtimber products slightly above the baseline level through the projection period. In the North and South, softwood non-sawtimber supply is projected to exceed the baseline by up to 2%, for an average of roughly 12 million cubic feet per year (table 13). Projected supply in the Pacific Coast and Rocky Mountain regions ranges as high as 6% above baseline, for an average of just under 3 million cubic feet per year (table 13). These figures appear to indicate another shift, from large to small softwood products.

In contrast, regulation is projected to push private supply of softwood sawtimber products well below the baseline level. The effect is concentrated in the South and Pacific Coast regions. In the South, supply of softwood sawtimber products is projected to average 15%, or 605 million cubic feet per year, below the baseline through the year 2040 (table 14). Supply in the Pacific Coast region is projected to average nearly 3%, or 40 million cubic feet per year, below the baseline (table 14). Some production is projected to shift to the North and Rocky Mountain regions; but total projected supply of softwood sawtimber products remains between 360 and 814 million cubic feet per year below the baseline level (table 14).

Effect on U.S. Timber Supply

Tables 15 and 16 show, respectively, projected annual U.S. supply of hardwood and softwood sawtimber products. Close comparison with tables 12 and 14, which show projected annual private supply, reveals that the volume estimates for the effect of regulation are virtually identical between the two sets of tables. This indicates that timber buyers cannot expect the effect of regulation on private timber supply to be moderated by increased harvests from public forests. Instead, it is projected to pass essentially unchanged to timber markets (tables 12, 14, 15, and 16).

Effect on Stumpage Prices

The TAMM model results indicate that, in addition to diminished overall timber supply, state and local regulation can be expected to generate real increases in timber stumpage prices. Tables 17 and 18 show, respectively, projected average stumpage prices for hardwood and softwood sawtimber products, expressed in constant 1982 dollars. Prices of all sawtimber products are projected to rise sharply by the year 2000, to between 15% and 25% above the baseline level (tables 17 and 18). Hardwood sawtimber prices in the North and South are projected to continue rising relative to the baseline until 2010, then begin reapproaching baseline prices at the rate of one or two percentage points each decade (table 17).

Projected prices of softwood sawtimber products do not follow a common pattern. In the North, they are projected to begin slowly reapproaching the baseline price level after the year 2000 (table 18). In the South, they are projected to continue rising relative to baseline prices until about 2010, then stabilize at 15% to 17% above the baseline (table 18). In the Pacific Coast region, softwood sawtimber prices are projected to remain some 20% above the baseline through the end of the projection period (table 18). In the Rocky Mountain region, they are projected to continue rising relative to the baseline beyond the year 2010, then stabilize at 25% to 30% above baseline prices (table 18)

CONCLUSIONS

State and local regulation of private forest practices has increased dramatically over the past 10 years. At the state level, the water quality laws in about one-fourth of the 50 states specifically regulate forest operations, while those of the remaining states are written broadly enough to cover forestry by implication. Forty-four states have passed endangered species legislation augmenting federal law, and 21 states regulate forest practices.

Regulation at the county and municipal level has increased more than four-fold in the past 10 years, from 116 enactments before 1983, to 527 enactments in 1992. These local enactments differ widely in their stringency and their potential effect on timber supply. Each, however, can be placed into one of five categories according to its regulatory objective: public property protection, tree protection, special feature protection, environmental protection, and timber harvesting. Most local regulation in the North RPA region has been enacted at the municipal level, and most regulation in the South at the county level.

Table 13.—Projected effect of state and local regulation on annual supply (in million cubic feet) of softwood non-sawtimber products from private forest lands, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	513	707	867	965	999	985
Projected Harvest Including Regulation	513	709	873	980	1017	997
Estimated Effect of Regulation	—	2	6	15	18	12
Percent	—	0%	1%	2%	2%	1%
b. South						
Baseline Projected Harvest	1995	2250	2354	2681	3123	3525
Projected Harvest Including Regulation	1995	2251	2357	2739	3126	3526
Estimated Effect of Regulation	—	1	3	58	3	1
Percent	—	0%	0%	2%	0%	0%
c. Pacific Coast						
Baseline Projected Harvest	264	345	437	479	565	631
Projected Harvest Including Regulation	264	347	460	481	564	629
Estimated Effect of Regulation	—	2	23	2	-1	-2
Percent	—	1%	5%	0%	0%	0%
d. Rocky Mountain						
Baseline Projected Harvest	33	33	49	65	87	91
Projected Harvest Including Regulation	33	35	50	66	86	92
Estimated Effect of Regulation	—	2	1	1	-1	1
Percent	—	6%	2%	2%	-1	1%

Table 14.—Projected effect of state and local regulation on annual supply (in million cubic feet) of softwood sawtimber products from private forest lands, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	296	374	423	421	415	406
Projected Harvest Including Regulation	296	378	429	430	425	408
Estimated Effect of Regulation	—	4	6	9	10	2
Percent	—	1%	1%	2%	2%	0%
b. South						
Baseline Projected Harvest	2546	3312	3439	4419	4686	4374
Projected Harvest Including Regulation	2546	2975	2967	3654	3873	3736
Estimated Effect of Regulation	—	-337	-472	-765	-813	-638
Percent	—	-10%	-14%	-17%	-17%	-15%
c. Pacific Coast						
Baseline Projected Harvest	2066	1503	1339	1324	1449	1911
Projected Harvest Including Regulation	2066	1463	1275	1310	1401	1877
Estimated Effect of Regulation	—	-40	-64	-14	-48	-34
Percent	—	-3%	-5%	-1%	-3%	-2%
d. Rocky Mountain						
Baseline Projected Harvest	359	356	311	244	277	327
Projected Harvest Including Regulation	359	369	340	288	314	342
Estimated Effect of Regulation	—	13	29	44	37	15
Percent	—	4%	9%	18%	13%	5%

Table 15.—Projected effect of state and local regulation on annual U.S. supply (in million cubic feet) of hardwood sawtimber products, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	1233	1198	1179	1174	1179	1203
Projected Harvest Including Regulation	1233	1184	1150	1139	1140	1160
Estimated Effect of Regulation	—	-14	-29	-35	-39	-43
Percent	—	-1%	-2%	-3%	-3%	-4%
b. South						
Baseline Projected Harvest	1054	1245	1433	1583	1674	1776
Projected Harvest Including Regulation	1054	1254	1452	1606	1698	1794
Estimated Effect of Regulation	—	9	19	23	24	18
Percent	—	1%	1%	1%	1%	1%
c. Pacific Coast						
Baseline Projected Harvest	140	152	162	180	172	177
Projected Harvest Including Regulation	140	152	162	180	172	177
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%
d. Rocky Mountain						
Baseline Projected Harvest	4	4	4	5	5	5
Projected Harvest Including Regulation	4	4	4	5	5	5
Estimated Effect of Regulation	—	0	0	0	0	0
Percent	—	0%	0%	0%	0%	0%

Table 16.—Projected effect of state and local regulation on annual U.S. supply (in million cubic feet) of softwood sawtimber products, 1990 through 2040, by decade and region.

	1990	2000	2010	2020	2030	2040
a. North						
Baseline Projected Harvest	334	416	475	476	471	463
Projected Harvest Including Regulation	334	421	482	484	482	466
Estimated Effect of Regulation	—	5	7	8	11	3
Percent	—	1%	1%	2%	2%	1%
b. South						
Baseline Projected Harvest	2766	3413	3645	4630	4903	4593
Projected Harvest Including Regulation	2766	3177	3172	3865	4089	3956
Estimated Effect of Regulation	—	-336	-473	-765	-814	-637
Percent	—	-10%	-13%	-17%	-17%	-14%
c. Pacific Coast						
Baseline Projected Harvest	3459	2282	2134	2124	2255	2711
Projected Harvest Including Regulation	3459	2242	2071	2113	2201	2679
Estimated Effect of Regulation	—	-40	-63	-11	-54	-32
Percent	—	-2%	-3%	-1	-2%	-1%
d. Rocky Mountain						
Baseline Projected Harvest	861	777	745	694	740	807
Projected Harvest Including Regulation	861	789	776	740	783	824
Estimated Effect of Regulation	—	12	31	46	43	17
Percent	—	2%	4%	7%	6%	2%