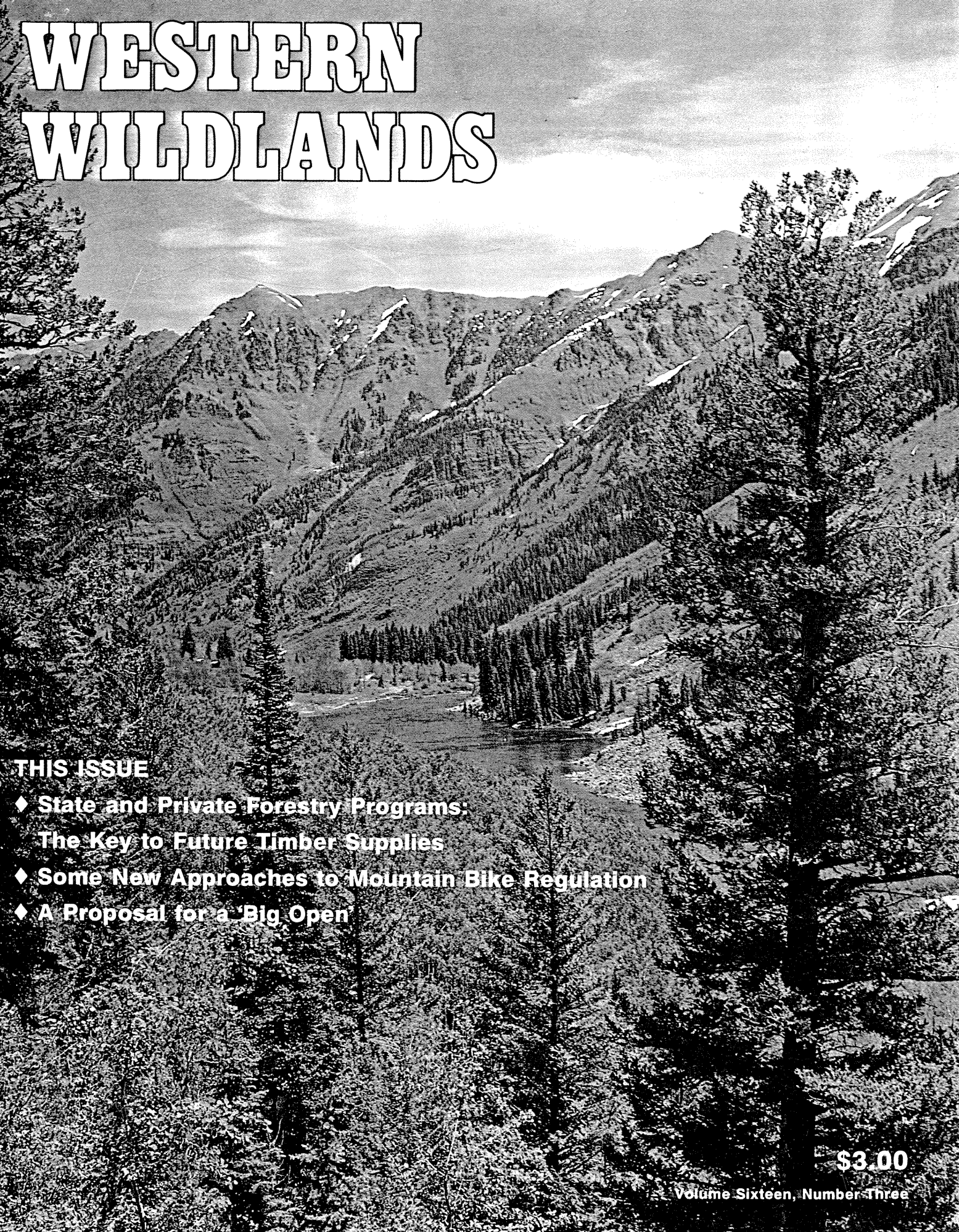
# WESTERN WILDLANDS



THIS ISSUE

- State and Private Forestry Programs: The Key to Future Timber Supplies
- Some New Approaches to Mountain Bike Regulation
- A Proposal for a 'Big Open'

$3.00

Volume Sixteen, Number Three

# WESTERN WILDLANDS
## A NATURAL RESOURCE JOURNAL

VOLUME 16
NUMBER THREE, FALL 1990

EDITOR
Jennifer O'Loughlin


COVER PHOTO

*Maroon Bells*
*Snowmass Wilderness, Colorado*
**Photo/Larry Ridenhour**




WESTERN WILDLANDS is published quarterly by the Montana Forest and Conservation Experiment Station, University of Montana. The magazine assumes no responsibility for the statements and opinions expressed by contributors. All correspondence should be sent to the Editor, Western Wildlands, School of Forestry, University of Montana, Missoula, Montana 59812. Telephone: (406) 243-6655. Manuscripts or black-and-white photographs sent for consideration are welcome. The subscription rate is $12 per year. Single issues, when available, are $3.00. Second-class postage paid at Missoula, Montana.

POSTMASTER: Send address changes to WESTERN WILDLANDS, School of Forestry, University of Montana, Missoula, MT 59812-1201.

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION

Sidney S. Frissell, Station Director

The Montana Forest and Conservation Experiment Station was established by the Montana State Legislature in 1937 as a nonprofit organization devoted to scientific investigation of natural resource problems. The station serves as the research unit of the University of Montana School of Forestry with the Dean functioning as station director. The station seeks, through this magazine and other publications, to enhance public understanding of forestry and conservation and contribute to wise use of our nation's forest, water, range, wildlife and recreation resources.

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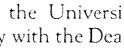

## ISSUES: State and Private Forestry



## TOPICS

# Non-Industrial Private Forests: Timber Supply for an Uncertain Future

Ralph J. Alig

According to U.S. Forest Service estimates (in press), annual timber harvest volume in the United States will have to increase from the 18 billion cubic feet of 1986 to 27 billion cubic feet by 2040 to satisfy increasing demand (Figure 1). It's doubtful that public forest lands can provide much of this additional timber, primarily because of increasing calls for reduction of timber harvest on national forests to accomodate other uses of the forests. Large forest industry companies manage their forests for timber production, but they do not own enough land to sustain the projected harvest increases. Thus, the major increases in U.S. timber harvest will probably have to be met by the remaining forests — those held by non-industrial private owners.

Non-industrial private forest land produces about two-thirds of all timber harvested annually in the Untied States (Table 1). Non-industrial private landowners control about three-fifths of U.S. timberland and about half of the national timber inventory. Much of the land they control is or could be highly productive. Non-industrial and forest industry land, which together produced about four-fifths of the 1987 U.S. timber harvest, are the country's largest timber producers. The two types of private forest land produce roughly equal volumes of softwood and together produce three-quarters of the total softwood harvest. The non-industrial lands also produce about three-quarters of the hardwood harvest volume. However, because the acreage in non-industrial private forests is larger than that controlled by the forest industry, the former has considerably higher aggregate net annual growth. This article explores the potential for increased timber growth and harvest on non-industrial private forest lands.

*Photo/U.S. Forest Service*

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Because of their importance, non-industrial private forest (NIPF) owners have often been the subjects of forest production and policy research. For those who hoped such studies would lead to simple conclusions and formulas for action, the results have been disappointing. In essence, they show that NIPF owners are not much different from other Americans. The main thing that sets them apart is the fact that they own forest land. They are heterogeneous, and only general and qualified observations can be made about them as a group:

- Their characteristics and their forest holdings vary widely both within and across regions.

**Ralph J. Alig** *was project leader for the economics unit of the U.S. Forest Service Southeastern Forest Experiment Station and is now a research forester with the agency's Pacific Northwest Experiment Station. He assisted with the RPA assessment of supply and demand for timber by modeling and projecting land use and forest type changes in the United States.*

**Table 1**

**Percentage of timberland, inventory, and harvest by ownership, 1986.**

| Ownerships | Timberland Area | Inventory | | | Harvest | | |
|---|---|---|---|---|---|---|---|
| | | All Species | Soft-wood | Hard-wood | All Species | Soft-wood | Hard-wood |
| | Percent | | | | | | |
| National Forest | 18 | 28 | 42 | 8 | 13 | 17 | 4 |
| Other Public | 10 | 12 | 12 | 10 | 6 | 7 | 5 |
| Forest Industry | 15 | 14 | 16 | 12 | 30 | 38 | 17 |
| Farmer & Other Pvt | 57 | 46 | 30 | 70 | 51 | 38 | 74 |

- Their forest management intentions and activities vary within and across regions.
- Many are absentee owners.
- They are older, on average, then the general population.
- Their land changes hands frequently; even when it doesn't, the intentions of individual owners often change over the length of a timber rotation.
- Many NIPF owners do not cite timber production as a primary land management goal.

From the standpoint of future timber supplies, the key questions about NIPF owners have to do with tree planting, intermediate treatment and harvesting.

Particularly in the southern United States, with its shorter rotations and relatively high productivity, planting conifers goes a long way toward assuring that a piece of land will provide valuable timber at some time in the future. That is one reason for state and federal incentives encouraging private landowners to establish conifer plantations. Government programs to encourage tree planting have included the Forestry Incentives Program, the Agricultural Conservation Program and various state and federal tax incentives and cost-sharing initiatives.

Research shows that increases in reforestation costs reduce the probability that NIPF owners will plant trees; conversely, programs that reduce reforestation costs encourage owners to plant trees. For example, NIPF owners respond well to cost-sharing programs for tree planting (Alig et al. 1990). NIPF owners planted millions of acres to trees between 1950 and 1988 (Figure 2); planting activity peaked from 1957 through 1962 and 1986 through 1988. The earlier period coincides with the Soil Bank Program and the later with the Conservation Reserve Program associated with the 1985 Farm Bill.

A number of studies have shown that stumpage prices have little or no effect on NIPF owners' decisions about reforestation. However, these studies made use of regional price data, and regional averages do not always reflect the prices that individual landowners received or were offered for their timber. There is also some question whether current or lagged prices accurately represent NIPF owners' expectations about returns from investments in forestry. The returns from tree planting investments would be so far in the future that it is understandable if landowners' decisions about reforestation are not strongly affected by current prices.

Intermediate stand treatments such as thinning could profitably increase yields on more than 20 million acres of NIPF land (U.S. Forest Service, in press). Follow-up treatments are needed even on land planted under cost-sharing programs: Alig et al. (1980) and Kurtz et al. (1980) found that more than one-third of the stands planted under the Agricultural Conservation Program and the Soil Bank Program needed thinning to correct overstocking or prevent the spread of disease.

There has been little research on NIPF owners' decisions about investment in intermediate stand management. Two state-level studies suggest that owner characteristics and management objectives are more important than expected stumpage prices in this regard (Boyd 1984, Holmes 1986) The studies found that tract size was positively and significantly correlated with the decision to apply intermediate treatments — the bigger the tract, the greater the likelihood of treatment. One study found that there was a significant correlation between knowledge of cost-sharing opportunities and use of intermediate timber treatments (Boyd 1984); the other did not, finding instead significant correlation with use of technical forestry assistance (Holmes 1986). Stumpage price, income and occupation did not correlate significantly with decisions to apply intermediate treatments. Correlations between decisions to apply intermediate treatments and education, previous harvest activity and concerns about wildlife and recreation were significant and positive.

In the absence of definitive information, it may be fair to assume that landowners' attitudes toward intermediate stand treatments are similar to their attitudes about tree planting. If so, financial incentives and technical assistance might encourage them to apply treatments. Whether the public is willing to provide those incentives is open to question, however.

Timber harvesting on NIPF land contributes to short-term timber supplies, and harvesting methods that produce better residual stands can also increase future timber supplies (Moulton and Cubbage 1990). Again, firm conclusions about market responses are limited. However, it is generally agreed that increases in stumpage prices can lead to increased harvesting on NIPF land, although increases in timber prices do not appear to result in proportional increases in timber harvesting. Studies linking increased harvesting to high stumpage prices should be interpreted cautiously because regional price data are used to represent actual revenues to landowners.

Public technical assistance to landowners was the government program that most obviously affected NIPF

harvesting. Technical assistance is funded by the states and the federal government and is provided through state-employed service foresters.

In the Northeast and Southeast, owners with higher incomes are less likely than others to harvest timber. Perhaps people with high incomes are more likely to own land for purposes other than timber production.

Tract size strongly influences the practicality of forest management activities, and subdivision of tracts to create vacation properties can increase property maintenance costs and reduce harvesting. Smaller parcels are less likely to be harvested than larger ones. Farmers respond more strongly than other non-industrial landowners to timber prices and are thus more likely to harvest NIPF land.

The major U.S. forest regions have widely different potential to attract private investments in timber production. Rapid tree growth generally translates into higher potential returns to investors, and tree growth is fastest in the South and the wetter areas of the Pacific Northwest. Growth rates are impressive in some parts of the Northeast, but high land values and high potential profits from land subdivision tend to discourage forestry investments in that region. Rapid tree growth, large areas of marginal cropland that could be planted to tress and proximity to major wood-processing facilities make the South the most important area for increases in NIPF timber production.

About three-quarters of the private land that could economically be planted to timber or produce more timber is in the South (U.S. Forest Service 1988, in press). Growth could be increased, with acceptable financial returns, on more than 80 million acres of private timberland in the South, and more than 20 million acres of marginal agricultural land could be planted to trees. The total acreage involved is equivalent to more than one-fifth of all U.S. timberland. Most of these opportunities are found on non-industrial private forest land; if all were realized, aggregate growth of softwoods could increase by about 40 percent of net U.S. softwood growth in 1986, although the additional increments of timber would be spent over several decades.

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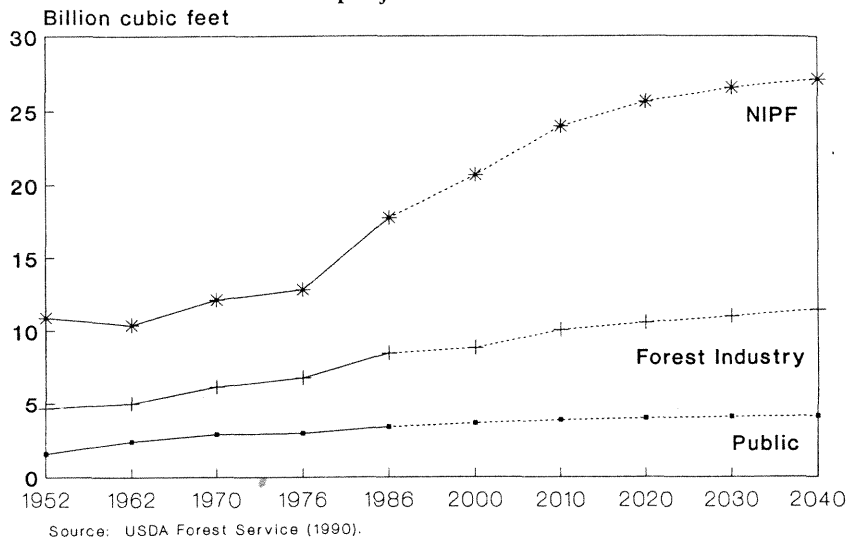
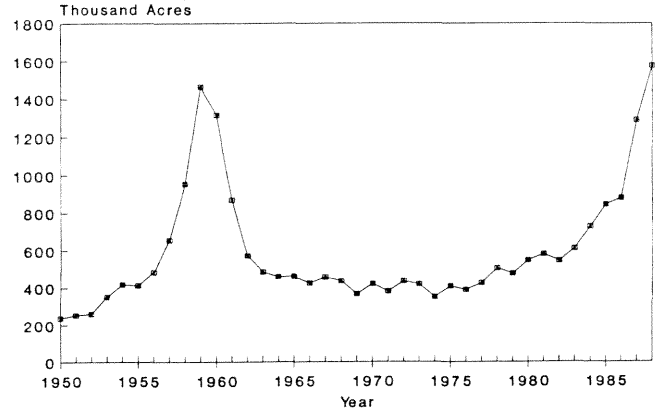
Despite considerable research on NIPF owners, it's become apparent that they are so diverse that it will never be possible to predict their behavior with certainty. It's also doubtful whether researchers will ever be able to accurately forecast their responses to financially attractive opportunities for investments in additional timber growing. Nevertheless, some general conclusions can be made:

**Figure 1**
**Timber harvest in the U.S. by ownership class, 1952-1987 with projections to 2040**




Source: USDA Forest Service (1990).

**Figure 2**
**Nonindustrial private forest planting, 1950-1988.**




Source: Analysis of Timber Situation, USDA Forest Service; Annual Planting Reports, USDA Forest Service

- Increases in stumpage prices increase the likelihood of timber harvesting on NIPF land.
- NIPF owners have responded to financial incentives to plant trees. The Soil Bank Program and the Conservation Reserve Program stimulated sharp increases in NIPF planting rates, particularly in the South.
- NIPF owners typically do not invest in intermediate treatments that could improve existing timber stands. They might respond to financial incentives like those provided for tree planting.
- Major increases in timber production are most likely to occur in the South if management options to increase timber-growing productivity are implemented. NIPF owners will largely determine the size of those increases.

Obviously the potential for increased timber production on NIPF land, especially in the South, is enormous. Government incentives programs have and can continue to encourage NIPF owners to grow and harvest more trees. If NIPF owners continue to increase harvsting and planting, they could reduce some timber supply pressure on pubic timberlands, particularly in the West. However, the timing and type of additional timber increments should be carefully examined when considering the future outlook.

*Photo/U.S. Forest Service*

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