ECONOMICS OF FOREST PRACTICE REGULATION IN CALIFORNIA

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Abstract. Attempts were made recently to revise California forest practice regulations to, among other things, require the use of culmination of mean annual increment to specify minimum harvest age, and promote non-economic values at the expense of economic ones. Changes that were proposed are analyzed in terms of future timber output levels, incentives to invest in forest management, regional employment and income levels, tax revenues, and regional and global environmental quality. The social merits of preserving additional areas of old-growth or late-seral forest are also discussed.

INTRODUCTION

California has long had the strictest regulation of private timber harvesting in the nation, but efforts by environmentalist groups to make it even stricter have greatly intensified in recent years. With the failure of ballot initiatives, focus was placed on changing the forest practice rules of the State Board of Forestry by re-interpreting the intent of the 1973 California Forest Practice Act to deemphasize timber production in favor of non-market values. The Act states that the intent of the legislature was to assure that the "goal of maximum sustained production of high-quality timber is achieved while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment."

FUTURE TIMBER SUPPLY IN CALIFORNIA

Pressure for intensification of forest practice regulations came partly from arguments that the private lands of California were not on a "sustained yield basis". This led the Board of Forestry, initially, to consider rules that would restrict annual average harvest levels to a certain percentage of growth (such as 110 percent) or of standing volume (such as 3 percent).

The California Timber Supply model was developed to project future levels of private timber inventory, harvest and growth (Krumland and McKillop 1987, 1989 and 1990a). It combines a distance-independent individual-tree growth and yield simulator (CATSYG) with a linear programming module (CATSLP). Results obtained in 1987 were referred to as Scenario Two in the Forest and Rangeland Resources Assessment Program (FFRAP) report of the California Department of Forestry and Fire Protection (1988).

Scenario One was FFRAP's own analysis using the CATSYG growth and yield simulator, partly under the assumption that increased regulation would occur. It projected significantly lower future levels of growth and harvest than Scenario Two and was used by environmentalist groups to argue that there was a need to increase regulation of forestry practices. This argument ignored the fact that Scenario One, because it assumed increased regulation would take place, could not be used as a basis for arguing that increased regulation was necessary.

Private lands, in the aggregate, were on a sustained yield basis for each major region of the state before recent demands for increased regulation. Krumland and McKillop (1990a) said "prospects for maintaining recent (1978-85) levels of private timber harvest in California are good, provided that future forest practice regulations are not significantly more restrictive than at present". It is important to recognize that a major part of California logging in the 1940's and 1950's took place on nonindustrial lands because they were closer to highways and markets. Therefore, timber companies turned increasingly to their own lands as a source of logs. From a timber productivity point of view, it is unfortunate that most nonindustrial lands were selectively harvested rather than being clearcut and replanted. Selective harvesting allowed tanoak and other species of inferior timber value to displace high value species such as pines, redwood and Douglas fir. Nevertheless, region-by-region, the nonindustrial lands will be able to provide enough coniferous timber in the coming years to maintain private timber output at recent levels while timber inventories are rebuilding on industrial lands.

From a timber supply point of view, it makes no sense to require so-called sustained yield on individual properties or classes of owners, as was initially proposed. It is counterproductive to do so because it will lead to lower levels of future timber output. Age-class structure varies significantly among individual ownerships and classes of

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ownership in California. Imposition of harvest flow constraints on individual management units and ownerships will give a lower level of aggregate output for a region than would occur in the absence of such constraints.

EFFECT OF PROPOSED OLD-GROWTH AND LATE SERAL RULES

An initial proposal was made to the Board of Forestry that owners be required to set aside 10 percent of their property with old-growth timber characteristics. This proposal was clearly counterproductive to the goal of maximum sustained production because mature timber stands generally have the highest volume per acre and the slowest growth rates. If owners were denied the right to harvest an area of this high-volume, slow-growing component of their timber base they would have been forced to harvest several times that area of faster-growing younger stands to make up for the loss in harvest volume.

FINANCIAL IMPACTS OF OLD-GROWTH AND LATE SERAL RULES

Attempts were made to use the concept of opportunity cost to imply that harvest delays imposed by proposed rules would not have a major financial effect on landowners. Estimates of so-called opportunity cost were simply estimates of financial losses that proposed rule changes would impose on landowners. True opportunity cost is value foregone when the owner of a resource chooses voluntarily to undertake one course of action rather than another.

Numerical estimates of losses were provided in early drafts of rule changes but they were not meaningful, primarily because of the use of incorrect interest rates for discounting future revenues. The principal numerical example in the proposed old-growth/late-seral rules package related to a 20 acre tract of old-growth redwood where 4 acres could not be harvested because they were in a watercourse protection zone. Harvest was to be delayed for 5 years on approximately 25 percent of the volume on the other 16 acres, and for 25 years on the remaining volume on the 16 acres. The example used a 4.5 percent interest rate, along with a 0.5 percent annual volume growth rate and a price increase of 3 percent per year. The interest rate has very little allowance for risk. However, if environmentalist pressures continue to grow in California, the probability of being able to harvest old-growth redwood 5 or 25 years in the future is very low. So the interest rate should have been 10 percent at the very least for such a risky venture. With this rate of interest, the financial loss to the owner of the 20 acre tract would be $800 thousand for the delay in harvest, plus another $800 thousand for the watercourse restriction, for a total loss of $1.6 million, i.e. $80,000 per acre. This represented a taking of 40 percent of

the current value of the standing timber. Even if the 4 acres in the watercourse protection zone were ignored, the delay of harvest represented a 25 percent taking of the value of the timber on the other 16 acres, equivalent to $50,000 per acre. Landowners, of course, wanted to know exactly what societal values were to be protected at a cost to them of $50,000 or $80,000 per acre.

EFFECTS ON HARVEST LEVELS

The average cut of conifers from all private lands in the state over the 1978-91 period was 2.2 billion board feet. The 1990 California Timber Supply model projected an average cut of 2.1 billion per year in the coming decades (Krumland and McKillop, 1990). It was estimated on the basis of later studies that the reduction in cut due to the rules that were initially proposed could be as much as 30 percent, i.e. more than 600 million board feet per year (McKillop and Krumland, 1990b). This estimate was supported by examination of analyses by two timber companies, one in the Northern Interior and one in the North Coast, which showed that the cumulative impacts of the various new rules, as initially proposed, would reduce harvest levels between 30 and 50 percent per year.

IMPACTS ON EMPLOYMENT AND INCOME

A reduction in annual cut of 600 million board feet per year would amount to a loss of 3600 jobs and $90 million in annual payrolls in the timber industry alone, using 6 timber jobs per million board feet at $26,000 per year.

When that is expanded to the regional economy through the multiplier effect, the reduction would have resulted in a total employment loss of 7,200 jobs, and a total annual payroll loss of $150 million. Even if the least extreme combination of rule changes caused only a 10 percent drop in cut, that would still result in a loss of 2,400 jobs and $50 million in annual payrolls. These losses would have been a severe blow to rural communities in Northern California, coming on top of devastating losses due to paralyzation of the U.S. Forest Service timber sale program, and property damage from recent fires. These estimates do not include effects due to reduction in harvests from nonindustrial ownerships.

Sacrificing jobs now will not result in future gains in employment. There are substantial quantities of young-growth timber that will come on-stream in the future, especially on the North Coast. From an employment point-of-view, the important thing at the moment, is to maintain the current harvest level of more mature age-classes while young-growth inventories are building up, and while the U.S. Forest Service is trying to re-establish its timber sale program.
WILDLIFE

It is commendable to be concerned about protecting wildlife species which are truly threatened or endangered, but it appears that landowners are being asked to give up scarce timber resources for a range of wildlife species which are not in those categories, and whose identity and habitat needs are not made clear.

Resources have value because they are scarce relative to human needs. Specific, scientific information on exactly what types of wildlife habitat are in scarce supply at the present time should be required before policy changes are considered. As noted above, there are vast areas of undisturbed habitat in parks, wilderness, reserved areas and non-timber forest types in California. Again, the phenomenon that is in scarce supply, is not wildlife habitat, but productive forest land on which timber harvesting is permitted.

It is necessary to retain a balanced perspective even with respect to species listed as endangered, threatened or sensitive. For example, the U.S. Fish and Wildlife Service listing of the Northern Spotted Owl as threatened has had far-reaching consequences for both private and public timber management activities. However, the Chairman of the Interagency Scientific Committee has stated that the ISC recommended to the U.S. Fish and Wildlife Service that the Northern Spotted Owl not be listed in California (Thomas, 1992). Because of the Fish and Wildlife Service’s decision to ignore that recommendation, very large volumes of timber are being tied up on private lands, in addition to the virtual shut-down of the U.S. Forest Service timber sales program in the Northern Spotted Owl region.

WATER QUALITY

It is proper to require reasonable protection of water quality. However, in adopting rules to provide this protection, policy makers should not be misled by claims of water quality degradation attributed to timber operations conducted decades ago under old rules. They should consider only scientific evidence on effects of logging and road construction that has taken place under rules that have been adopted since 1973, including significant revisions in early 1992.

A report to the California Water Resources Control Board (1987) provides useful information on whether there is a need for further revision of watercourse rules. The report noted that out of the 100 sites that were selected “with possible water quality effects”, practices “adequately protected natural resources at sixty-one of the sites visited”. At the remaining sites visited, the “majority of (adverse) effects appeared to be minor” and “at some sites the effects were rated as moderate to major, and at very few sites they were rated as severe”. The report later states that the “majority of adverse effects .... appeared to be minor. A substantial minority of adverse effects were rated as moderate, and a few were rated from major to severe”. This report preceded the recently adopted water quality rules and there appears to be no evidence that the new rules are inadequate.

Discrimination, in the proposed rules, against even-aged management systems in general, and against clear-cutting in particular, may well be counter-productive with regard to water quality because the proposed reduction in clear-cut size to 30 acres for cable-logging will discourage that type of harvesting, and, together with a reduction of clear-cut size to 20 acres for tractor-logging, will require an increase in the amount of roads that must be open and operable at any one time.

CONCLUSION

Wood processing companies own only 2.8 million acres of timber forest in California, and only about 1.5 million acres of other private land are seriously given over to the growing and harvesting of timber. We can no longer be sure that the California National Forests can make a meaningful contribution towards meeting our need for wood products. To meet this need, we can count on only about 4 million acres of private land out of a total of 20 million acres of public and private land in the state that are biologically capable of producing significant amounts of wood products.

It is environmentally irresponsible for Californians not to maintain a viable forest economy in the state, and to provide a reasonable share of our wood products consumption. Currently, California produces only about 35 percent of its needs for lumber, paper, paperboard and other wood products; and that percentage will drop rapidly as our population grows.

Recycling and careful use will help to some extent, but one effect of reducing timber output levels in California is that we will turn increasingly to substitute materials like steel and concrete that cause much more pollution and use much more energy in their manufacture (Bowyer, 1991; Koch, 1991).

The main effect, however, is that California will import more wood from other regions, particularly Canada. As a result, Canada will ship less lumber to Japan and other Asian countries. They, in turn, will increase their wood purchases from tropical forest regions or boreal forest regions such as Siberia, where fragile ecosystems are not protected in the strict way that we already do in California with our current forest practice regulations.
EFFECTS ON FOREST INVESTMENT

Major features of silvicultural rule changes, as initially proposed, were the increasing of residual volumes after partial cutting and the requirement that trees could not be harvested until culmination of mean annual increment had occurred. The proposers of these requirements ignored the facts that:

(1) culmination of MAI is meant to apply to even-aged stands, not to uneven-aged stands or to individual trees

(2) the objective of maximum production would be thwarted if regulations were to make timber growing uneconomic on specific sites and timber types

(3) broad-brush dependence on yield tables for regulatory purposes, and failure to make proper allowance for species mix, stand history or stand density for individual stands would require elaborate and costly administrative procedures to verify compliance.

(4) if stands are harvested at financially optimal rotation lengths rather than biologically-based rotations, capital is made available for increasing the intensity of forest management

(5) maximum sustained production will be achieved only if forest landowners are given an adequate rate of return on their capital assets, so that they will be encouraged to invest in forest management activities and to keep their land in timber production

With regard to the two latter points, an analysis was done of the financial feasibility of reforesting, with Ponderosa pine, a 3,000 acre tract of average site quality in Northeastern California that had been recently destroyed by fire. The financially optimal rotation length was about 50 years. Cumulation of mean annual increment (MAI) in board feet would result in a rotation of 150 years and a present net worth that was $177 per acre less than the financial optimum. The analysis used a 7 percent real interest rate and real price rises of 2 percent per year for the first 20 years, 1 percent for the following 20 years and zero percent thereafter.

Culmination of MAI in cubic feet would result in a rotation of 75 years and a present net worth that was $67 per acre less than the financial optimum. However, proponents of the CMAI rule were interested in forcing rotations to be as long as possible and argued that the legislative desire for "high-quality timber" mandated maximization of MAI in board feet. If the Board of Forestry had followed that direction there would have been some interesting debate on whether "high-quality" products are those whose cost of production exceeds their market value. (The high-quality phrase was inserted in the 1973 Act to prevent low-grade hardwoods being used to meet minimum restocking standards following logging).

SOCIAL MERITS OF OLD-GROWTH LATE SERAL RULES

To have social value, most goods or services must be in scarce supply whether they be aesthetic or material in character; market or nonmarket, tangible or intangible, monetary or nonmonetary. Otherwise we would consume them or enjoy them to the point of satiation.

Let us examine the degree to which late seral forest types are in scarce supply in California.

We have 19.7 million acres of nontimber forest types in California which provide substantial levels of aesthetic, environmental and recreational benefits. Because we try to exclude wildfire from these areas, much of them are in late seral stages or moving towards that condition.

In California, there are 2.9 million acres of timber forest (capable of producing timber crops) reserved in parks and wilderness areas, including 250 thousand acres or more of the redwood forest type, of which 80 thousand acres or more is old growth.

On the California National Forests, there are 168.5 billion board feet of standing volume on 9.3 million acres of lands that are capable of producing timber. If we exclude wilderness and specially protected areas, there are 152.9 billion board feet on 7.9 million acres of capable and available lands. If we exclude lands which the U.S. Forest Service deems unsuitable for timber harvesting, there are 95.5 billion board feet on 5.3 million acres of capable, available and suitable (CAS) lands.

We should note that management for timber will probably play only a minor role on about half of the 5.3 million acres of CAS lands just mentioned, especially since the U.S. Fish and Wildlife Service has designated 1.2 million acres of California National Forests as critical habitat for the Northern Spotted Owl. So, in addition to the 20 million acres of nontimber forest types in California, there are almost 7 million acres of National Forest lands, capable of producing timber, that will be managed to provide mainly nontimber benefits. Most of these acres will be in old-growth or late seral forest.

So we should ask, where is the scarcity? The answer is that the phenomenon that is in scarce supply in California, is not late seral forest, but productive forest land on which timber harvesting is permitted.
LITERATURE CITED


