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***How to Get Less Timber and  
Less Wilderness at the Same Time***

**Wasting  
Our  
National Forests**

**Thomas M. Lenard**

**I**N RECENT YEARS, increasing prices for wood products have focused attention on serious deficiencies in the way we manage our national forests. The increases have greatly exceeded the general inflation rate and have been a recurring problem in every expansion of housing construction since the late 1960s. Moreover, in coming years the demographic boom in housing demand will run up against the cyclical low point in timber production from private lands. Clearly, the problem will become worse, soon, unless new supplies are developed.

The obvious place to look for expanded timber production and relief from excessively high wood prices is the national forests. They contain over half of the nation's softwood sawtimber—the most important raw material for residential construction—but provide less than a quarter of the annual output. (In contrast, the private forest industry, which controls only

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16 percent of the softwood sawtimber inventory, accounts for some 38 percent of wood production.) The strikingly low output from the national forests is caused mainly by the rigid adherence of the U.S. Forest Service to key policies that preclude efficient production. If the long-feared "timber famine" finally comes, it will in large measure be the result of poor management of public lands, not of alleged cut-and-run practices of private landowners.

The Forest Service has been severely criticized, from seemingly opposite standpoints, by both the timber industry and the environmentalists. However, the conflict between these two interests obscures a crucial point: the nation could have more timber *and* more wilderness if the constraints on efficient production were removed. Rational economic management would permit the production of more wood on less land, freeing large areas of national forest land for wilderness, recreation, and other purposes. Ironically, then, the present defective policies may be as harmful to environmental

concerns as they are to the needs of the timber and housing industries.

### **Inefficiency and Controversy**

Congress has recorded its intention, albeit somewhat ambiguously, that the national forests be managed with due regard for economic efficiency. Not only do the governing statutes contain numerous statements to this effect, but they also specifically call for a balancing of costs and benefits in national forest management—language that is conspicuously absent in many other areas of government activity. Despite this legislative intent, the results of Forest Service policy can scarcely be held up as a model of efficiency. Marion Clawson estimated several years ago that, if reasonable capital charges were assessed against the immense value of their resources, the national forests incurred annual shadow losses of \$2 billion, even when noncash outputs like wilderness, watersheds, and recreation were generously valued. (The Forest Service ignores capital charges in its own calculations.) Put another way, the national forests earned less than 0.5 percent on their investment.

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Efficiency losses of this magnitude, though not a visible issue in themselves, are clearly at the root of the controversy that surrounds national forest management. And the consequences of these losses—notably, higher wood prices—are both visible and painful. Seeking to relieve the problem, policy makers in Republican and Democratic administrations alike have looked to the national forests as a source of increased timber supplies. But, so far, all that they have managed to do is to generate vigorous opposition from the environmentalists. For instance, in 1973, during a period of rapidly ris-

ing wood prices, the Nixon administration attempted to increase federal timber sales by 1 billion board feet. The effort was halted by a Natural Resources Defense Council lawsuit, on the grounds that no proper environmental impact statement had been prepared. In 1979, during the most recent surge in lumber prices, President Carter directed the secretary of agriculture “to use maximum speed in updating land management plans on selected national forests with the objective of increasing the harvest of mature timber through *departure from the current nondeclining even-flow policy . . .*” (emphasis supplied). This initiative also failed to produce any apparent result. But, as we will see, it correctly focused on the “nondeclining even-flow” policy as the chief obstacle to increasing production.

### **Constraints on Efficiency**

Inefficient management of the national forests is largely attributable to policies that require the maintenance of vastly excessive inventories of mature timber, that misallocate the land between timber and other uses, and that in general preclude meaningful economic calculation in land use planning. By far the most important of these policies is the “nondeclining even-flow” requirement, which arbitrarily limits the timber harvest in any one period and stretches it out for decades beyond the point of economic efficiency. In the process, significant amounts of otherwise useful timber are, in effect, wasted. This policy is perhaps the dominant factor in Forest Service planning.

A second damaging policy is the requirement that stands of timber not be harvested until they “generally have reached the culmination of mean annual increment.” This cumbersome phrase simply means that trees cannot be cut until they reach the age that maximizes average annual growth. It is based on biological criteria and has no economic rationale. For economic purposes, timber should generally be harvested at a much younger age. This requirement is much less important than the “nondeclining even-flow” requirement, because our national forests already contain a large amount of timber that is substantially beyond the “culmination of mean annual increment”—timber that cannot be utilized efficiently because of the

Who would HAVE thought that we would see  
A policy of "spare that tree"  
That would turn out to give us less  
Of Lumber and of Wilderness?



even-flow constraint. If the latter rule is lifted, however, the former will remain as a hindrance to efficient harvesting.

Let us examine these policies—particularly the first—to see how they inhibit not only timber production, but also expansion in wilderness, recreational, and other uses of the national forests.

**“Nondeclining Even-Flow.”** The clearest statement of this policy is from the National Forest Management Act of 1976:

The Secretary of Agriculture shall limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis.

This policy puts a ceiling on the “allowable cut” that can be harvested now, basing it largely on the productivity of the forest at some distant date—perhaps several hundred years—in the future. Once that point is reached, the allowable cut would be no greater than the annual growth in that forest. The Forest Service, which had already been implementing this policy for several years when the 1976 act was passed, is free to depart from it “in order to meet multiple use objectives,” but has never done so.

The adoption of sustained-yield or even-flow forestry as national policy probably stems in part from ancient fears about running out of timber. Such concerns were justified in the Middle Ages, when timber was a common property resource. With no great costs involved, people were tempted to cut too much of the wood for their own use, and thus deplete the forest. Although common ownership of the forests was never a problem in this country, the drawing down of excess timber inventories as the nation developed was (incorrectly) interpreted as evidence that the market would not work in forest land management. This belief contributed to the adoption of sustained-yield principles for managing the national forests. Of course, when timber is a private property resource—as it is in this country, even if much of it is publicly owned—forest owners will have the appropriate incentives to harvest and reforest at socially optimal rates. Indeed, analysis by Peter Berck suggests that private owners act as if they discount the future at a lower rate than is normally available on other invest-

ments, which implies that they have not been harvesting their timber prematurely.

At best (and then only under certain conditions), even-flow principles are suited to just one kind of forest, a forest with a balanced distribution of trees of different ages, from seedlings to mature timber. This is termed a “regulated” forest. Only in this setting can an even-flow policy produce what it is designed to produce—annual harvests equal to annual growth, indefinitely, brought about by cutting mature trees and replacing them with fast-growing young trees.

Vast tracts of the national forests are wholly unsuited to this kind of sustained-yield forestry, because they are not regulated, but rather contain a disproportionate amount of old growth—trees that have essentially reached their maximum volume per acre. Rigid application of the nondeclining even-flow principle is particularly troublesome for such forests. Particularly in the case of mature forests, faster cutting of old growth is needed in order to facilitate new growth and also to convert them more rapidly into regulated forests that can be harvested on a systematic basis. This would increase both present and future yields. The

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problem is that increased harvest in an old-growth forest will necessarily exceed the long-run sustained yield for some period, and this is prohibited by the requirement that there never be a drop-off in the harvest. In the face of the closed-circle policy, the nation is actually forgoing substantial timber supplies now in order to avoid the possibility of a reduction at some distant point in the future—but a reduction that would not necessarily bring future harvests below the levels implied by current policies. It makes no sense at all.

Since the allowable cut is limited by long-run growth (once the forest has reached a regulated state), the harvest of the old growth must be stretched out over a very long period

in order to avoid a decline. This substantially decreases the economic value of the timber. Peter Berck's analysis indicated that holding old-growth timber for fifty additional years on a good site involves a shadow loss of 45 percent of the timber's value, or nearly \$6,000 an acre. If the volume of old-growth timber is larger than can be metered out over time without exceeding the even-flow constraint, substantial losses of usable volume can occur. There is also, of course, an additional physical loss, as insects, disease, fire, and age destroy some of the old standing timber.

The nondeclining even-flow policy has other nonsensical implications. For instance, simply redrawing the boundaries of planning areas so as to combine mature stands with young faster-growing trees would allow increased harvest of the older timber. Where rational management fails, fiddling with a map could succeed! By law, however, the planning areas coincide with the national forests.

To take another example, suppose the Forest Service makes an investment in intensive forestry in an immature timber stand in an area that also contains mature timber. Under nondeclining even-flow reasoning, the investment, which would enhance future yields, allows an immediate increase in the harvest of the mature timber (this is known as the "allowable cut effect"). The increase in current production in the short run is then included in the return on the investment in intensive forestry. Returns on this sort of investment tend to be fabulous. Of course, the availability of mature harvestable timber in this situation has nothing to do with the investment and cannot legitimately be added to the investment return. Moreover, if more rational calculations were used, the investment might not be economically desirable.

An argument often advanced in favor of even-flow management is that a steady harvest of public timber promotes social and economic stability in the surrounding communities. But this claim neglects the fact that many of these communities are also dependent on private timber, which is not provided at a constant rate. For example, the output from private lands in the Pacific Northwest—an area with large amounts of old-growth national forest timber and with substantial mill capacity—is expected to decrease in coming years. But the nondeclining even-flow constraint does not per-

mit increased timber sales from the public lands to offset declines in private harvest.

Similarly, the even-flow idea makes no provision at all for slowing or accelerating the harvest to meet changing market demand. This is particularly relevant at the present time. The arrival of the children of the postwar baby boom at home-buying age has greatly increased the demand for new homes and thus for lumber, a problem that will be exacerbated by the anticipated decline in timber output from private lands. Given fluctuations in market conditions, clearly a steady output of public timber cannot guarantee a secure economic base for communities dependent on timber output, or achieve stable prices for wood products.

Most important, the even-flow requirement does not allow decisions to be based on economically valid calculations of the benefits and costs of alternative forest management plans. Adopting the simplistic idea of a sustained yield institutionalizes this basic shortcoming. What results is rigid and uncomprehending application of policy, when what is needed is flexible and rational management that can respond to ever-changing economic realities.

**"Culmination of Mean Annual Increment."** The other policy in question, also stated in the National Forest Management Act, prohibits the sale of timber from national forests before the stands have reached their maximum average annual growth, or "culmination of mean annual increment." Here, too, the Forest Service is permitted to relax this requirement, but has not done so to any significant extent.

This second policy is conceptually linked to the first. The idea is that when timber reaches the point of its fastest average annual growth, the long-run sustainable yield or allowable cut is the highest possible under the even-flow rules. The purpose of this provision is to maximize the continuous physical output of wood from a given area; all sales are prohibited before this point is reached. Although this constraint is of secondary interest, because large amounts of national forest timber are substantially beyond the culmination of mean annual increment, it provides another example of an inflexible rule devoid of any economic rationale. It also may, for essentially technical reasons, make the nondeclining even-flow constraint more restrictive.

The problem with this policy is that it ignores the time value of money. The way the Forest Service looks at these decisions, it makes no difference whether you harvest a tree now, in fifty years, or in a hundred years. When realistic interest rates are taken into account, however, it does make a difference. Timber reaches its maximum *economic* value—called “economic maturity”—many years before it reaches its maximum average annual growth. Thus, economically rational harvesting uses a much shorter rotation period, often shorter by decades. This is generally the practice in industrial forestry.

The cost of the two policies, as illustrated by John Walker’s analysis of alternative land use plans for the Stanislaus National Forest in California, is large: the approved plan for that forest is costing society \$270 million (see table). In fact, in this example at least, the two constraints make society worse off than if the forest were operated by a profit-maximizing monopolist. These results frustrate the purposes of the Multiple-Use Sustained-Yield Act of 1960, which provides that national forest resources shall be used “in the combination that will best meet the needs of the American people. . . .”

### Wilderness and Development

While it is clear that the policies discussed thwart the efficient production of wood from the national forests, it does not automatically follow that they are unjustified. A case could still be made for them if they sufficiently enhanced other, nontimber outputs—wilderness, wildlife, watersheds, forage, recreation, and so on—and in fact, the Forest Service sometimes defends its practices on these grounds. But no persuasive evidence of this has been advanced. Indeed, the evidence runs the other way. For example, Walker finds “no demonstrable benefits” of that sort to offset the costs of the approved Stanislaus plan. A study by Steven Calish, Roger Fight, and Dennis Teeguarden concluded that waiting for culmination of mean annual increment is not justified by enhancement of nontimber values, and that “economic rotations [harvest at the point of economic maturity] may do a good job of providing for the nontimber benefits. . . .” Clawson

believes that “good management could provide much more of each kind of output,” a subject we turn to now.

Efforts to give wilderness status to national forest areas have provoked heated political dispute and are a source of great uncertainty for the timber industry. At the present time, Congress is considering a bill (S. 842) that would help resolve questions about the status of the 62 million acres of undeveloped national forest land studied for possible wilderness designation in the Agriculture Department’s second roadless area review and evaluation (submitted to Congress in 1979). Decisions on such allocations are often thought to be difficult because, while timber has an identifiable market value, other forest outputs like wilderness are nearly impossible to quantify in dollar terms. But those decisions become easier once it is recognized that, by removing the constraints on efficient timber production, the nation can have more timber and more wilderness at the same time.

One obvious step is to allocate national forest lands according to their greatest value, a step fully justified by the statutes. In practice, however, the policies we have examined are applied to all national forests, with little regard for the great differences among them. The result is that timber harvesting is spread throughout the forests, in spite of convincing evidence that concentrating timber activities in the most productive areas would enhance both economic and environmental values. William F. Hyde’s supply projections for the Douglas fir region of Oregon and Washington, one of

COMPARISON OF ALTERNATIVE PLANS FOR THE STANISLAUS NATIONAL FOREST

Plans	Initial Harvest Levels (hundred thousand cubic feet/yr)	Present Value of Net Social Benefits <sup>a</sup> (\$ millions)
Approved Forest Service Plan	186.5	418.0
Rigid Even-flow Plan <sup>b</sup>	198.1	470.7
Monopolist’s Optimum <sup>c</sup>	260.1	595.4
Social Optimum <sup>d</sup>	442.1	690.8

<sup>a</sup> Based on 6 percent interest rate.

<sup>b</sup> Sets harvests at a level that can be maintained in perpetuity without cutting any stand before “culmination of mean annual increment”; differs from the Forest Service plan mainly in the order in which stands are cut.

<sup>c</sup> Maximizes the present value of the net cash flow accruing to the Forest Service.

<sup>d</sup> Maximizes present value of net social benefits.

Source: John L. Walker, “Land Use Planning Applications of the Economic Harvest (ECHO) Model.”

the most productive timber areas in the country, show that if the present constraints were removed, wood production from public lands could be increased by 74 percent, using 27 percent fewer acres. This would *triple* the amount of forest land in the area on which timber harvesting is not permitted. Hyde concludes: "Efficient timber production is a strong argument for wilderness." It is worth mentioning that a

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change of this sort, increasing both wood production and wilderness, also creates a de facto timber reserve in the wilderness area that may help allay fears that we will run out of timber in the future.

The basic problem, Hyde argues, is that the more productive timber lands are not managed efficiently, while inefficient timber lands are kept in production. Removing the latter from production would result in a net saving to the Treasury, since the cost of production in those areas is greater than the revenues. Moreover, road construction—a major source of environmental damage as well as expense—would be reduced. Finally, as Hyde points out, the less productive areas are often both desirable for recreational purposes and most vulnerable to environmental damage under timber management.

Other investigators have reached similar conclusions. Walker found that by relaxing the constraints on efficient production in the Stanislaus National Forest, more wood could be produced and more land devoted to nontimber uses. Clawson concluded that Forest Service costs exceeded returns on low-productivity sites.

Concern about the timber harvest on low-productivity lands has also been voiced by environmental groups. Kurt Kutay's study of western Oregon showed that a different allocation of Forest Service funds could produce more wood for no increase in cost, and would also allow more roadless land. The Natural

Resources Defense Council has argued that an economic test is required to identify lands "not suited for timber production" (section 6(k) of the National Forest Management Act), and urges that such lands be withdrawn from production. However, that organization stops short of recommending more intensive harvesting of productive sites. Thus, while there are similarities between an economic and an environmentalist point of view, there are also significant differences.

Failure to allocate the land properly is largely attributable to the nondeclining even-flow policy. This policy creates an incentive to keep unproductive lands under harvest, since removing these areas from production would result in an immediate decrease in the allowable cut. It also creates an incentive to overinvest in some areas, on the artificial grounds that such investment, by increasing future yield, offers a greater immediate return in the form of an increased allowable cut. Given the limited Forest Service budget, this propensity to overinvest in some areas naturally leads to underinvestment in other areas where rational economic planning would call for intensified effort. Both over- and underinvestments are magnified by the political necessity of distributing the available funds "fairly" throughout the national forest system. Finally, and most damaging, the policy prevents an accelerated harvest of the vast amounts of mature timber on national forest lands and thus precludes the use of efficient technologies in those areas.

### Some Conclusions

To argue that a fundamental change in national forest policies will provide more of seemingly conflicting outputs is not to say that trade-offs never need to be made. There are, for instance, demands for wilderness in areas where timber production is profitable and promising. There may also be conflicts between mineral development (a subject beyond the scope of this discussion) and other forest uses. When such conflicts arise, decisions should be based on the relative value of the land in its several uses. This, indeed, is what the statutes suggest. The fact that there may be legitimate conflicts concerning the uses of public land makes it all the more important to exploit every opportunity to

remove uneconomic procedures and to make better use of all the potentials of the land.

Although thoroughgoing reform will be difficult to achieve, all that is really required is the application of benefit-cost analysis to Forest Service planning. This would be consistent with the multiple-use principles mandated by Congress and with President Reagan's executive order on federal regulation. There are clearly practical problems in applying benefit-cost analysis to this area, but it could be done—and, if done properly, would take into account both the monetary and nonmonetary values of national forest resources. Its basic purpose would be to ensure that the trade-offs among the various forest resources, and the costs and benefits of alternative management plans, were made explicit. As a benchmark, planners could be required to develop a completely unconstrained management plan. That is, they would ask the question—how would a competitive forest products company manage this land? Then, as constraints were added to take account of nonmonetary values, the cost of those constraints could be identified. The public as well as the officials who set final policy would then have adequate information on which to base their decisions.

It is also important to recognize that the relative values of forest resources, and therefore the optimal use of forest lands, may change over time. For this reason, policy should be flexible. While it is often claimed that wilderness areas preserve options for the future, in fact it is extremely difficult to reverse a wilderness designation once established. The result, unless attitudes toward wilderness areas change drastically in the future, is not to preserve options, but to slam the door on potential productivity from these areas in years ahead. Thus, assigning lands to de facto wilderness status—if that is their best current use—may be a better way to preserve future options.

In a word, more flexibility—more plain common sense, if you will—is the foremost need of national forest management. The problems we have discussed all relate directly to inflexible policies applied in many wholly inappropriate situations. But for this inflexibility, the national forests would provide the nation not only with far more timber, but with more wilderness, recreational areas, and other resources as well. It seems most unfortunate that

we cannot enjoy the full output of the national forests when it is there just for the asking.

Lastly—a point of more than passing interest to the readers of this magazine—there is perhaps a lesson that can be drawn from our

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experience with national forest policies. It is this: Statutory language that specifically encourages economic efficiency and benefit-cost balancing is not enough to produce the desired result. The statutes governing national forest management contain much of the type of language that many would like to see in other regulatory measures. But that has not done the job. It would seem that such statutes must either unambiguously specify economic efficiency as the primary objective, or be administered by people who hold that view. ■

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