

Logging A Roadside Stand To Protect Scenic Values

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ABSTRACT—*A case study on the Challenge Experimental Forest, California, demonstrated that logging along roadsides need not despoil roadside stands. Nearly every tree was "viewed" before marking. Because of the "special-care" procedures followed, combined logging and slash-disposal cost was about twice that of a single-tree selection cut.*

An increasingly outdoor-minded citizenry is becoming highly intolerant of damage to aesthetic values. Its concern for environmental quality is being expressed by well planned, articulate pressure on nearly every level of public and corporate management. Logging, whether on privately owned or public lands, is often bitterly attacked. Thus the forest manager faces what appears to be conflicting demands. On one hand, he must provide forest commodities and boost production to meet growing demands. On the other, he needs to provide the less tangible, yet equally essential benefits of scenic values, pleasing aesthetics and attractive forests.

Logging along roadsides is particularly vulnerable to criticism, but a case study on the Challenge Experimental Forest in north central California demonstrated that logging along roadsides need not despoil roadside stands. Although we removed about a third of the merchantable stems, we believe few travelers would object to the appearance of the residual stand. Indeed, some might find views into the less dense forest more pleasing. Because exacting standards of felling, skidding and slash disposal were followed, the combined logging and slash disposal cost was about twice that of a single-tree selection cut—the most comparable of several cutting operations on the forest. In our opinion the benefits were worth the cost.

Setting

The highway, which passes through the forest, winds

its way across more than 30 miles of timbered land. It is no freeway and should never be. It is asphalt-surfaced, 24 feet wide, has 10 percent maximum grades, and 150-foot minimum radius curves. Prudent speeds range from 20 to 40 miles per hour. The highway climbs from an elevation of 2,300 feet near Challenge to an elevation of over 5,500 feet. In so doing, it passes through at least seven major forest cover types. A traveler can observe vegetation in a wide variety of species, life forms, sizes and age classes. Tree sizes range from stately pines exceeding 60 inches in diameter to delicate seedlings, a few inches high. Tree forms vary from tapering spires to stems gnarled and twisted by struggles for survival. Spatial arrangements of trees are diverse and vary from dense, compact "walls" to isolated trees in large fields of brush. And throughout, the traveler is treated to an ever-changing view from vegetational close-ups to vistas of forest-clad ridgetops, miles away. That the area traversed by the highway is scenic is beyond doubt.

Thus we wanted the portion of highway passing through the Experimental Forest to remain scenic also. But what would people see as they drove through it? We estimated they could easily see about five acres of ground. The amount seen varies tremendously, of course, with the location of the highway relative to topography (ridgetops or valley), highway engineering (curves, cuts and fills), and vegetational characteristics (species, size and spatial arrangements). In this case the highway wound through forested terrain and was constantly changing in elevation. Thus the "near" view ranged from almost nil to more than 300 feet. Nil view portions (especially above road cuts) are not all negative, however; they are handy for debris disposal and temporary log storage.

The tallest vegetation here is mostly of coniferous species—ponderosa pine, sugar pine, Douglas-fir, white fir and incense-cedar. Several hardwood species also are present, chiefly Pacific madrone, bigleaf maple, California black oak, tanoak and dogwood. Though generally an understory component, the hardwoods contribute an extra measure of variability, contrast and beauty to the stand.

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Fig. 1. The limby old incense cedar in the left foreground would be "the first to go" in conventional logging, but was left standing as a pleasing variation in species and life form.

Logging Practices

Before trees were marked for cutting, several key issues on the area in general and how much could be removed while keeping the stand aesthetically pleasing were decided: (1) The area was to remain in timber production; (2) only merchantable or income-producing trees would be harvested in the first cut; (3) the stand already had the diversity of species and age classes necessary for pleasing variability to the traveler; (4) the present stand had too many trees and its productivity could be improved by cutting. Preliminary estimates indicated that about one-fourth of the merchantable volume could be removed. Therefore, every 25 years, about 25 percent of the volume would be cut. Thus the largest trees would be about 175 years old.

Diseased, injured and dying trees were the first to be marked for cutting. From then on, each tree was marked for cutting or reserved, depending upon its individual impact on the "view" (Fig. 1). Here the

trained forester had to modify his thinking from the traditional "even spacing about each tree" to include both even spacing and the deliberate leaving of clumps of trees, to achieve variability in spatial arrangements.

Twenty-two percent of the merchantable volume and 32 percent of the merchantable stems were removed by logging. Cutting caused the proportion of pines in the stand to increase over that of the firs and incense-cedar. This was also true of merchantable volume.

Logging and slash disposal were practiced as an art—the art of minimizing damage to remaining trees and soil, and of eliminating evidence that slash had been disposed of. But the extra care that was taken incurred additional costs.

Each tree was felled where it would cause the least damage, by directing it into a narrow slot between other trees. Keeping trees off the highway was, of course, a must. Occasionally the rubber-tired loader aided felling by pushing against trees leaning over the highway. No stumps higher than 8 inches were permitted—to minimize their being seen. All logs were skidded by a rubber-tired tractor to minimize disturbance to the ground and vegetation. Often, the operator carried the winch line to the log—thus avoiding damage to thickets by keeping the tractor out of them. Whenever tops could be removed without damaging residual trees, they were left on the top-most log, skidded to the landing or log-loading site, and cut off there.

Landings were located out of sight. The three landings in this operation were strategically sandwiched into small openings hidden from the highway. By its very nature, the near view area is often narrow. Locating landings large enough to store a few logs, and to accommodate some slash (tree tops), the loader and at least one logging truck, required careful planning.

After logging had been completed, all cull logs and remaining tops were skidded to the landings and bucked into short lengths. In this typically dense young-growth stand, a few submerchantable trees were inevitably damaged; these trees also were cut, skidded to the landings, and added to the slash accumulation already there. Limbs and smaller slash were hand-piled in small openings hidden from the highway. All piles were carefully burned after heavy autumn rains. Each burning pile was visited on a fixed schedule, and most unburned material was hand fed into the fire. By this close control, more than 95 percent of the slash was eliminated, and no trees were singed.

Costs

Because of the "special-care" procedures used, the combined logging and slash cost of this cutting was about twice that of a single-tree selection cut—the most comparable of several cutting operations on the forest. Hand piling, burning and bunching with a bulldozer averaged nearly \$75 per acre. After converting to a volume basis, the combined logging and slash disposal cost was about \$30 per thousand board feet.

Because of the extra care and costs, roadside cuts are best included as integral parts of large timber sale areas which enable costs to be spread over large volumes or many acres. If the roadside zone is treated as an entity, the logging and slash disposal costs in this study are



Fig. 2. Logging debris from this roadside cut was piled in openings hidden from the highway. A large, burned slash pile lies out of sight behind the maple trees directly in front of the van.

indicative of costs for this type of treatment. Are they worth it?

We believe they are, for the traveler can pass by, appreciate the view, and enjoy the natural-appearing stand (Fig. 2). If they look closely, foresters will see benefits, too. Most of the least healthy trees have been removed and some of the extra trees are gone (Fig. 3). Those remaining now have more space around them, and their growth rate should increase. The proportion of ponderosa and sugar pines in the stand has increased. Thus the growth of the stand at least for the next 25 years will be concentrated on larger, taller stems.

Future Stand Development

But what will be the view of the future traveler? Although cutting opened the view, the stand is likely to close again because of large numbers of hardwoods, chiefly tanoak and Pacific madrone, in the understory. These small hardwoods, along with white fir, are shade-tolerant and grow for years beneath the dominant conifers. A partial cutting creates ideal growing conditions for them. Although not a "takeover" threat to the stand, hardwoods and young fir pose a threat to the future view. They possibly add another expense in the near future for understory thinning.

New regeneration probably will neither increase

stand density nor threaten the view. Because the residual trees are both numerous and of seed-bearing age, a shower of seed from at least one tree species should reach the ground almost every year. Few seedlings should result, however. One reason is that below ground, roots from established trees will soon occupy any space created by cutting. Above ground, branches from existing trees will quickly expand into any new openings. Thus the amount of light, moisture and nutrients available to new seedlings will be minimal.

The species composition of the stand will gradually change. Ponderosa pine will be unable to produce seedlings and, in fact, is not regenerating now. Thus the shade-enduring hardwoods, firs and incense-cedar will gradually replace the pines. This is not necessarily an undesirable process since the species other than pine are aesthetically pleasing, and most of them should enjoy a profitable young-growth timber market in the future.

The age-class distribution of the stand also will change. The majority of larger trees in the stand are now of one age. Continued cutting will lead to a stand of many ages.

An inescapable conclusion from this study is that careful logging can enhance both forestry and the roadside view, thus providing both forest commodities and amenities. □



Fig. 3. A, above, before logging, April 1968. The stand is dark and dense. B, below, after logging, April 1969. Close examination will show that a number of trees were logged.

