



The Economics of Fuel Treatment: Can we Afford to Thin Everywhere?

Key Points:

- Fuel treatment is expensive (and cutting big trees won't pay for it).
- Fuel treatment requires a long-term commitment to maintenance funding.
- Fuel treatment may not reduce fire-fighting costs.
- Wildland fire use is the most cost-efficient way to restore fire to ecosystems.
- Where wildland fire use is unsafe, prescribed fire can substitute for natural fire.

Fuel treatment is expensive (and cutting big trees won't pay for it).

Fuel treatment is the intentional removal of fine fuels (for example, leaf litter, brush) and/or small diameter trees that can carry surface fire to the canopy or the home. It is done for two reasons: to reduce the probability of homes burning and to prepare forests for the reintroduction of fire.

Recent research has shown that the cost of such treatment generally runs from \$500 to \$1500 per acre for mechanical thinning to \$50 to \$500 per acre for prescribed burning. Forest Service researchers have estimated that there

may be as many as 650 million acres that could benefit from some form of fuel treatment.¹ At \$1000 per acre, that amounts to \$650 billion dollars in treatment costs. Even restricting treatment to only the 10 to 20 million acres we estimate to comprise the wildland-urban interface of federal "communities at risk" would still cost \$10 to \$20 billion.

Some have suggested that fuel reduction costs could be covered by selling the trees that are cut in the process. In some cases, costs may be defrayed, but recent history is not promising. On the Cheesman Reservoir-Trumbull Project in Colorado, treatment cost \$728 to \$1085 per acre to remove the logs, compared to \$100 to \$150 per acre to leave the logs on site.² Even the operator lost money. In a recent study in Montana and New Mexico,³ very few cases were found where the value of material removed covered the cost of treatment. In southwestern Oregon, Forest Service scientists estimated that only 17% of acres available for treatment would return a net revenue of zero or greater, even if trees up to 21 inches in diameter could be cut.⁴ Clearly, we can't afford to thin everywhere; we must be strategic about where to spend limited resources.

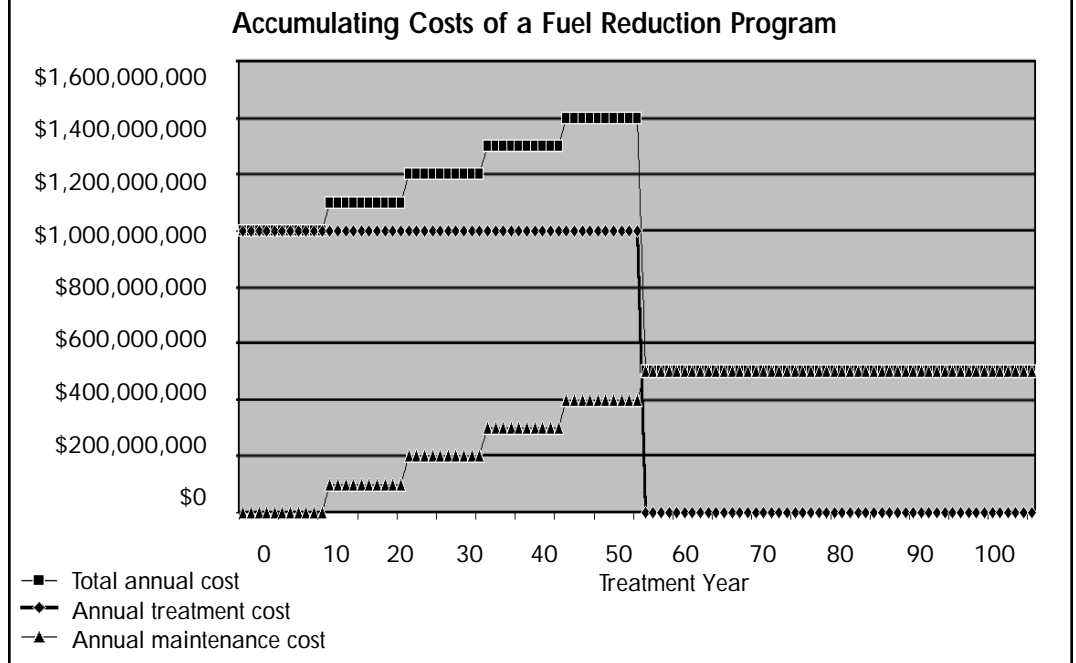
¹ Schmidt, K.M., Menakis, J.P., Hardy, C.C., Hann, W.J. and D.L. Bunnell. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. USDA Forest Service Gen. Tech. Rep. RMRS-87.

² Personal communication, Dennis L. Lynch, Colorado State University.

³ Barbour, R.J., Fight, R.D., Christensen, G.A., Pinjuv, G.L., and V. Nagubadi. 2001. Assessing the need, costs, and potential benefits of prescribed fire and mechanical treatments to reduce fire hazard in Montana and New Mexico. Report to the Joint Fire Sciences Program (http://www.fs.fed.us/pnw/woodquality/JLMFinal_report_dft5.PDF).

⁴ Fried, J., Barbour, J., Fight, R., and G. Pinjuv. 2002. Digest of the study: "Development of FIA BioSum to evaluate feasibility and impact of landscape-scale fuel treatments for biomass based energy generation." (http://www.fs.fed.us/pnw/fia/ear/jfried/projects/fia_biosum/FIA_BioSumDigest.pdf).

FIGURE 1.



Fuel treatment requires a long-term commitment to maintenance funding.

The purpose of fuel treatment is to create a lasting fuel structure that reduces fire danger. Because forests continually grow, keeping a desirable fuel structure requires regular maintenance in the form of mowing or prescribed fire. Thus, every acre that is treated creates a long-term maintenance load that requires continuous funding.

Figure 1 describes how these costs accumulate. Assuming a treatment cost of \$1000 per acre and a maintenance cost of \$100 per acre every ten years, treating one million acres per year would cost \$1 billion per year for the first ten years. After ten years, though, the acres treated in the first year would require maintenance at a cost of \$100 million per year. After 20 years, that cost grows to \$200 million per year. The maintenance cost continues to grow for as long as areas receive initial treatment such that after 40 years, the total cost of the program has risen to \$1.4 billion per

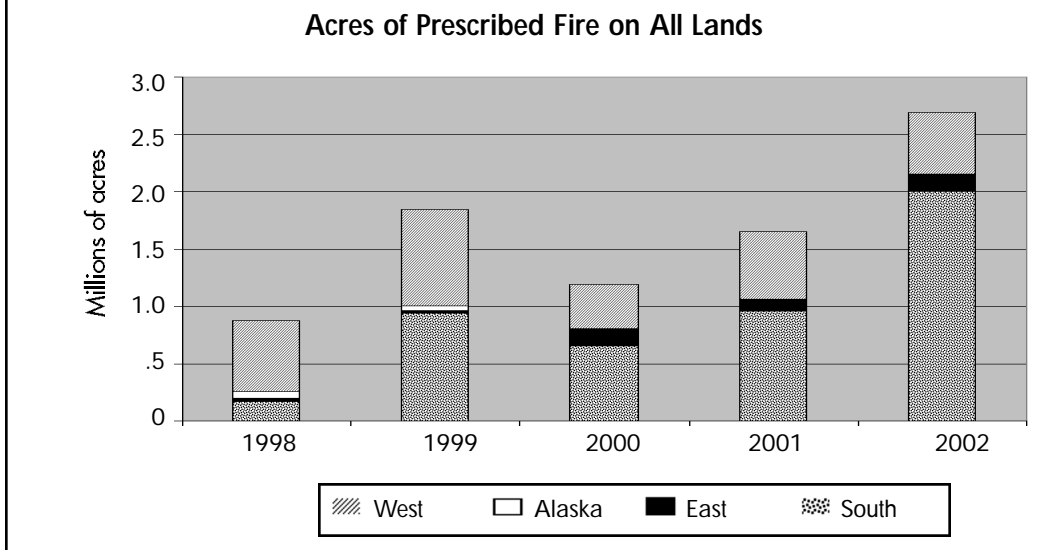
year. Even if initial treatment is terminated after 50 years, the maintenance load continues at a cost of \$500 million per year forever.

Because funding for maintenance is not unlimited, we must take care to treat only those acres that provide the greatest benefit. Unless these areas are maintained, the investment will be lost, and fire danger may be exacerbated.

Fuel treatments may not reduce fire-fighting costs.

Fire-fighting costs have risen dramatically in recent years. Fuel treatment has been proposed as a way of reducing extreme fire behavior, thereby making fire-fighting less difficult and less expensive. Often, the cost of fire-fighting is cited as what would be saved if fuel treatments were implemented. Unfortunately, such calculations only work if we are willing to expend less effort on fire-fighting. If we do not, we will only have added to the financial costs associated with wildfire.

FIGURE 2.



Wildland fire use is the most cost-efficient way to restore fire to ecosystems.

One way to save money is to fight fewer fires where it is safe to do so. It is now federal policy to promote “wildland fire use,” or the management of natural fires for their benefits to ecosystems. This policy has been shown to be an extremely cost efficient way to reduce fuels and achieve the benefits of fire in ecosystems. In Colorado in 2002, the Big Fish fire, managed for resource benefit, burned over 17,000 acres at a cost of \$112 per acre, compared to the Black Mountain fire, which burned 345 acres and was fought at a cost of \$3,188 per acre.⁵ Three fires in Alaska, which were monitored but not fought, burned almost 700,000 acres at a cost of less than \$5 per acre burned.⁶

Of course, wildland fire use cannot be implemented everywhere. It requires careful planning and sound judgment to

implement. Where it is possible, wildland fire use presents a real opportunity to save on fire-fighting costs while restoring fire to fire-dependent ecosystems. Money directed now at planning for wildland fire use will yield savings many times over in the future.

Where wildland fire use is unsafe, prescribed fire can substitute for natural fire.

While wildland fire use is the most cost-efficient way to restore fire, it is not always a safe alternative. Where fuels are high or structures are at risk, fire will have to be returned under controlled conditions. The 1995 Federal Wildland Fire Management Policy and Program Review recognized this need and directed federal agencies to “jointly develop programs to plan, fund, and implement an expanded program of prescribed fire in fire-dependent ecosystems.” Despite this direction, the use of prescribed fire has shown little increase, except in the

⁵ 2002 Report on the Health of Colorado’s Forests (http://dnr.state.co.us/pdf/DNR.ForestHealthReport_2002.pdf).

⁶ Data from Archived NICC Incident Management Reports (<http://stone.cidi.org/wildfire>).

⁷ Ibid.

South, where fire is commonly used to prepare sites for timber management (Fig. 2).⁷

Conclusion

The high costs of fuel treatment present a real barrier to the accomplishment of restoration objectives. Where it is safe, the most cost-efficient way to restore fire is to let natural fires burn. Where this cannot be tolerated, the

next best method is prescribed fire. Thinning is economical only where the values at risk are greatest, and even then, thinning will not pay for itself through the sale of trees. The Forest Service has been losing money selling commercial timber off the national forests for years. It is unlikely that adding non-commercial, small diameter trees to the mix will yield positive returns.