

Potential Jobs and Wages from Investments in Defensible-Space Approaches to Wildfire Safety

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This report provides information rural communities in the forested regions of California might find useful if they want to assess the potential impact on jobs and wages when weighing how to allocate resources between two general strategies for improving their wildfire safety.

One general strategy takes the forest-altering approach, which entails logging/thinning across large areas of the forest to alter the behavior of fires before they come near a community. This approach often is promoted as a source of jobs for local workers, especially when it produces logs and chips for sawmills and biomass-fired power facilities that are highly visible employers.

The other general strategy for improving wildfire safety takes the defensible-space approach. It directly prevents buildings from igniting from wildfires by trimming vegetation within 200 feet of the buildings and modifying the buildings (e.g., replacing shingle roofs with fire-safe materials). The defensible space-approach has been shown to be highly effective in protecting homes from wildfire,¹ but it sometimes receives less attention because its impacts on jobs and wages are spread among diverse employers.

This report begins to fill the current gap in information about potential jobs and wages from defensible-space work. It describes the potential jobs and wages that can result from investments in defensible-space work and compares them with the jobs and wages that can result from forest-altering investments. It draws on research specific to defensible-space activities² but, because this research is limited, it also uses data from research on similar activities.³ Ecosystem-restoration activities provide estimates of potential jobs and wages from vegetation-management activities undertaken to improve defensible-space safety. Home-remodeling activities provide estimates for home modifications that reduce the ignitability of homes and other buildings. The data indicate that spending \$1 million to enhance the defensible space around buildings by trimming vegetation can create 23 jobs. Of these, 17 jobs are directly tied to the contractors doing the work, and 6 are indirect jobs supported by spending by the contractors and direct employees.

Table 1 compares the potential jobs from spending \$1 million on vegetation-management activities under the defensible-space approach versus under the forest-altering approach.⁴ The estimates apply, respectively, to labor-intensive vegetation-trimming activities under the defensible-space approach and machine-intensive thinning under the forest-altering approach in small, rural counties with some contractors experienced in these activities.⁵ Total jobs under the defensible-space approach would exceed the total jobs under the forest-altering approach by a ratio of 2.3-to-1. For direct jobs, the ratio would be even higher, 3.4-to-1.

Table 1. Potential Jobs from Spending \$1 Million on Vegetation-Management Activities

	A Defensible-Space Approach	B Forest-Altering Approach	C Ratio (A + B)
Total ^c	23	10	2.3:1
Direct	17	5	3.4:1
Indirect	6	6	1:1

Table 2 shows comparable data for workers' wages from spending \$1 million on vegetation-management activities under the two approaches. Workers' wages under the defensible-space

approach would exceed the wages under the forest-altering approach by a ratio of 1.4-to-1 for all workers and by 1.8-to-1 for workers directly employed by the contractors.

Table 2. Potential Wages from Spending \$1 Million on Vegetation-Management Activities

	A Defensible-Space Approach	B Forest-Altering Approach	C Ratio (A + B)
Total ^c	\$560,000	\$390,000	1.4:1
Direct	\$410,000	\$230,000	1.8:1
Indirect	\$160,000	\$160,000	1:1

A specific wildfire-safety program might yield jobs and wages higher or lower than those shown, due to differences in implementation. For example, defensible-space programs that focus on designing and installing fire-safety retrofits for buildings, rather than on trimming vegetation, likely would yield fewer jobs per \$1 million invested, similar to those for logging/thinning programs under the forest-altering approach.⁶ Jobs and wages could be higher than shown for the forest-altering approach if woody material is transported from the site and used as raw material for wood-product manufacturing and as biomass for electricity-generation. For example, an analysis in Amador and Calaveras Counties suggests that, under specific conditions, total jobs and wages could be similar to those shown above for the defensible-space approach to vegetation trimming, primarily through an increase in direct jobs associated with the mills and generating facilities.⁷ The analysis noted, however, that the projected impacts on workers would not materialize when market demand for the material is weak, or in areas where the costs of transporting the material to these facilities exceed its market value. Furthermore, job-creation from forest-altering activities likely will decline over time as contractors adopt increased use of labor-saving machinery, such as feller-bunchers.⁸

In sum, investment in defensible-space activities can provide not just wildfire-safety benefits but also significant job-creation benefits for rural communities in California. Moreover, the information currently available indicates that, in many circumstances, the same level of spending likely will yield more jobs and wages for local workers under the defensible-space approach than under the forest-altering approach.

¹ See, for example, Cohen, Jack D. 2000. "Preventing Disaster: Home Ignitability in the Wildland-Urban Interface." *Journal of Forestry*. <http://www.firewise.org/~media/firewise/files/pdfs/research/cohenpreventingdisaster.pdf>.

² See, for example, Evans, Alexander, Sarah Auerbach, Lara Wood Miller, Rachel Wood, Krys Nystrom, Jonathan Loevner, Amanda Aragon, Matthew Piccarello, and Eytan Krasilovsky. 2015. *Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland-Urban Interface*. http://forestguild.org/publications/research/2015/WUI_effectiveness.pdf; Evan Osgood, Fire Adapted Communities Coordinator, Lake Valley Fire Protection District. Personal communication; and Lake Valley Fire Protection District. 2007. "Wood Roof Replacement Program." http://www.lakevalleyfire.org/categories/listings/index.php?option=com_content&view=article&id=35&catid=2&Itemid=182.

³ See, for example: Hesselgrave, Taylor, Cathy Kellon, and Kristen Sheeran. 2015. *A Brief Economic Analysis of Watershed Restoration Investments: A Case Study of Southwestern Oregon*. http://archive.ecotrust.org/wwri/downloads/Methods_for_Value_of_Watershed_Restoration_5-12.pdf.

⁴ Estimates derived from "Restoration Calculators" developed by the University of Oregon's Ecosystem Workforce Program, applied to representative small, rural counties with a legacy of timber production in eastern Oregon and Montana. See <http://ewp.uoregon.edu/calculate>.

⁵ Counties with a larger, more diversified economy likely would see more jobs and higher incomes from the expenditures. Expenditures in counties lacking these contractors likely would yield fewer local jobs and lower wages.

⁶ Hesselgrave, Taylor, Cathy Kellon, and Kristen Sheeran. 2015. *A Brief Economic Analysis of Watershed Restoration Investments: A Case Study of Southwestern Oregon*. http://archive.ecotrust.org/wwri/downloads/Methods_for_Value_of_Watershed_Restoration_5-12.pdf.

⁷ The Nature Conservancy, Sierra Nevada Conservancy, U.S. Forest Service. 2014. "Chapter 7: Treatment Costs and Impacts – Timber and Biomass." *Mokelumne Watershed Avoided Cost Analysis*. http://www.sierranevada.ca.gov/our-work/mokelumne-watershed-analysis/MACA_7_Treatments_Costs_Impacts.pdf.

⁸ For example, a feller-buncher produced by Finnish company Ponnse can eliminate jobs for eight logging workers. Jason Wilson. 2017. "Into the woods: how the logging industry is courting millennials." *Guardian*. 23 August. <https://www.theguardian.com/us-news/2017/aug/23/logging-industry-work-employment-oregon>.

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