

Economic Importance of the Oregon State Forest Habitat Conservation Plan (HCP)

Comments Submitted to the Oregon State Forester, Cal Mukumoto

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Core Messages

Extensive evidence indicates the economic benefits from conservation will far exceed the economic costs.

- A. Climate pollution from continued logging will kill people. Managing state lands for conservation will avoid these deaths and generate huge economic benefits.
- B. The nonlethal economic benefits from investments in conservation will exceed the forgone logging revenues by perhaps more than 20-to-1.
- C. Investments in conservation have the potential to have bring about broad, positive economic impacts for workers and communities—jobs, incomes, property values, etc.—especially if appropriate steps are taken to facilitate a smooth transition.

A. Climate Pollution from Continued Logging Will Kill People. Managing State Lands for Conservation Will Avoid These Deaths and Generate Huge Economic Benefits

For years, scientists have recognized that climate pollution kills people, in Oregon, across the US, and around the globe, but have been unable to quantify the number of deaths per unit of climate pollution. Researchers from Canada and Austria recently responded to the challenge, providing a credible estimate after reviewing more than 180 peer-reviewed scientific articles. They concluded it is reasonable to anticipate that **every 3,700 tons of carbon dioxide** (or equivalent for other pollutants) **added to the atmosphere likely will lead to the death of one person**.¹

The timber industry is Oregon's largest, single source of climate pollution, adding the equivalent of 35 million tons of carbon dioxide to the atmosphere per year.² These numbers mean that **annual timber production in Oregon will be responsible for killing about** (35 million ÷ 3,700 =) **9,500 people**. The climate pollutants materialize as the industry in Oregon produces about 4 billion board feet of logs per year, so that **each million board feet of logs will kill about 2.4 people**.

State Lands have recently produced about 484 million board feet of logs per year,³ generating **climate pollution that kills:**

- **1,200 persons per year.**
- **3 persons per day.**
- **2 persons per logging job.**⁴

A transition away from logging and toward ecosystem conservation and restoration will avoid these deaths.

¹ Pearce, J.M., and R. Parncutt. 2023. [Quantifying Global Greenhouse Gas Emissions in Human Deaths to Guide Energy Policy](#). The researchers present evidence that supports the so-called "'1000-ton rule,' according to which a person will be killed in response to climate pollution every time 1000 tons of fossil carbon are burned...." They then observe that burning 1,000 tons of fossil carbon results in and is equivalent to adding 3,700 tons of carbon dioxide to the atmosphere. Hence, the "1000-ton rule" for carbon is equivalent to a "3,700-ton rule" for carbon dioxide. The authors also acknowledge the uncertainty inherent in the 1000-ton rule: the actual number of deaths might be smaller or larger. **Evidence suggests it would be prudent to assume that the actual death rate is higher today and will become even higher in the future.** See, for example: Hansen, J., M. Sato, L. Simons, and others. 2023. [Global Warming in the Pipeline](#); British Medical Journal and others. 2023. [Time to Treat the Climate and Nature Crisis as One Indivisible Global Health Emergency](#); Newman, R., and I. Noy. 2023. [The Global Costs of Extreme Weather that Are Attributable to Climate Change](#); Lenton, T.M., and others. 2023. [The Global Tipping Points Report 2023](#); and He, H., R.J. Kramer, B.J. Soden, and N. Jeevanjee. 2023. [State Dependence of CO₂ Forcing and Its Implications for Climate Sensitivity](#).

² Segerstrom, C. 2018. [Timber is Oregon's Biggest Carbon Polluter](#).

³ Bureau of Business and Economic Research, University of Montana. 2023. [Oregon Timber Harvest](#)

⁴ The Oregon Employment Department in 2022 classified 4,520 employees in the state as "loggers" which includes "loggers, equipment operators, truck drivers, and fallers and buckers". The trees they killed resulted in climate pollution that will kill 9,500 people. These numbers indicate that climate pollution from PNW timber production will kill (9,500 ÷ 4,520 =) 2+ deaths per logger.

B. The Nonlethal Economic Benefits from Investments in Conservation Will Exceed the Forgone Logging Revenues By Perhaps More Than 20-to-1

The transition from logging to conservation will generate economic benefits through positive impacts on biodiversity and ecosystems and by avoiding the social costs from logging-related climate pollution.

Global research suggests it would be prudent to expect that, if logging continues, the economic costs to society from negative impacts on biodiversity and ecosystems will exceed the value of the logs produced. A recent review of global research, for example, reached these conclusions:

“Our analysis shows that both conservation and ecological restoration bring considerable net benefits in terms of public goods and common pool resources, regardless of the habitat or type of ecosystem state change being considered. ... [O]ur findings do suggest that, within the broad habitat and geographic range present in our data, we have typically passed the point where the benefits of further change from nature towards human-modified uses exceed the costs to society.”⁵ [bold emphasis added]

Research in the Pacific Northwest confirms this conclusion. For example, after comparing two alternatives – one that would allow logging to proceed, and another that would restrict logging to protect potential nesting sites for northern spotted owls – Washington’s Department of Natural Resources (DNR) concluded that the benefits of protecting the habitat can be 5 times the benefits from logging.⁶

These findings are in line with those of a landmark, global assessment.⁷ Commissioned by the UK Treasury, it found that **if, instead of managing lands to extract timber and other materials, lands were managed to restore and conserve healthy ecosystems, the net economic benefits to society as a whole would be about 4 times larger.** The assessment also concluded that the differential between the net benefits from restoration/conservation vs. timber and other extractive industries is increasing. These findings arise because human actions “have degraded the biosphere to the point where the demands we make of [ecosystem] goods and services far exceed its ability to meet them on a sustainable basis.”

Investments in conservation also will generate economic benefits by avoiding logging-related climate pollution. These benefits are indicated by estimates of the social cost of carbon dioxide, i.e., the costs imposed on society by each ton of carbon dioxide added to the atmosphere.

Logging has been responsible for about one-third of Oregon’s total greenhouse-gas (GHG) emissions, more than any other source (Figure 1).⁸ Two separate analyses have confirmed this conclusion.⁹ In 2016, researchers for the Bureau of Land Management (BLM) traced the overall

⁵ Bradbury, R.B., S.H.M. Butchart, B. Fisher, and others. 2021. [The Economic Consequences of Conserving or Restoring Sites for Nature](#).

⁶ Krug, D., 2007. [Preliminary Economic Analysis: Forest Practices Rulemaking Affecting Northern Spotted Owl Conservation](#). Olympia, WA: Department of Natural Resources.

⁷ Dasgupta, P. 2021, [The Economics of Biodiversity: The Dasgupta Review](#). (London: HM Treasury)

⁸ Segerstrom, C. 2018. [Timber is Oregon’s Biggest Carbon Polluter](#).

⁹ Law, B.E., et al., 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. *Proceedings of the National Academy of Sciences of the United States of America* 115: 3663- 3668; Talberth, J., 2017. Oregon Forest Carbon Policy: Scientific and technical brief to guide legislative intervention. Portland, OR: Center for Sustainable

impact of logging on the amounts of carbon dioxide in the atmosphere. They then applied an estimate of the economic damage expected to result from each additional ton. In 2016, the BLM used an estimate of the social cost of carbon dioxide, about \$50 per ton of carbon dioxide, that showed logging on BLM lands in western Oregon would yield climate-related economic damage of at least \$5,000 per truckload.¹⁰ Since then, an updated estimate of the social cost of carbon dioxide indicates that the economic damage, per truckload of logs will be at least \$34,000 per truckload.¹¹

These costs far exceed the value of the logs. Recent, pre-pandemic market prices for logs have been about \$500 per thousand board feet (mbf) and each loaded logtruck carries about 5 mbf, so the market value per truckload is about \$2,500. The climate-related costs imposed on society by each truckload of exceeds the value of the logs by more than $(\$34,000 - \$2,500 =)$ \$31,500. The ratio of costs to the value of logs is more than 14-to-1. The numbers represent a direct loss in goods and services and economic well-being.¹²

The actual climate-related costs will be much larger than the figures shown, insofar as these numbers represent only five categories of economic harm from increases in atmospheric carbon dioxide and do not include many others.¹³ The numbers do not, for example, represent the costs

Economy. Available online at: <https://sustainable-economy.org/osu-research-confirms-big-timber-leading-source-greenhouse-gas-emissions-oregon/>.

¹⁰ The BLM showed that future logging on BLM lands in western Oregon would result in substantial increases in atmospheric CO₂, and the economic costs resulting from the increases would exceed the value of the logs produced by a ratio of more than 4-to-1. [BLM. 2016. [Proposed Resource Management Plan/Final Environmental Impact Statement: Western Oregon](#). p. 657.] The BLM estimated that the market price of logs would be about \$250 per mbf, so a truckload of 5 mbf would have a market value of about \$1,250, and the accompanying social cost would be at least 4 times this amount, or \$5,000+.

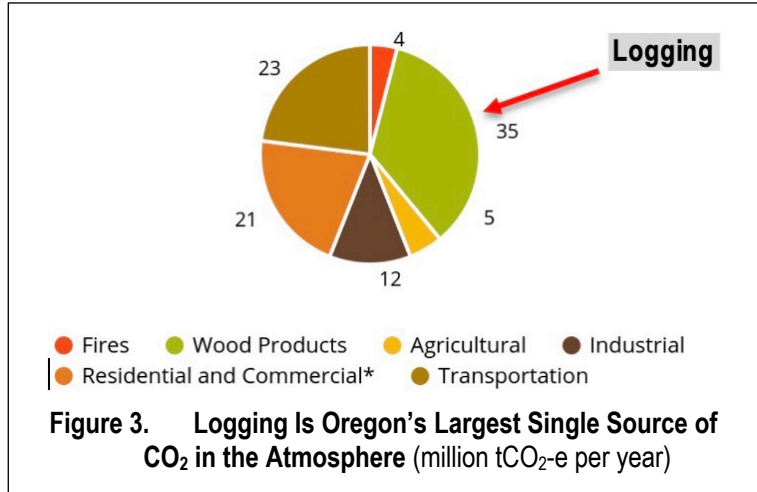
¹¹ In 2016, the social cost of carbon dioxide used by the BLM was about \$50 per ton. EPA's update raised this value to \$190, assuming a discount rate of 3% per year, but recognized that, with a lower discount rate, the value would be \$340 per ton. [EPA. 2022. [EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances](#).] This report assumes the value is at least \$340 per ton, with reference to [research](#) that shows that, when evaluating the costs from activities that generate pollution that causes environmental deterioration, it is appropriate to use low discount rates, or even negative rates.

¹² Some might be tempted to dismiss these estimates of the economic damage resulting from timber production in Oregon because tracing the movement of a molecule of carbon dioxide added to the atmosphere from Oregon's timber production might reveal that its direct negative impacts on goods, services, and economic well-being occur somewhere else. The global scope of the climate crisis, however, means that carbon dioxide added to the atmosphere somewhere else might trigger reductions in goods, services, and economic well-being in Oregon. This reciprocal relationship means that it is reasonable, and morally imperative, to recognize that the timber industry's climate pollution has negative impacts on Oregonians.

¹³ The estimates per metric ton include damage to coastal communities from sea level rise, net changes in mortality from increased temperatures, reductions in labor productivity from increased temperatures, reductions in production of major crops, and increased expenditure on electricity and other sources of energy for cooling in response to higher temperatures. EPA. 2022. [EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances](#). The estimates do not include numerous other categories of economic damages from climate pollution, including, but not limited to these:

More frequent, intense weather	Irrigation water shortages for livestock and crops
Increases in psych-social trauma	Increases in agricultural pests and diseases
Reduced productivity marine ecosystems	Increased incidence of human diseases
Reduced productivity terrestrial ecosystems	Increased stress on at-risk species
Reduced productivity aquatic ecosystems	Accelerated spread of undesirable invasive species
Degradation of infrastructure from higher temperatures	Increases in fish and wildlife diseases

from heatwave-related illness, negative impacts on fisheries, the costs of starvation from famines, and climate-related increases in violence and involuntary migration. Incorporating these and myriad other costs into the analysis would drive the climate-related costs from industrial timber production much higher.

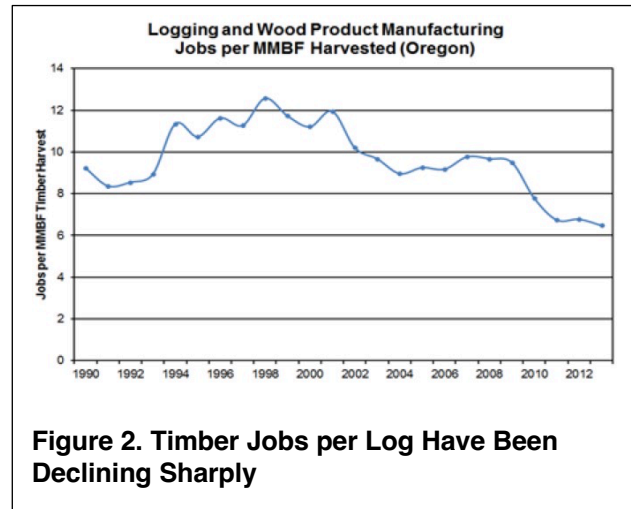


Increased variability in weather conditions
Increases in violence and conflict

Increased migration
Reduced opportunities for outdoor recreation

C. Investments in Conservation Have the Potential to Bring About Broad, Positive Economic Impacts for Workers and Communities—Jobs, Incomes, Property Values, etc.—Especially if Appropriate Steps Are Taken To Facilitate a Smooth Transition

Encouragement for log production from State Lands comes from those who assert that it is necessary to provide economic growth for rural communities and high-paying jobs for rural workers. A catalog of facts, however, points in the opposite direction. Landscapes scarred by logging can kneecap the ability of forests to generate jobs in other sectors. For decades, communities in Oregon surrounded attractive natural-resource amenities, such as clean water and salmon in streams have experienced robust economic activity and higher family incomes by attracting highly mobile entrepreneurs, investors, and skilled workers.¹⁴ These people typically don't, however, move into areas surrounded by industrial timber production.



Instead, clearcuts full of stumps and dense plantations that increase the risk of intense wildfire exert persistent, negative impacts on rural jobs and economic vitality. The number of manufacturing jobs per unit of logs (Figure 2) has been declining for more than two decades. The number of jobs for “loggers,” an occupational category that includes “loggers, equipment operators, truck drivers, and fallers and buckers,” hasn’t shown the same decline in recent years, but wages are low: the average wage for Oregon’s loggers is about 15 percent below the statewide average for all jobs.¹⁵ In the past, these workers enjoyed wages as much as 30 percent higher than the statewide average, so the current relationship indicates that timber production has brought long-term economic decline, not growth, on rural workers and communities.¹⁶

Research in Oregon provides some detail to the negative effects on local economies, by showing a strong statistical correlation between logging and negative economic indicators. Specifically, counties with more logging have lower median wages, and a higher percentage of the population lives in poverty (Figure 3).¹⁷

¹⁴ See, for example, Rooney, B. [Oregon’s Forestry and Logging Industry: From Planting to Harvest](#); and Hjerpe, E., A. Hussain, and T. Holmes. 2020. [Amenity Migration and Public Lands: Rise of the Protected Areas](#).

¹⁵ Rooney, B. [Oregon’s Forestry and Logging Industry: From Planting to Harvest](#).

¹⁶ Lerner, Josh. 2017. [Oregon’s Timber History, An Update](#).

¹⁷ County harvest data courtesy of Oregon Department of Forestry. Poverty and median wage data are taken from the U.S. Census. See Talberth, J., 2017. Modernizing State Forest Practices Laws to Halt and Reverse Deforestation. West Linn, OR: Center for Sustainable Economy.

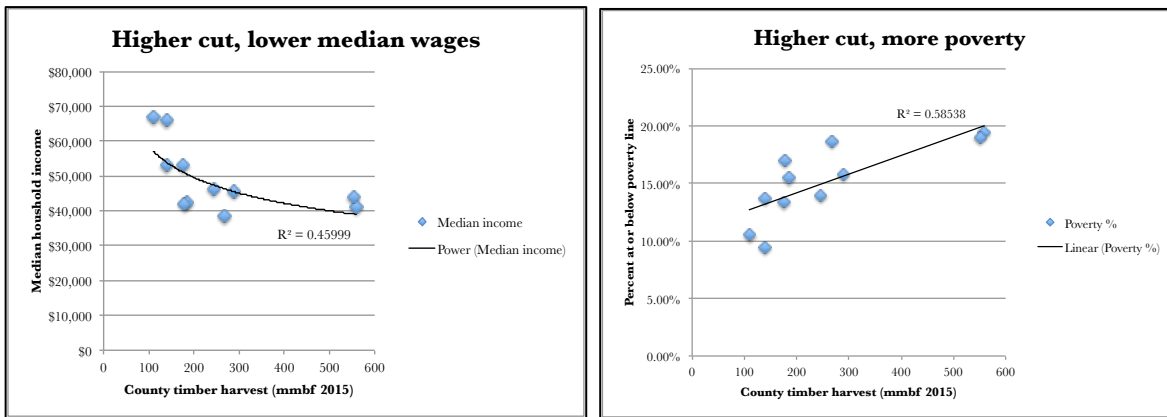


Figure 3. In Counties in Western Oregon with Significant Timber Harvest, More Logging Correlates with Lower Wages and More Poverty.

Would the economic and social outlook be different with curtailed timber production and management of State Lands with an emphasis on conservation and restoration? Substantial evidence indicates that it would. Research reaching back over several decades indicates that a change in management emphasis from timber production to conservation and restoration likely would yield a much brighter future for jobs, incomes, and overall economic activity.

Some of this evidence comes from research conducted in Oregon, which found that proximity to conserved forestlands typically correlates with faster growth in community wealth. Specifically, communities within 10 miles of land designated for species protection “experienced higher growth in community wealth than communities more than 10 miles from...protected land, even among those that were dependent upon logging.”¹⁸ More broadly, this research found that actions—known as the Northwest Forest Plan (NWFP)—to manage federal lands for conservation rather than for timber production had wide-ranging, positive impacts on rural communities:

“The preservation of natural forest capital through the NWFP ultimately has induced a redistribution of the forest-related benefits of Federal forestland across communities. Historically, the major benefits came from the timber production which went mainly to the timber-dependent communities. The implementation of the NWFP, signaling that the federal government wanted to protect old-growth forestland, appears to have promoted community wealth in communities close to the protected land, and to have redistributed the economic benefits from the timber-dependent communities to a broader set of NWFP-adjacent communities

Two major factors underlie the likelihood that that forest conservation would stimulate an increase in jobs and community prosperity. One is the outdoor recreation/tourism industry; the other is the movement of families and businesses to communities with attractive amenities. The outdoor recreation/tourism industry is huge—nationally it is larger than the motor vehicle manufacturing industry, the motion picture industry, and many other economic heavyweights—and it has been growing doggedly and rapidly—about 5 percent annually

¹⁸ Weber, Bruce, and Yong Chen. 2012. “Federal forest policy and community prosperity in the Pacific Northwest.” *Choices*. 27(1). <http://www.choicesmagazine.org/choices-magazine/theme-articles/rural-wealth-creation/federal-forest-policy-and-community-prosperity-in-the-pacific-northwest->

between 2005 and 2011, a period that includes a major recession and contraction for most industries.¹⁹ Implementation of the HCP might stimulate activity in this industry by managing forests to provide more recreational opportunities rather than converting them into stumps and monoculture plantations. Some have disparaged this possibility, however, because, relative to timber, this industry pays lower average wages. But, for many workers and families, an industry that can deliver 5 percent growth in jobs, even with lower wages, is preferable to one that promises more layoffs, higher unemployment, and greater social distress.

Despite its huge size and robust growth, the ability of the outdoor recreation/tourism industry to stimulate growth in jobs, incomes, and economic activity often comes up short, relative to the forces and trends that drive the movement of workers, families, and businesses to communities with attractive amenities. New workers often have higher levels of skill and incomes, new families typically have higher incomes to spend in local shops, and new businesses generally have the ability to grow more rapidly than long-established businesses. All of these factors can contribute to a more robust and sustainable local economy, generating new economic opportunities for the current residents of nearby communities and providing resources to strengthen the support for schools, healthcare, and other services.

This is not a new phenomenon. In 1999, an economist with the USDA Economic Research Service, looked back and concluded:

“Climate, topography, and water area are highly related to rural county population change over the past 25 years. A natural amenities index, derived and discussed here, captures much of this relationship. Average 1970-96 population change in nonmetropolitan counties was 1 percent among counties low on the natural amenities index and 120 percent among counties high on the index. ... Employment change is also highly related to natural amenities.... The importance of particular amenities varies by region...people are attracted to the West for its varied topography.”²⁰

A more recent analysis concluded that, on average, counties with more public land protected from logging and other extractive activities enjoy increased economic performance. After statistically controlling for the influence of other factors, the researchers found that, on average, a western county with 10,000 additional acres of protected public land exhibited higher average per capita income (additional \$436 in 2010), faster growth in per capita income (additional \$237 for 1990-2010), and faster growth in non-labor per capita income (additional \$174 for 1990-2010).²¹

An even more recently completed review of this phenomenon found that it has been transforming the economies of communities across the West:

“During the past three decades, rural communities in the American West have experienced significant economic restructuring, transitioning from extractive-based industries toward service-based economies. A major impetus for economic restructuring in the Western U.S. (hereafter, the West) has been amenity migration, a phenomenon in which people relocate to communities for physical and social amenities derived from an abundance of desired ecosystem services as opposed to simply following employment opportunities. These amenity migrants include footloose entrepreneurs,

¹⁹ Outdoor Industry Association. 2021. [The Outdoor Recreation Economy](#).

²⁰ McGranahan, D.A. 1999. [Natural Amenities Drive Population Change](#).

²¹ Rasker, R., Gude P.H., and Delorey, M., 2013. [The Effect of Protected Federal Lands on Economic Prosperity in the Non-Metropolitan West](#).

retirees, and people willing to trade income for a higher quality of life. ... [P]ublic lands have consistently been shown to play a role in attracting amenity migrants.”²² [Citations omitted]

The last sentence of this text indicates that managing State Lands to produce attractive amenities could encourage significant economic restructuring, transitioning away from extractive timber production and toward a service-based economy. In other words, producing less timber and more conservation and restoration could facilitate the transition of local communities away from an industrial focus that evolved in the 1800s and encourage economic activities characteristic of the 21st Century.

The researchers who produced this last review also described the factors that have discouraged local communities from making this transition. They observed that, in many counties and communities with historically strong ties to timber and other extractive industries, community leaders often fail to see the opportunities for conserving and restoring resources so they provide environmental amenities and then marketing these amenities to attract economic activity that can more than offset declines in the extractive industries.

“Our results...illustrate that protected areas have a substantial influence on migrant relocation decisions and have become a marketable commodity in their own right. The economic value associated with protected areas and their influence on amenity migration should become a regular component of the discourse that surrounds new proposals for protected areas and new proposals for resource extraction. Currently, these economic values are largely left out of conversations about rural development. County commissioners, conservationists, and regional policymakers would do well to become more fluent in understanding the wealth-attracting influence of protected areas.”

This statement captures the core messages supported by the evidence presented above. Those who advocate for more timber production from State Lands typically focus on the positive impacts for workers lucky enough to retain their jobs, but overlook the negative economic effects that the logging has on the overall welfare of all the people and on the economic and social well-being of local workers and communities. They would do well to investigate and understand the likelihood that conserving and restoring these lands would create opportunities for more jobs for a wider segment of the population, stimulate higher incomes and wealth, and thereby provide a stronger foundation for the local public services that currently receive timber revenues.

Stated differently, the evidence presented above shows that, if conservation and restoration activities can yield amenities attractive to potential in-migrants, recreationists, and tourists, the State Lands likely would become a powerful engine of economic development advantageous to local workers, families, and communities. This is not just tourism, far from it. Instead, it represents the economic realities of today’s American rural West, where resource managers and communities that emphasize attracting talent and diverse investments have a far higher chance of enjoying prosperity and sustainable population than communities that emphasize the production of logs and stumps and monocultural plantations. A shift in focus to conservation and restoration can help nearby communities and rural residents have access to these realities.

²² Hjerpe, E., A. Hussain, and T. Holmes. 2020. [Amenity Migration and Public Lands: Rise of the Protected Areas](#).