

**3 August 2021**

**TO: Members, Oregon Board of Forestry**  
**FROM: Ernie Niemi, President**  
**SUBJECT: COMMENTS FOR 8 SEPTEMBER BOARD MEETING, AGENDA ITEM #1**

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Please consider in your deliberations and decisions the information I am submitting on the attached pages.

The information shows that timber production and conservation/restoration have dramatically different socio-economic consequences. A decision to produce timber on ODF-managed lands will generate some short-term benefits for a few Oregonians, but impose much larger and long-lasting costs on all Oregonians as a whole. The overall impact on social well-being will be starkly negative. The costs will be especially severe for today's children. Every increment of timber production will reinforce and contribute to powerful forces and trends that promise future degradation of the resources on ODF-managed lands, but every increment of additional conservation/restoration will offset these forces and trends. Every investment in timber production will yield a much lower rate of return for Oregonians than would result from investment in conservation/restoration, so that the relative rate of return from timber investments will be negative. Every decision to produce more timber will leave workers and communities chained to an antiquated model of economic development with a long record of eliminating jobs, not creating new ones, whereas a greater emphasis on conservation/restoration will open 21<sup>st</sup>-century opportunities for more jobs, higher incomes, and sustained prosperity in Oregon's rural communities.

This information comes from the cited research and other sources, plus my professional experience, which includes more than 40 years analyzing the economic importance of natural resources. Much of this work has focused on Oregon and the mechanisms through which the state's forests, waters, and fish/wildlife generate or eliminate jobs for Oregon's workers, increase or decrease the prosperity of its communities, and improve or diminish the social well-being of rural and urban residents. I also have conducted similar analysis in neighboring states, in other regions of the U.S., and in other countries. I have been President of Natural Resource Economics, a consultancy in Eugene, since 2012. I previously worked as an economist for Coos, Curry, and Douglas Counties; under contract with the timber industry in Douglas County, and as a Vice President with the regional consultancy, ECONorthwest.

If you have any questions about the information I am submitting to you, please feel free to let me know.

## I. INTRODUCTION AND SUMMARY

The Oregon Department of Forestry (ODF) is currently developing a Habitat Conservation Plan and Forest Management Plan for about 640,000 acres west of the Cascades, in the context of a broad obligation of provide economic, environmental, and social benefits to Oregonians. ODF often distorts this broad obligation, however, applying instead a narrow institutional focus on timber production, with the justification that this is the best way to generate economic benefits: “Timber sales on these forests produce jobs and revenue that funds counties, local districts, and schools throughout the state.”<sup>1</sup> This statement diverts attention away from the high costs timber production imposes on all Oregonians.

This report provides information regarding the potential economic consequences of shifting away from the narrow focus on timber production. This information shows:

### I. Timber Production on Imposes Costs on Society that Far Exceed Timber Revenues

Timber production imposes economic costs on society through adverse impacts on the environment and communities. Economists use the term, external costs, to describe these costs because they fall on individuals and groups other than those who directly make timber-production decisions or receive benefits from timber production. The evidence presented below demonstrates that these external costs currently far exceed timber revenues, and that this gap likely will grow rapidly. Hence, continued production of timber from ODF-managed lands will have a large and growing net negative impact on society’s overall economic well-being.

### II. Short-Term Timber Production Diminishes the Long-Term Productivity and Value of ODF-Managed Resources

The evidence presented below shows that industrial timber production on ODF-managed lands intensifies the climate crisis and, hence, increases the risk that climate changes – hotter temperatures, more drought, wider wildfires, etc. – will reduce the lands’ future ability to produce timber, jobs, and revenues in the future. The evidence also shows that timber production degrades the ability of ecosystems to generate ecosystem services that contribute to the well-being of society as a whole.

### III. Greater Emphasis on Conservation and Restoration Would Reinforce Opportunities for More Jobs, Higher Incomes, and Stronger Local Economies

Contrary to oft-repeated assertions by its supporters, the timber industry, for many decades, has had deep, negative impacts on workers, families, and communities. Some of the impacts occur directly, as the industry persistently eliminates jobs, with correlative impacts on the number of families living in poverty and other indicators of social distress. Others occur indirectly, as the industry’s legacy and influence distract communities from pursuing opportunities that have greater potential to strengthen local economies. Giving greater emphasis to managing lands for conservation and restoration would bolster powerful forces that have potential to create more jobs, raise incomes, and strengthen local economies.

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<sup>1</sup> ODF. 2021. [State Forests: About](#).

## I. EXTERNAL COSTS TIMBER PRODUCTION IMPOSES ON NON-BENEFICIARIES

Whenever ODF produces timber, it generates both benefits and costs. The benefits are measured by the revenues it receives from timber sales, i.e., the value of the logs. The costs include economic damage imposed on society as a whole. Economists commonly apply the term, “external costs” to describe these costs because they accrue to workers, families, businesses, communities, and future generations who lie outside the pool of individuals and institutions that exert decision-making authority over timber production or directly enjoy the benefits. The external costs from timber production materialize in many ways. One useful way to sort through and understand their scope and scale looks closely at those associated with (a) the climate crisis, and (b) the biodiversity/ecosystem crisis.

### A. CLIMATE-RELATED EXTERNAL COSTS

This section describes the climate-related external costs of timber production from two perspectives:

1. The total costs to society
2. The costs borne by today’s children

#### 1. TOTAL COSTS TO SOCIETY

Timber production in Oregon substantially increases atmospheric carbon dioxide, and these increases will impose economic costs on society for the foreseeable future. These external costs are complex and difficult to measure, but the data currently available indicate that they are perhaps more than 84 times larger than the logging revenues. Recent research findings strongly indicate that the climate-related external costs from future increases in atmospheric carbon dioxide will grow rapidly, perhaps catastrophically, in the coming years.

In recent years, ODF has produced about 300 million board feet (mmbf) of timber per year.<sup>2</sup> For example, it produced 297 mmbf in 2019, generating about \$140 million in net revenue.<sup>3</sup> Doing so increased atmospheric CO<sub>2</sub> through several pathways. Trees killed by logging will no longer grow bigger and sequester more carbon, logging residue was burned as slash, mills burned sawdust, and many wood and paper products will decompose within a few years. The extent of the CO<sub>2</sub> emissions was recently determined by researchers, who found that timber production increases atmospheric CO<sub>2</sub> by about 8,500 metric tons per million board feet (mmbf) of timber.<sup>4</sup> Multiplying these numbers indicates that ODF’s FY2019 timber-production program contributed about 2.5 million metric tons of CO<sub>2</sub> to the atmosphere.

This additional CO<sub>2</sub> in the atmosphere will impose economic harm on all people by exacerbating the many components of the climate crisis. It will make heatwaves, droughts, and

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<sup>2</sup> University of Montana, Bureau of Business and Economic Research. 2021. [Oregon Timber Harvest](#).

<sup>3</sup> ODF and Association of Oregon Counties. 2020. [Council of Trust Land Counties Annual Report](#).

<sup>4</sup> Law, B.E., et al. 2018. [Land use strategies to mitigate climate change in carbon dense temperate forests](#); Center for Sustainable Economy (CSE). 2017. [Oregon forest carbon policy: scientific and technical brief to guide legislative interventions](#).

wildfires more frequent and intense, for example. Many economists have developed estimates of the economic damage per metric ton of carbon dioxide, commonly called the “social cost of carbon dioxide” (sometimes abbreviated as the “social cost of carbon”). In 2016, federal agencies estimated that each metric ton of CO<sub>2</sub> added to the atmosphere will cause economic damage of about \$40-\$50.<sup>5</sup> The agencies acknowledged that the true social cost is considerably higher, insofar as these numbers rest on some powerful simplifying assumptions and fail to incorporate the full range of potential damage likely to result from increases in atmospheric CO<sub>2</sub>. Nonetheless, in 2016 the Bureau of Land Management used this estimate to determine that the external, climate-related costs resulting from logging on the forests it manages in Oregon are more than four times the value of the logs produced.<sup>6</sup>

The Trump Administration downplayed the concept that CO<sub>2</sub> emissions cause economic damage. President Biden, however, has ordered the agencies to reinstate \$50 per metric ton on an interim basis, and to recalculate the social cost of carbon dioxide using scientific findings that have emerged since 2016, with a revised estimate due in 2022.<sup>7</sup>

Since 2016, researchers not subject to President Trump’s restrictions have continued to develop new estimates of the social cost of carbon dioxide, using updated assumptions and data. One prominent study, published in 2018, found that each metric ton of CO<sub>2</sub> added to the atmosphere will impose economic damage of \$417, and perhaps as high as \$800.<sup>8</sup> Another, submitted for publication in 2021, concluded that the social cost of carbon dioxide is at least \$562 and perhaps \$3,319 per metric ton.<sup>9</sup> Until the federal agencies publish their new findings, these estimates of the social cost of carbon dioxide – \$50 at the lower end, up to \$3,319 at the upper end – provide the basis for developing provisional estimates of the climate-related external costs imposed on society by timber production on the lands managed by ODF.

Multiplying the lower bound of the social-cost estimates times the expected level of CO<sub>2</sub> emissions indicates that it would be reasonable to anticipate that logging on ODF-managed lands in FY2019 imposed external costs of at least \$125 million (Figure 1, column B). This amount offsets about 90 percent of ODF’s FY2019 timber-sale revenues, \$140 million. In other words, when one considers the lowest estimate of climate-related external costs, logging on ODF-managed lands in FY2019 contributed just \$15 million, not \$140 million to economic well-being.

The estimates of the social cost of carbon dioxide higher than \$50 per metric ton show it is reasonable to anticipate that the FY2019 logging will have large, overall negative impacts on societal well-being. With the estimates of the social cost from the 2018 study, \$417 – \$800 per ton, the external costs for FY2019 will exceed the value of the logs by \$902 million – \$1,860 million (Figure 1, column C). With the estimates of the social cost from the 2021 study, \$562 – \$3,319 per ton, the external costs for FY2019 will exceed the value of the logs by \$1,265 – \$8,158 million (Figure 1, column D). These numbers indicate it would be reasonable to expect that the

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<sup>5</sup> [EPA Fact Sheet: Social Cost of Carbon](#).

<sup>6</sup> U.S. Bureau of Land Management. 2016. [Proposed Resource Management Plan, Final Environmental Impact Statement: Western Oregon, Vol. 2](#).

<sup>7</sup> The White House. 2021. [Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis](#).

<sup>8</sup> Ricke, K., Drouet, L., Caldeira, K., and Tavoni, M. (2018). [Country-Level Social Cost of Carbon](#).

<sup>9</sup> Kikstra, J., P. Waidelich, J. Rising, and others. 2021. [The Social Cost of Carbon Dioxide Under Climate-Economy Feedbacks and Temperature Variability](#).

climate-related, external costs will be at least 7.4 times the value of the logs and, perhaps, 59.3 times the value of the logs.<sup>10</sup>

Climate-Related External Costs from Log Production on ODF-Managed Lands...			
A	B	C	D
Estimate of the Social Cost of CO <sub>2</sub> (\$/metric ton)	\$50 (Biden Interim)	\$417 - \$800 (Ricke et al. 2018)	\$562 - \$3,319 Kikstra et al. 2021)
CO <sub>2</sub> Emissions, FY2019 (metric tons)	2.5 million	2.5 million	2.5 million
Climate-Related External Cost	\$125 million	\$1,042 - \$2,000 million	\$1,405 – \$8,298 million
...Versus the Value of the Logs			
Value of Logs (FY2019 Timber-Sale Revenue)	\$140 million	\$140 million	\$140 million
Net Social Benefit or Cost (Revenue Minus External Cost)	\$15 million	\$902 – \$1,860 million	\$1,265 – \$8,158 million
Ratio: External Cost-to-Log Value	0.9	7.4– 14.3	10.0 – 59.3

**Figure 1: Recent Research Indicates the Climate-Related External Costs Resulting from Timber Production Far Exceed the Value of the Logs Produced**

There is a high likelihood that the negative impacts on societal well-being will be even greater than those shown in Figure 1. This conclusion is supported, for example, by more than 11,000 scientists who warned in 2019 that we now are facing a climate emergency that threatens human existence:

*“[W]e declare, with more than 11,000 scientist signatories from around the world, clearly and unequivocally that planet Earth is facing a climate emergency. ... The climate crisis has arrived and is accelerating faster than most scientists expected.... It is more severe than anticipated, threatening natural ecosystems and the fate of humanity....”<sup>11</sup>*

In 2021, almost 14,000 scientists expanded the warning, concluding that the climate emergency is even more dire than previously expected, and calling for immediate, transformative action to slow and halt catastrophic trends:

*“On the basis of recent trends in planetary vital signs, we reaffirm the climate emergency declaration and again call for transformative change, which is needed now more than ever to protect life on Earth and remain within as many planetary boundaries as possible. The speed of change is essential....”<sup>12</sup>*

Given these warnings, it appears that ODF will continue to significantly exacerbate the climate crisis – with climate-related costs far exceeding the value of the logs produced – unless it

<sup>10</sup> It is important to note that, whichever study is used to estimate the climate-related external costs, the actual costs will be larger insofar as, despite all the climate-related research completed to date, none of the available methods fully incorporates all the expected costs resulting from CO<sub>2</sub> emissions. For example, they do not yet fully account for the costs associated with ocean acidification or for the potentially catastrophic costs expected to materialize if global warming causes ocean currents or other natural systems to cross so-called tipping points so they no longer function as they have for millions of years.

<sup>11</sup> Ripple, W.J., et al. 2019. [World Scientists’ Warning of a Climate Emergency](#).

<sup>12</sup> Ripple, W.J. 2021. [World Scientists Warn of a Climate Emergency](#).

implements transformative changes to reduce or eliminate CO<sub>2</sub> emissions from its timber-production program as quickly as possible. Continued timber production will have a net, negative impact on overall societal well-being.

## 2. THE COSTS BORNE BY TODAY’S CHILDREN

The imperative for implementing transformative changes soon is highlighted by the results from a recent analysis that estimates the costs climate change will impose on today’s children. To help in its deliberations in a lawsuit seeking to halt expansion of a coal mine, a Federal Court in Australia asked an independent expert witness to describe the costs that foreseeable changes in climate will impose on the country’s children over their lifetime. The expert looked at just three of the many types of climate-related costs: (1) reductions in home values resulting from increased probability of wildfires and other risks, (2) reductions in earnings as workers and farmers experience lower productivity in response to more intense heatwaves and other climate impacts, and (3) negative health impacts resulting from higher temperatures. The analysis found that if current trends in the atmospheric levels of greenhouse gases continue, each of today’s children will experience costs of about \$126,000 over their lifetime because of just these three impacts of climate change.<sup>13</sup>

This analysis provides useful insights into the economic importance of the climate-related external costs that will result from future timber production on ODF-managed lands. The analysis indicates that, unless steps are taken to markedly reduce increases in atmospheric CO<sub>2</sub>, just three types of climate impacts will impose costs of \$126,000 onto each of the Oregonians currently under age 18.<sup>14</sup> For this group as a whole and over their lifetime, the total cost will total almost \$110 billion (Figure 2). Changes in climate will impose costs through more than just the three pathways, so the total costs will be much higher.

<b>No. Oregonians Under Age 18</b>	864,636
<b>Climate-Related Costs Each Will Experience Over Lifetime</b>	\$126,000
<b>Total</b>	\$108.9 bil.

**Figure 2. Costs To Today’s Oregonians Under Age 18, Over Their Lifetime, from Three Types of Climate Impacts If Current Trends Continue**

The Australian court’s recognition of these findings highlights some of the economic consequences that could follow if ODF were to markedly reduce or eliminate its timber-production program.<sup>15</sup> The court declared that, although withholding governmental approval for the mine, by itself, would not free today’s children from all these costs, it would be consistent with the government’s obligation to protect children from climate-related harms. Specifically, withholding approval for the mine would provide benefits for today’s children through two pathways. One, it would ensure that the incremental increases in CO<sub>2</sub> emissions, which would result if government approved the mine, will not intensify the climate harms today’s children will experience from emissions elsewhere. Two, it might show the way and

<sup>13</sup> Mallon, K. 2020. [Independent Expert Report by Dr. Karl Mallon](#). Amount shown in U.S. dollars, equivalent to the original estimate in Australian dollars.

<sup>14</sup> U.S. Census Bureau. 2021. [QuickFacts: Oregon](#).

<sup>15</sup> Readfern, G. 2021. [Australian Government Must Protect Young People from Climate Crisis Harm, Court Declares](#).



facilitate taking other appropriate actions to reduce CO<sub>2</sub> emissions that otherwise would harm today's children.

Similar reasoning applies to ODF's timber-production program. Continued production of timber will indicate disregard for the resulting increase in atmospheric carbon dioxide and the resulting intensification of harm imposed on today's children. It also will indicate that ODF is unwilling to step forward and provide leadership in the effort to reduce the risk of catastrophic climate outcomes. But, if ODF were to markedly curtail or eliminate the timber program, it would decrease or eliminate the program's incremental CO<sub>2</sub> emissions, and thereby not intensify the climate harms today's children will experience from emissions elsewhere. In addition, significant curtailment or elimination of the program and its emissions might show the way and facilitate similar actions by others, and thereby accelerate and multiply the reductions in emissions and harms borne by today's children.

## **B. EXTERNAL COSTS FROM IMPACTS ON BIODIVERSITY AND ECOSYSTEMS**

Industrial timber production on lands managed by ODF generates external costs not just by intensifying the climate crisis but also by contributing to the crisis in biodiversity and ecosystems. This latter crisis has received much less attention than climate, but it is also severe and an existential threat to human life as we know it.<sup>16</sup> Evidence for the harms associated with loss of biodiversity and ecosystems has emerged from research conducted and compiled by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which stands parallel to the comparable institution, the Intergovernmental Panel on Climate Change (IPCC).<sup>17</sup>

The biodiversity/ecosystem crisis is occurring across the globe, and here in Oregon. Concern about biodiversity and ecosystems arises from research that shows nature makes countless contributions to human well-being, but its capacity to continue providing these so-called ecosystem services is diminishing at an unprecedented rate. This decline is more than worrisome because more than one-half of the economic activity measured by conventional indicators, such as the world's gross domestic product (GDP) is dependent on ecosystem services from nature.<sup>18</sup> Globally, about one-third of the world's forest area has been destroyed, more than 85 percent of wetlands have been lost, one-third of the topsoil has been degraded, freshwater species and vertebrate species have experienced population declines of 83 percent and 60 percent, respectfully, since 1970. These losses and trends create societal and economic risks through their impacts on global health, global peace, intra- and international trade, gender equity, cultural and social connections between ecosystems and indigenous communities, and economic development. A major driver of these losses and trends has been the industrial exploitation of ecosystems to produce wood products and other materials. Industrial timber production, which is more dependent upon ecosystems than many other industries, is among the greatest contributors to the biodiversity/ecosystem crisis.

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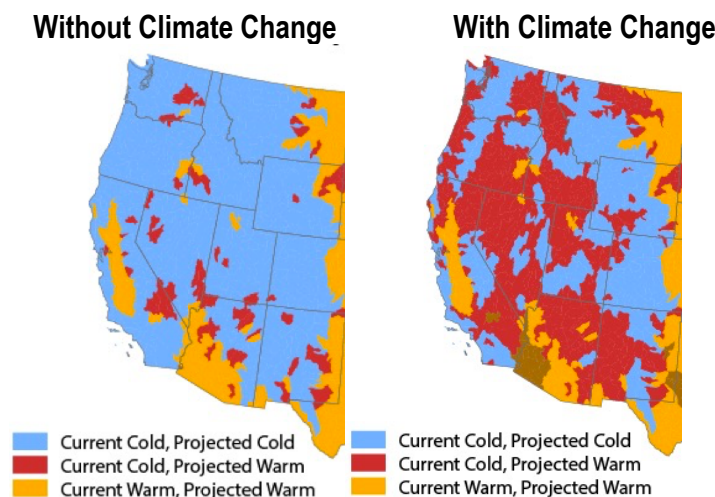
<sup>16</sup> A just-published peer-reviewed report from a panel of 50 of the world's leading biodiversity and climate experts states: "Biodiversity loss and climate change are both driven by human economic activities and mutually reinforce each other. **Neither will be successfully resolved unless both are tackled together.**" [Bold emphasis added.]

<sup>17</sup> For more information about the IPBES, please see the [home page](#).

<sup>18</sup> Support for the facts in this paragraph come from World Economic Forum. 2020. [Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy](#).

Industrial timber production in Oregon imposes negative impacts on biodiversity and ecosystems. Many of the negative impacts on biodiversity and ecosystems follow from practices that include mechanized logging, which removes the majority of forest stands on a parcel and replaces them with single-aged stands of conifers (referred to as “regeneration harvest” or “variable retention harvest,” but commonly known as clearcut logging), a core feature of industrial timber production in this region. For example, this practice has negative impacts on nature by reducing the flow of streams in late summer and raising the water temperature.<sup>19</sup> These effects can increase the likelihood that streams will experience algae blooms that create health risks for recreationists and their pets who come in contact with the water, and increase the cost of providing safe drinking water to communities downstream.

These negative impacts on streamflows also can play a role in reducing populations of salmon and other species that depend on cold water, and increase the cost of restoring these populations to higher levels.<sup>20</sup> Timber production can have negative impacts on salmon and other cold-water species directly, through the impacts of timber-management on stream flows and temperatures, and indirectly, by increasing atmospheric CO<sub>2</sub> and intensifying the impacts of the climate crisis on stream temperatures. Research from EPA confirms that, if left unchecked, changes in climate will raise stream temperatures enough to eliminate, throughout most of the state, the cold-water habitat salmon require (Figure 3). ODF’s timber-production program, thus, contributes to the warming effects of changes in climate and exacerbates the impacts by diminishing streamflows and exposing them to warm sunlight.



**Figure 3. Climate Change Is Raising Stream Temperatures and Eliminating Habitat Required by Salmon and Other Cold-Water Fish Across Much of Oregon**

ODF has not published an estimate of the value of the external costs resulting from its impacts on salmon. There can be no doubt, however, that the external costs exist: a 2009 analysis by a team of regional economists estimated that anticipated declines in Washington’s salmon populations resulting from climate change would impose costs of \$175 – \$640 per household per

<sup>19</sup> Perry, T.P., and J.A. Jones. 2017. [Summer Streamflow Deficits from Regenerating Douglas-fir Forest in the Pacific Northwest, USA](#); and Oregon State University. 2011. [Study Outlines Stream Temperature Changes Following Timber Harvests](#). Referring to Groom, J.D. 2013. Stream Temperature Responses to Timber Harvest and Best Management Practices

<sup>20</sup> National Marine Fisheries Service, West Coast Region. 2016. [Final ESA Recovery Plan for Oregon Coast Coho Salmon \(\*Oncorhynchus kisutch\*\)](#).



year.<sup>21</sup> These numbers also apply to Oregon's 1.6 million households, with a total, statewide cost of about \$280 million – \$1.0 billion. Timber production on lands managed by ODF increases the probability – the risk – that these costs will materialize.

Other negative impacts on biodiversity and ecosystems also impose external costs on all the people. Smoke from burning post-logging slash can harm the health of humans, livestock, and wildlife, for example. Clearcuts and forest roads established to support timber production can become precursors for landslides. Logging of large, old trees degrades habitat for northern spotted owls and other species dependent on these trees. Discouraging the growth of brush and other vegetation that might compete with seedlings can devastate biological diversity. Each of these actions, and others that comprise biodiversity and ecosystems' ability to provide services, generate external costs via global and local processes that negatively affect health, peace, intra- and international trade, gender equity, cultural and social connections between ecosystems and indigenous communities, and economic development.

Global efforts to quantify the external costs from negative impacts on biodiversity and ecosystem services have only just begun (they lag behind analogous efforts to quantify the social cost of carbon dioxide, described above). The preliminary evidence suggests that they are huge. For example, the loss of biodiversity and degradation of ecosystems can contribute to the emergence of devastating diseases, the degradation of forest wetlands can diminish their ability to retard, even arrest wildfires, and industrial modification of ecosystems can diminish soils and degrade their productivity.<sup>22</sup>

The global research suggests it would be prudent to expect that the external costs from the negative impacts on biodiversity and ecosystem services of timber production is equal to or greater than 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."<sup>23</sup>  
[bold emphasis added]*

ODF's counterpart, Washington's Department of Natural Resources (DNR), has confirmed this conclusion. 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 – DNR concluded that the benefits of protecting the habitat are 2-5 times the benefits from logging.<sup>24</sup>

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<sup>21</sup> Niemi, E. K. Baird, W. Barnes, and others. 2009. [An Overview of Potential Economic Costs to Washington of a Business-As-Usual Approach to Climate Change](#).

<sup>22</sup> UN Environment Programme. 2021. [Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies, Executive Summary](#).

<sup>23</sup> Bradbury, R.B., S.H.M. Butchart, B. Fisher, and others. 2021. [The Economic Consequences of Conserving or Restoring Sites for Nature](#).

<sup>24</sup> Krug, D., 2007. [Preliminary Economic Analysis: Forest Practices Rulemaking Affecting Northern Spotted Owl Conservation](#). Olympia, WA: Department of Natural Resources.

In other words, the global findings indicate that the biodiversity/ecosystem-related external costs from timber production in FY2019 will be at least as large as the benefits from these actions, i.e., the value of the logs produced, \$140 million. DNR's findings specific to northern spotted owls suggests that the biodiversity/ecosystem-related external costs could be 5 times greater, or \$700 million. The net result: ODF gives a biased, incomplete assessment of its impacts on Oregonians when it states: "Timber sales on these forests produce jobs and revenue that funds counties, local districts, and schools throughout the state."<sup>25</sup> It is important to recognize that these revenues come at great external costs that greatly exceed revenues if fully accounted. Greater value would be derived from ODF-managed lands if ODF fully took into account not just the revenue generated from logging but also the costs imposed, and sought to achieve maximum net benefit. The current practice of ignoring the external costs while highlighting logging revenue is economically inefficient and operates to the detriment of Oregonians as a whole.

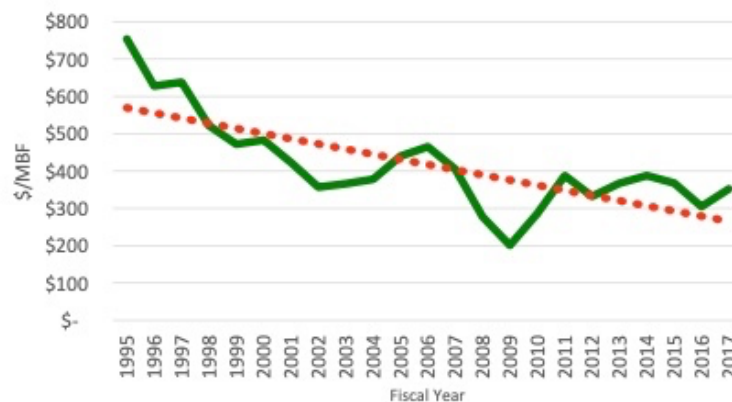
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<sup>25</sup> ODF, 2021. [State Forests: About.](#)

## II. NEGATIVE IMPACTS ON RESOURCES MANAGED BY ODF

The preceding section shows that, by exacerbating the climate and the biodiversity/ecosystem crises, industrial timber production on lands managed by ODF has negative impacts on many resources located in or dependent on these lands. Continued timber production likely will have negative impacts on the future value of resources managed by ODF, retarding growth in, or even generating absolute declines in the value of these resources. Continued timber production, for example, likely will increase the risk of wildfire on these lands, slow forest growth, degrade the quantity and quality of streams, and contribute to the loss of habitat for salmon and other species. Producing timber likely will yield markedly lower returns than would be realized by managing them for conservation and restoration.

ODF does not publish statewide data on log prices, but Washington's DNR does. The data show that the stumpage price of logs has exhibited long-term decline since FY1995 (Figure 4). It seems reasonable to assume that, although the actual prices in the two states might differ, the long-term trends in prices apply equally. Moreover, it seems reasonable to assume there is a sizeable risk that the prices ODF receives for the logs it produces will continue to decline.



**Figure 4. Stumpage Prices for Timber Sold from Washington's Trust Lands Have Been Declining**

More important, strong evidence indicates a high risk that the rate of return on ODF's investments in timber production will fall far short of the rate of return that would result from managing the lands for conservation and restoration. This evidence comes most recently from the findings of a landmark assessment, commissioned by the UK government and with support from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).<sup>26</sup> The assessment examined the performance of timber and other industries that extract materials from ecosystems around the globe and concluded that, regardless of focus or location, they typically exhibit a financial rate of return of about 5 percent. Perhaps more important, this assessment expects the rate of return for timber and other extractive industries will stagnate or

<sup>26</sup> HM Treasury. 2021. [The Economics of Biodiversity: The Dasgupta Review](#).

decline. It reaches this conclusion after reviewing catalogs of scientific and economic research regarding the economic consequences of the biodiversity/ecosystem crisis (described above) that arises because human actions “have degraded the biosphere to the point where the demands we make of its [ecosystem] goods and services far exceed its ability to meet them on a sustainable basis.”

In other words, humans have so degraded nature that it no longer can sustain past and current levels of production of timber and other materials. This degradation comes from more than just the emission of greenhouse gases and the obliteration of biodiversity. It also includes soil degradation, the emission of toxic pollutants, modifications to stream flows, elimination of wetlands, and more. Moreover, the degradation has become a worldwide reality, so there is no opportunity for an industry to exhaust the extraction of materials in one location, then move to another that has been untouched, and enjoy transitory higher levels of productivity. This reality, thus, is a major component of the biodiversity/ecosystem crisis: as nature becomes more degraded, ecosystems provide fewer services, suppressing the productivity of timber and other extractive industries. Insofar as these global relationships apply to the lands managed by ODF, it is reasonable to anticipate that the rate of return from timber production on them will remain stagnant or, more likely, decline.

Research locally confirms this conclusion. Notably, climate researchers have long recognized that increases in atmospheric CO<sub>2</sub> are expected to have these impacts:

*“Past studies have shown the overwhelming importance of the summer drought and extreme plant moisture stress on the distribution of tree species and productivity of forest ecosystems in the Pacific Northwest. It is highly likely, therefore, that climatic changes which 1) increase the length of the summer moisture deficit, 2) increase the intensity of the summer moisture deficit, or 3) increase the frequency of multiple summer droughts – or any combination of the three – **will result in a reduction in forest cover and biomass and in loss of species at the dry end of their ranges.** ... Consequently, even with increased total annual precipitation or increased WUE [water use efficiency], **any climatic changes (such as reduced summer precipitation or increased summer temperature) that result in a net increase in soil and plant moisture deficits are likely to result in increased physiological stress and reduced productivity.**”<sup>27</sup> [Citations omitted. Bold emphasis added.]*

In sum, with continued timber production, the productivity and value of the resources managed by ODF will decline. Additional decline in productivity and value will occur for resources, such as downstream salmon populations, that are linked to ODF-managed resources. It is reasonable, therefore, to ask if a greater emphasis on conservation and restoration would yield better outcomes. ODF has not quantified the rate of return for these activities, but there are strong reasons to conclude that they generally will outperform the rate of return from continued production of timber. The study commissioned by the UK government, described above, shows that investments in conservation and restoration typically yield a rate of return greater than 19 percent, almost four times greater than the rate of return on timber production and other forms of resource exploitation. This estimate of the superior performance of conservation and restoration is consistent with the research, described above, that found “both

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<sup>27</sup> University of Washington, JSIAO Climate Impacts Group. 1999. [Impacts of Climate Variability and Change in the Pacific Northwest](#).

conservation and ecological restoration bring considerable net benefit.”<sup>28</sup> Both of these findings stand in sharp contrast with the discussion in the preceding section, which shows that continued timber production likely will generate external costs far greater than benefits.

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<sup>28</sup> Bradbury, R.B., S.H.M. Butchart, B. Fisher, and others. 2021. [The Economic Consequences of Conserving or Restoring Sites for Nature](#).



### III. MORE CONSERVATION AND RESTORATION CAN BOLSTER JOBS, INCOMES, AND LOCAL ECONOMIES

Representatives of the timber industry and its supporters often have asserted that deviation from timber production would reduce revenues for beneficiaries and have negative, perhaps severe, economic consequences for communities and workers. ODF, itself, makes these claims.

The economic facts, however, reveal a vastly different truth. These facts show that, instead of creating jobs, boosting local economies, and providing a foundation for sustained prosperity in local communities, the timber industry has destabilized and depressed local economies by eliminating jobs and fostering unhealthy social conditions in local communities. Moreover, the facts show it has had these job-destroying, destabilizing, depressing impacts for decades. For example, Oregon’s mining and logging industry and wood processing industry have eliminated jobs throughout the past 30 years, averaging almost 1,000 jobs per year over the period (Figure 5).<sup>29</sup>

	1990	2020	1990–2020
Mining & Logging	13,000	6,700	-6,300
Wood Products Manufacturing	46,100	23,000	-23,000
Total	59,100	29,700	-29,300

**Figure 5. Oregon’s Employment in Mining & Logging and Wood Products Manufacturing Has Declined Almost 1,000 per Year for the Past 30 Years**

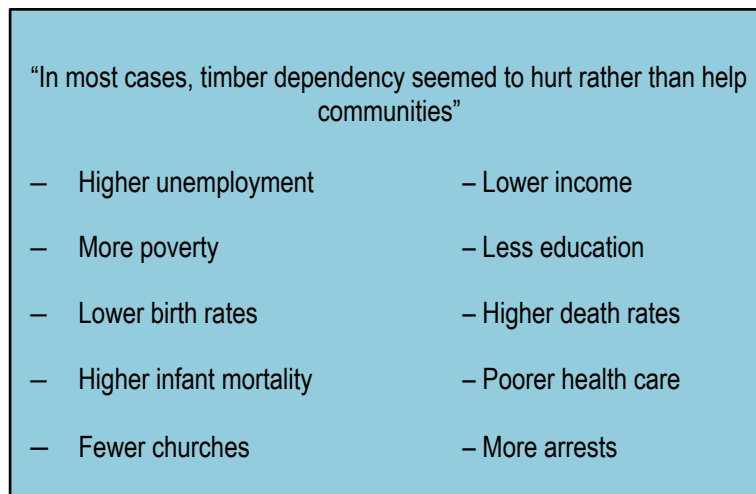
These declines come as no surprise. Evidence presented in the preceding section shows that log prices have been declining for decades. Facing this reality, the timber industry aggressively strives to cut costs, most notably by eliminating jobs. Thus, rather than being a pillar of continued job opportunities for rural workers and stability for the economy, the timber industry is a major source of decline and instability.

The negative economic impacts of timber production extend beyond timber-industry workers to the communities where the industry and its workers reside. Extensive research has documented the industry’s negative impacts on local communities. Much of this research occurred in response to the decline in logging on federal lands in the Pacific Northwest during the 1990s. A summary of this research, compiled by the National Research Council, concluded that a higher concentration of timber-related activity “seemed to hurt rather than help communities” (Figure 6).<sup>30</sup> Much of this “hurt” comes directly from the industry’s impacts on workers. Eliminating jobs in the timber industry, for example, can have ripple effects that increase unemployment and the incidence of families in poverty throughout the local community. These outcomes can diminish activity within the local economy, diminish tax revenues for local communities, and

<sup>29</sup> St. Louis Federal Reserve. 2021. [All Employees: Mining and Logging in Oregon](#); and [All Employees: Durable Goods: Wood Products Manufacturing in Oregon](#).

<sup>30</sup> National Research Council. 2000. *Environmental Issues in Pacific Northwest Forest Management*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/4983>.

stimulate communities to divert resources from other programs to provide public services to the affected families. Note that, although the research underlying Figure 6 comes from the 1990s, when logging on federal lands declined, most of the jobs eliminated, shown in Figure 5, occurred afterward and reflect industry’s protracted determination to reduce labor costs.



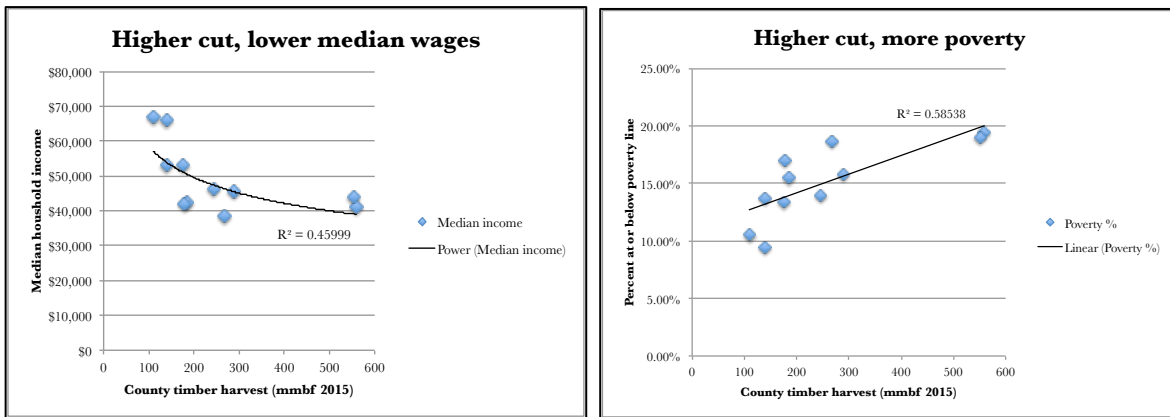
**Figure 6. Summary of Research Findings Regarding the Timber Industry’s Influence on Community Well-Being**

The negative relationship between timber and the social health of communities, shown in Figure 6, was reaffirmed recently by the Bureau of Land Management (BLM), which examined the relationship between log production and local economies. It found that the timber industry is among the world’s most volatile and this volatility has negative spillover impacts on local communities. As a result, the BLM concluded that proposed increases in log production likely would destabilize, rather than stabilize, the economy of nearby rural communities.<sup>31</sup>

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 7).<sup>32</sup>

<sup>31</sup> Bureau of Land Management, 2014. Final Environmental Impact Statement for the Proposed Resource Management Plan for Western Oregon, page 702. Portland, OR: USDI Bureau of Land Management, Oregon State Office.

<sup>32</sup> 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 7. In Counties in Western Oregon with Significant Timber Harvest, More Logging Correlates with Lower Wages and More Poverty.**

The discussion above undercuts ODF’s boast that its timber-production program has positive economic impacts. The facts support the conclusion, that, if it continues to emphasize timber production, ODF likely will not foster robust economic outcomes for workers, families, and communities. Instead, the production of timber will, instead, likely contribute to persistent economic and social decline.

Would the outlook be different if ODF curtailed or eliminated timber production and managed with an emphasis on conservation and restoration? Substantial evidence says, “Yes!” Research reaching back over several decades indicates that this change in emphasis 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.”<sup>33</sup> 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.”*

<sup>33</sup> 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->

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 between 2005 and 2011, a period that includes a major recession and contraction for most industries.<sup>34</sup> ODF might stimulate activity in this industry by managing forests to provide more recreational opportunities rather than converting them into stumps. 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 local economy.

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.”<sup>35</sup>*

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 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).<sup>36</sup>

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*

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<sup>34</sup> Outdoor Industry Association. 2021. [The Outdoor Recreation Economy](#).

<sup>35</sup> McGranahan, D.A. 1999. [Natural Amenities Drive Population Change](#).

<sup>36</sup> Rasker, R., Gude P.H., and Delorey, M., 2013. [The Effect of Protected Federal Lands on Economic Prosperity in the Non-Metropolitan West](#).

*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, 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.”<sup>37</sup> [Citations omitted]*

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

The researchers who produced this last review also described the factors that have discouraged ODF and 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 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 potential in-migrants, recreationists, and tourists, the lands managed by ODF 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. By shifting its focus to conservation and restoration, ODF can help nearby communities and rural residents have access to these realities. If it continues to focus on log production, however, it will continue laying the foundation for more economic decline and instability.

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<sup>37</sup> Hjerpe, E., A. Hussain, and T. Holmes. 2020. [Amenity Migration and Public Lands: Rise of the Protected Areas](#).