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May 2019 **REPORT**

ENVIRONMENTALLY HARMFUL SUBSIDIES IN THE U.S.

Issue #1: The federal logging program

How damaging logging operations on federal public lands costs taxpayers nearly $2 billion each year

Subsidized commercial logging under the guise of fire risk reduction makes forests hotter, drier, and more susceptible to climate change. Photo credit: US Forest Service.

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Issue #1 - The federal logging program

By John Talberth, Ph.D. and Ernie Niemi

KEY FINDINGS

"Our analysis finds that the logging program on federal forests continues to lose money for taxpayers in the range of $1.5 to $2.0 billion per year."

"Congress can remedy this situation by restricting use of appropriated funds for vegetation management on national forest and BLM lands to ecological restoration projects that are decoupled from commercial logging."

- Each year, the US Forest Service authorizes logging of roughly 3 billion board feet of timber – equivalent to 650,000 full log truck loads – from national forest lands.
- This logging comes at a steep environmental cost in the form of loss of biological diversity, damage to water supplies, and increased risks from wildfires, flooding, and climate change.
- The federal logging program comes with steep economic and financial costs as well. In particular, national forest logging displaces uses and functions such as carbon storage, recreation and water filtration that are far more valuable than timber. And because the Forest Service sells its timber far below cost, it results in significant taxpayer losses.
- In two previous assessments that applied a methodology reviewed by the Congressional Research Service, the John Muir Project found annual taxpayer losses of nearly $1.2 billion per year between fiscal years 1997 and 2004, $1.7 billion in 2018 dollars.
- This report updates the John Muir Project methodology by comparing timber sale program receipts deposited into the US Treasury with Forest Service logging related expenditures during fiscal years 2013 to 2017.
- Our analysis finds that the logging program on national forests continues to lose money for taxpayers in the range of $1.3 to $1.5 billion per year.
- When additional federal logging subsidies related to fire suppression and BLM losses are included, the total exceeds $1.8 billion per year.
- As such, the federal logging program runs afoul of international agreements and ambitions to phase out environmentally harmful subsidies and make international trade more economically efficient.
- Congress can remedy this situation by restricting use of appropriated funds for vegetation management on national forest and BLM lands to ecological restoration projects that are decoupled from commercial logging.

ABOUT THIS SERIES

"International institutions have active programs to phase out environmentally harmful subsidies and redirect state support, instead, to alternatives that advance triple bottom line goals for sustainable development."

Rescinding and redirecting environmentally harmful subsidies have long been recognized as effective tools for advancing a global sustainable development agenda and making global trade regimes more efficient. Subsidies for fossil fuels, mining, logging, industrial agriculture, factory fishing and other activities that pollute land, air and water and drive climate change run in the trillions of dollars each year. Fossil fuel subsidies by themselves were found to approach $5 trillion annually by a recent International Monetary Fund (IMF) assessment while subsidies for other sectors add at least another $1 trillion.[1] International institutions such as the Organization for Economic Cooperation and Development, Convention on Biological Diversity and IMF have active programs in place to work with governments to identify and phase out these harmful subsidies and redirect state support, instead, to alternatives that advance triple bottom line goals of economic prosperity, equity, and ecological sustainability.

This report series considers environmentally harmful subsidies (EHS) in the United States beginning with an analysis of federal and state-level subsidies for timber. The US is the world's largest producer and consumer of wood products but also has some of the most productive forestlands that can play a major role in mitigating climate change if managed for long term carbon storage and restoration of natural forest conditions. Instead, logging subsidies support carbon intensive forest practices like short rotation clearcutting and the conversion of natural forests into tree plantations. The first two reports in this series consider subsidies for logging on federal public lands and a wide range of state-level tax advantages and subsidies that support industrial forest practices on privately managed timberlands. This issue is devoted to an analysis of logging subsidies on federal public lands, with a focus on national forests managed by the US Forest Service, an agency of the United States Department of Agriculture (USDA).

NATIONAL FORESTS PLAY A UNIQUE ECOLOGICAL ROLE

"These lands play a unique ecological role because they represent islands in a sea of heavily damaged lands managed by states and private landowners."

The USDA Forest Service manages 144 million acres of forestland in the US, about 19% of the 765 million acre total. These lands play a unique ecological role because they represent islands in a sea of heavily damaged lands managed by states and private landowners. They support the few remnants of native forest ecosystems that have not been converted to industrial tree plantations or otherwise damaged by logging, grazing, mining, roads, development and other human activities. They are the headwaters of streams and rivers vital for drinking water, irrigation, and industry. They support wildlife, fish, and plant species that provide valuable services to our economy in the form of foods, medicines, and ecosystem services such as pollination. They provide the lion's share of forested recreational opportunities. And they are critical for capturing and storing carbon and helping humanity bend the curve on carbon dioxide concentrations in the atmosphere back below the scientific upper limit safe zone of 350 parts per million.

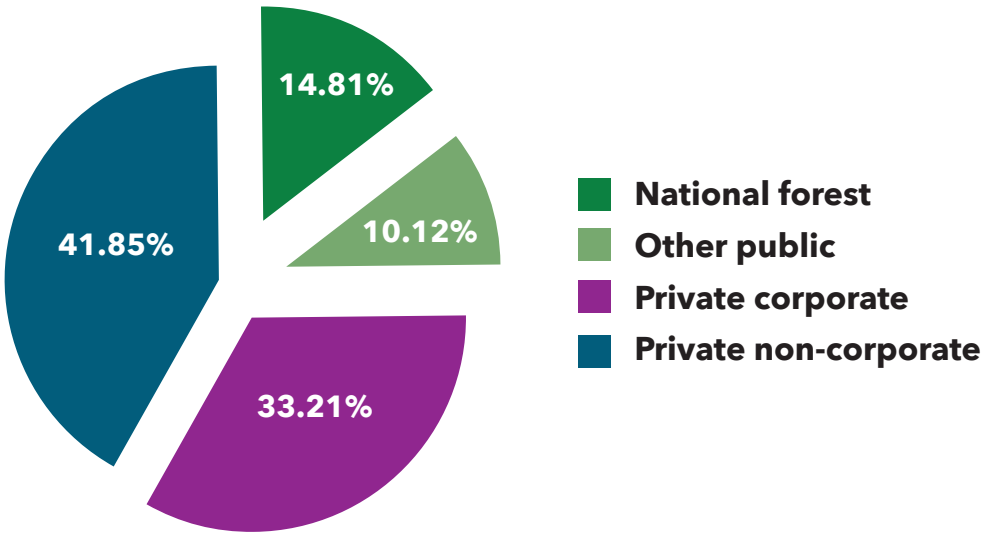
There are two key reasons why national forests retain their relatively valuable role. The first is that, in general, national forest lands are steeper,

higher in elevation, less accessible and less productive than lands managed by states and private landowners. As such, they represent the lands left over after settlers and private industry took the most productive and accessible lands for themselves. This can be seen by considering the distribution of forest productivity among the forestland ownership types. As Figure 1 shows, 85% of the most productive lands – those that have the potential to grow over 120 cubic feet per acre per year – fall outside national forest boundaries. Because national forestlands are less productive, they have been historically less attractive for commercial logging.

"85% of the most productive lands – those that have the potential to grow over 120 cubic feet per acre per year – fall outside national forest boundaries."

Figure 1

Ownership share of high productivity (+120 cubic feet/acre/year) timberlands in the US



As a result, significant tracts of national forestlands have escaped the chainsaw – so far.

"One of the key justifications for ending the logging program on national forests is so they can serve as a buttress against the extinction threat posed by industrial tree plantations."

The second reason why national forests have remained relatively intact is that the laws governing national forests and other federal forestlands are far more accommodating to non-timber uses such as recreation, hunting, fishing and conservation of wildlife, fish and water quality. Federal laws mandate that significant amounts of the land base be set aside for these resources. In contrast, the laws governing the management of state and private forest lands emphasize timber production above all else and have few requirements for set asides to protect these resources and uses. As a result, a typical landscape within the industrial forestland matrix supports little to no habitat for most native species of wildlife, fish and plants and, instead exists as a sea of industrial tree plantations. The area occupied by timber plantations is growing, threatening more biodiversity loss. One of the key justifications for ending the logging program on national forests is so they can serve as a buttress against this extinction threat.

BECAUSE OF THEIR UNIQUE ROLE AND LIMITED SUITABILITY, LOGGING ON NATIONAL FORESTLANDS IS UNECONOMICAL

"As shown by Figure 2, carbon beats out timber on both national forests by a large margin. Even at a high discount rate (which tends to inflate timber values relative to long term carbon storage) management of the land for carbon storage yields two to three times the present value estimate per acre than that same acre managed for timber."

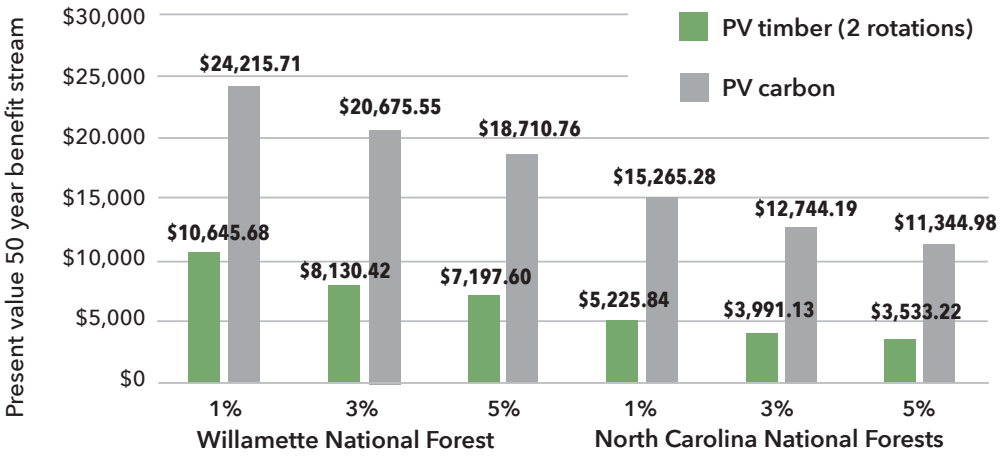
"Adding the value of recreation, water, fish, wildlife, wild pollinators makes the economic case against logging even stronger."

The unique ecological role played by national forest lands coupled with their limitations on suitability render these lands, for the most part, uneconomical to log. There are two economic dimensions to consider: economic and financial feasibility. Economic feasibility is a term used to signify whether or not an economic activity yields benefits in excess of costs for society as a whole, taking into consideration effects measured by market transactions as well as effects that are non-market in nature. Timber and other forest products have established market prices and are measurable with relative ease. Carbon, recreation, and water filtration are examples of non-market goods and services (ecosystem services) that are important economically but harder to measure. There are, nonetheless, established methods for valuing ecosystem services. An entire branch of environmental economics is dedicated to robust methods to do so. And what these studies show is that national forest lands are, in general, far more valuable managed for non-timber ecosystem services.

Figure 2 illustrates this point by comparing the present value of the benefit stream associated with managing a typical acre of land on two national forest areas – the Willamette National Forest in Oregon and the North Carolina national forests – for either carbon or timber. If the acre were managed for timber, the analysis assumes two cutting cycles over 50 years. The first cycle yields income from the sale of timber in year one and then again in year fifty. Timber values are based on actual transaction data for timber sales sold by these national forests in 2018.[2]

Figure 2

Timber vs. carbon values per acre ($2018) at discount rates of 1%, 3% and 5%



If the acre were managed for carbon, the analysis puts value on both the existing carbon stock contained in live trees and vegetation as well as the additional carbon accumulated in trees over the next fifty years. Carbon stock data were drawn from Forest Inventory and Analysis (FIA) program publications. The social cost of carbon as estimated by the EPA and other federal agencies was the basis for valuing these carbon stocks. Think of

the value as the avoided costs of emissions associated with logging if the acre were, instead, protected and allowed to grow and accumulate carbon over time. The SCC used in this analysis is $50 per ton of CO_2 which is the midpoint federal estimate at a discount rate of 3% updated to 2018 dollars. Carbon sequestration rates (the annual tons of CO_2 captured) were derived from local estimates of net ecosystem productivity (NEP), which considers all the carbon sequestered by a forest minus what it gives off through natural processes.[3]

"Using a methodology reviewed by the Congressional Research Service and found to be a "reasonable estimate" by CRS Hanson found that the national forest timber sale program lost roughly $1.8 billion ($2018) in FY 1997."

As shown by Figure 2, carbon beats out timber on both national forests by a large margin. Even at a high discount rate (which tends to inflate timber values relative to long term carbon storage) management of the land for carbon storage yields two to three times the present value estimate per acre than that same acre managed for timber. And carbon sequestration is just one ecosystem service provided by forests if allowed to grow and mature. Adding the value of recreation, water, fish, wildlife, wild pollinators makes the economic case against logging more compelling.

And then there is the financial case to consider: the fact that the federal logging program is a big money loser for taxpayers. The issue of below-cost subsidized federal timber first emerged in the 1980s with a series of reports issued by the General Accounting Office and Congressional Research Service and others. Few attempts to actually quantify the annual losses were made until a 1997 study by Chad Hanson with John Muir Project which was then updated in 1999. Using a methodology reviewed by the Congressional Research Service and found to be a "reasonable estimate" of the net cash loss, Hanson found that the national forest timber sale program lost roughly $1.2 billion during FY 1997, or $1.8 billion in 2018 dollars. Receipts generated by timber sales that were not funneled back into logging related expenses did not even come close to covering the Forest Service's logging related costs.

"Replicating most of the earlier methodology, JMP found that the situation did not change much, if at all, during the FY 1998 – FY 2004 period. The logging program on national forests continued to lose money during this period – an average logging subsidy of roughly $1.7 billion per year."

The Hanson (1999) study was followed up in 2005 by an additional analysis by John Muir Project's Rene Voss.[4] Replicating most of the earlier methodology, JMP found that the situation did not change much, if at all, during the FY 1998 – FY 2004 period. The logging program on national forests continued to lose money during this period – an average logging subsidy of roughly $1.2 billion per year, $1.7 billion in 2018 dollars.

Despite being uneconomical and a money loser for taxpayers, the national forest logging program continues, and is expected to grow larger in the coming years. The Forest Service's 2018 Budget Justification states that the agency's goal is to increase the amount of timber sold from 2.94 billion board feet (BBF) in 2016 to 3.8 BBF in the near future. This is equivalent to nearly 650,000 full log truck loads a year. Before we update the subsidy calculations, it is important to explain how the Forest Service justifies losing substantial taxpayer dollars and continuing to allocate lands to timber production when non-timber uses are so much higher.

YET HARMFUL LOGGING ON NATIONAL FORESTS CONTINUES TO BE SUBSIDIZED

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"The problem is that mixing commercial logging activities in with projects that would otherwise be cleanly focused on ecological objectives results in projects that often do more harm than good as well as projects that would otherwise be unnecessary."

Over the past two decades, the Forest Service – with notable exceptions in places like southeast Alaska – has moved away from justifying its logging program on the grounds that it needs to help sustain the timber industry. With unregulated access to the nation's most productive forestlands and the fact that much of what is cut on non-federal lands is exported, the public is not easily convinced that this industry needs support from taxpayers. So on most national forests, the Forest Service instead contends that timber sales are needed to achieve several important ecological goals. In particular, the agency claims that:

> Timber sales and stewardship projects can both reduce the density of trees and change the type of trees in the forest. This can improve the vigor and health of forests and improve wildlife habitat for multiple species. Additionally, timber sales and stewardship contracts can help with multiple goals, including restoring large-scale watersheds by reducing fuels that create an unacceptable fire risk, recovering timber value following natural disturbances, and preparing sites for vegetation to regenerate. Timber sales and stewardship contracts can also be used to reduce insect and disease infestations, improve resilience to drought, and improve tree growth to produce desirable timber products in the future.[5]

Thus losing money on the timber sale program is justified as necessary in order to carry out ecological restoration projects that would otherwise not occur or have to be financed at full cost. The problem is that mixing commercial logging activities in with projects that would otherwise be cleanly focused on ecological objectives results in projects that often do more harm than good as well as projects that would otherwise be unnecessary. Many thinning projects designed to reduce fire risk have been shown to actually elevate the risk because of logging slash left behind and changes in microclimates that create hotter, drier, and more open forest conditions.[6] Salvage sales ignore the ecological benefits of natural disturbances and result in widespread damage to soils that would otherwise be retained onsite to help the next generation of vegetation grow.[7]

The scientific case against Forest Service timber sales that are purported to help advance ecological goals has, time and time again, landed the agency in court and triggered protests from scientific and conservation organizations. A small sample of recent disputes include:

- **The Crystal Clear Restoration Project, Mt. Hood National Forest:** This project proposes logging of approximately 4,000 acres in order to "improve stand conditions, reduce the risk of high-intensity wildfires, and promote safe fire suppression activities."[8] However, in their comments on the project, a coalition of conservation and scientific organizations refute this claim, noting that the proposed area is in fact at low risk for fires and that logging will pose a threat to critical wildlife habitats.[9] The objectors cite that the project is within Fire Regime Condition Class 1, indicating that this area of forest is closest to its natural vegetation patterns and is of least concern for fuel, fire frequency, severity, and pattern. Nor is it on land that is designated by the Wasco County Community Wildfire Protection Plan as a priority

for fuel reduction. According to Forest Service, the project will "downgrade 1,059 acres of suitable nesting, roosting and foraging habitat and remove 895 acres of dispersal habitat" from a northern spotted owl critical habitat area.

- **Crane Point Forest Health Project – Nez Perce-Clearwater National Forest:** The Forest Service proposed to log 1,350 acres on the grounds that doing so would decrease insect and disease levels, decrease the dominance of shade tolerant species of trees, and that harvesting wood products would sustain local and regional economies.[10] However, objectors report that "clearcuts put ecological communities at the forest's edge at risk for disease," and quote the Forest Service itself claiming that "diseases which reduce timber production are certainly damaging in commercial forests…The same diseases, however, may be of little or no consequence in parks or watershed protection areas."[11]

- **French Fire Logging Project – Sierra Nevada National Forest:** The Forest Service is currently proposing to post-fire log most of the complex early seral forest in this fire area—including in Pacific Fisher habitat and occupied California Spotted Owl and Black-backed Woodpecker territories. While Pacific Fishers select dense, old forest for denning and resting, they actively use, and select, higher-intensity fire areas as foraging habitat—especially the females, for which there is the greatest conservation concern.[12]

- **Greenwood Vegetation Management Project – Daniel Boone National Forest:** The Greenwood Vegetation Management Project proposes to log 3,600 acres of the Daniel Boone National Forest to "meet desired future condition for mid-density upland forest" and make forest more resistant to disturbance.[13] The objectors note, however that "the specific justification given for timber harvesting in the Purpose and Need for woodland establishments is to create mid-density forests meeting specific basal area targets that ostensibly do not exist in the project area."[14] Additionally, objectors note that forests are already in the basal range of 30-50 ft2/ac, the goal density of this project.

- **East Side Timber Project – Allegheny National Forest:** The East Side Timber Project in the Allegheny National Forest resulted in 3,000 acres of even-aged logging in 2006, ostensibly, to improve biological diversity through even aged management. However scientific and conservation groups challenged this in court, stating that the proposed project will do the opposite. The plaintiffs cited research showing that "even-aged management would result in the least amount of old growth habitat, the highest amount of soil compaction, the lowest amount of standing dead and lying dead trees for wildlife habitat, the highest acreage of forest with more than 30% stocking of interfering ferns of all alternatives," and that uneven-aged management could "obtain adequate regeneration of diverse tree species."[15]

What these case studies illustrate is that the Forest Service's justifications for

"What these case studies illustrate is that the Forest Service's ecological justifications for subsidized logging on national forests rests on very shaky footing. Taxpayer losses are not made up for by the purported ecological benefits of logging – to the contrary, taxpayers not only lose money on national forest timber sales but see their lands further degraded."

subsidized logging on national forests rests on very shaky footing. Scientific information presented in appeals and litigation regularly challenges the idea that commercial logging is compatible with stated goals for fire risk reduction, post fire rehabilitation, biological diversity, watershed integrity and other ecological objectives. Taxpayer losses are not made up for by the purported ecological benefits of logging – to the contrary, taxpayers not only lose money on national forest timber sales but see their lands further degraded.

YET HARMFUL LOGGING ON NATIONAL FORESTS CONTINUES TO BE SUBSIDIZED

"Taxpayer losses are not made up for by the purported ecological benefits of logging – to the contrary, taxpayers not only lose money on national forest timber sales but see their lands further degraded."

This section presents the general methodology we used to update the subsidy calculations for the fiscal years 2013 to 2017. Unless otherwise noted, the calculations replicate the methodology used by John Muir Project (JMP) in their 2005 update. That methodology compares all Forest Service expenditures associated with the timber sale program to timber sale receipts deposited in the US Treasury. Expenditures are identified using the 'but for' criteria – but for the existence of the timber sale program the associated expenditure would otherwise not have been made.

Expenditure data are drawn from annual budget justifications prepared by the Forest Service for each fiscal year.[16] Forest Service timber sale expenditures can be divided into two basic categories: appropriated funds and off budget funds. Appropriated funds are line items authorized by Congress. Off-budget funds are those capitalized by timber sale revenue and spent without the need for additional authorizations from Congress.

Treasury deposits, not timber sale revenues, are the key metric indicating what financial return taxpayers receive because the vast majority of revenues generated by the sale of timber go back into funds that are used to plan, prepare, implement, and clean up after more timber sales. As such, Treasury deposits represent the actual financial benefit to taxpayers. However, the Forest Service does not report Treasury deposits directly. Instead, it reports deposits into the National Forests Fund (NFF), which is then transferred to either the US Treasury or to states (pursuant to 16 USC § 500, states receive 25% of gross receipts for national forest logging projects) for use on roads and schools in the counties where national forests are located. Regardless, payments to states are ostensibly a benefit to taxpayers and so using the NFF deposits in lieu of direct data on Treasury deposits is an acceptable alternative.

Find below a brief description of line items within the two major expenditure categories as well as the methodology used to assign the appropriate portion of the line item to the timber sale program. We also briefly discuss the source of information for the NFF deposits.

National forest timber sale program funds appropriated by Congress

Timber sales and other forest products management (TS): This is the most direct expenditure used to finance planning and preparation of timber sales. However, the line item also includes a small portion used to prepare sales of non-timber forest products sales such as edible and medicinal plants, personal use firewood, posts, and poles, and shrubs

for landscaping. That portion was estimated by JMP to represent about 2% of this line item, and so we follow suit by subtracting that amount from each year's appropriation. As discussed below, we also backed out (deducted) the portion of this line item spent on forest roads, which are reported separately here.

Vegetation and watershed management (VWM): These expenditures are purported to support landscape-level restoration but, in fact, focus on projects to enhance the timber resource including thinning, timber stand improvement, reforestation, pruning, and other tree and nursery improvement projects.[17] In addition, many expenditures not directly related to enhancing the timber resource are made to repair damages from past logging. Following the JMP methodology approved by CRS, we allocate 100% of this line item to the timber sale program.

Reforestation trust fund (RTF): This fund supports reforestation and timber stand improvement activities that would not otherwise be needed but for the timber sale program. So, this line item is allocated as a timber sale program expense in its entirety.

Hazardous fuels (HF): This expenditure supports prescribed fire, mechanical fuels reduction, and thinning activities. While the overall intent of these expenditures is to reduce risks of high intensity fires, much of the spending takes place on lands that are not priorities for fire risk reduction (i.e. wildland-urban interface zones) and supports projects such as the Crystal Clear project on the Mt. Hood National Forest that are less about fire risk reduction and more about generating commercial timber for sale. Following JMP, the share of this expenditure allocated to the timber sale program was calculated in three steps for each of the fiscal years included in our analysis: (1) removing the acres of land treated with prescribed and natural fire based on data reported in budget justifications; (2) assuming that 35% of the remaining treatment acres were treated mechanically to produce wood products, a percentage derived from prior studies, and (3) applying a cost estimate of $400 per acre ($2005) to these treatment acres, but updating the value to reflect current (i.e. current to each fiscal year) dollars. Over the FY 2013 to FY 2017 period, the average allocation to the timber sale program from this line item was just over 35%.

Forest health management – federal lands (FHF): This line item supports projects designed to eliminate or contain invasive species as well as insects and disease that are native, but which pose threats to the timber resource. While controlling invasive species is a desirable and laudable program that has little connection to the timber sale program, management of native insects such as the southern and mountain pine beetles is regularly used to justify timber sales that are difficult to defend ecologically since they involve suppression of a natural disturbance done primarily for the purpose of protecting the timber commodity. JMP backed out expenditures on insects and disease indirectly, however, it is now possible to be more precise since the Forest Service now reports the acreages assigned to invasive species and pathogens in its budget justifications. For each fiscal year in our analysis, we used these figures as a basis for assigning the share of this line item to insects and disease suppression activities. The

share ranged from a low of 53% in FY2014 to a high of 63% in FY 2017. This assumes that the unit cost of each activity – invasive species vs. insect and disease suppression are similar.

Forest roads (FR): The Forest Service provides engineering and other forms of support for road construction by purchasers of national forest timber. This line item captures those expenditures. Beginning in FY 2010, the Forest Service stopped disclosing these expenditures, which are now folded into the larger timber sales and other forest products line item. To compensate, we extracted the latest forest roads expenditure data for the fiscal years 2007 to 2009 and calculated its share of the Timber sales and other forest products line item for those years. That share averaged roughly 15% during this period. We then applied this percentage to the Timber sales and other forest products line items for FY 2013 to FY 2017.

Roads maintenance (RM): There are over 380,000 miles of roads on national forest system lands.[18] The vast majority of these were constructed to support logging operations. Each year, the Forest Service spends roughly $170 million to maintain these roads. The question is what share to allocate to non-timber uses, such as recreation. The JMP methodology does this by multiplying the road maintenance total each year by a ratio that reflects the proportion of direct expenditures on timber sales vs. spending on timber sales plus recreation (R), or: (TS+VWM+SS+OB)/(TS+VWM+SS+OB+R). We made no changes to this method.

Land and resource management planning, inventory, and monitoring (LRMP): A significant share of this line item is spent on delineating and inventorying lands suitable for timber harvest and monitoring timber sale and post-logging activities. JMP calculated this share by dividing total expenditures for logging related activities (TS+VWM+SS+OB) by this sum plus the amount spent on non-logging related programs also addressed by LRMP activities including recreation, grazing, minerals, wildlife and fish. The resultant share to logging varied between 57% and 62% over the FY 2013 to FY 2017 period.

Land ownership management (LO): These funds are used to administer national forest holdings and boundaries, which includes timber sale boundary location. Here we applied the same percentages derived in the previous land management planning, inventory and monitoring (LRMP) estimate and multiplied it by the land ownership management line item total for each year.

Timber research (TR): The Forest Service uses a significant share of funds appropriated for research to support timber sale program activities. The Forest Service's budget justifications break out various subcomponents of the research budget. The line item Resource Management and Use is the most relevant for timber sale program activities, so we include this line item in total. There are no additional sources of information to break down this line item further or assign additional funds from other research programs. The resulting share of the research budget devoted to the timber sale program averaged about 30% during the FY 2013 to FY 2017 period, a bit higher than the previous JMP estimate of 21%.

Support from other budget line items (SP): Many other budget line items contribute to the timber sale program indirectly. For example, many watershed restoration or wildlife habitat improvement projects that include logging activities (see, e.g. the East Side timber sale case study) and generate commercial quantities of timber are paid for out of funds set aside for wildlife and fish. JMP estimated the share of support from other line items to amount to 13.9% of the timber sales line item. We found no reason to adjust this amount in this update and so carried that share forward.

Off-budget expenditures for logging

These are funds that are not appropriated from the general fund of the US Treasury but are nonetheless expended in support of logging activities. Much of the funding comes from timber sale receipts retained by the Forest Service. Unless otherwise noted, each of these line items are included in their entirely since they are exclusively designed to support timber sale program activities. These expenditure line items are also published in each year's budget justification, and include:

Purchaser credit roads: Timber sale purchasers who elect to have the Forest Service build the permanent roads required in the sale contract make deposits to a special account and funds are permanently appropriated to the Forest Service to build the required roads.

Timber pipeline restoration fund: This fund includes receipts from certain canceled-but-reinstated timber sales and from additional sales prepared with the fund. These funds are permanently appropriated to the Forest Service. According to a 2011 CRS analysis, 75% of the funds are used to prepare additional timber sales and the other 25% is for recreation projects.[19] We thus include 75% of this line item as a timber sale program expenditure.

Salvage sales fund: Receipts from the sale of timber salvaged after fires or other disturbances are deposited in this account and permanently appropriated to the Forest Service, primarily to fund additional salvage sales.

Brush disposal fund: Purchasers of national forest timber sales make deposits over and above the stumpage price for the sale into this fund, which is used by the Forest Service to dispose of tree tops, limbs, and other woody debris from timber harvesting. The amount is determined for each sale.

Cooperative work trust funds: Forest Service budget justifications identify two categories of cooperative trust fund work relevant to the timber sale program: (1) Knutson-Vanderberg (KV) related, and (2) 'other.' KV funds are derived from timber sale receipts and are used for reforestation, timber stand improvement, and for protection of other resources affected by timber sales. The 'other' expenditure category includes funds collected directly from timber sale purchasers to finance other special projects within timber sale boundaries purchasers elect not to complete, such as road maintenance.

National Forest Fund deposits

After allocating timber sale program revenues to the line items that support future timber sales, the Forest Service deposits the remainder in the National Forest Fund (NFF). As noted above, these funds are, in turn, either redeposited into the US Treasury or sent back to states to fulfill statutory obligations regarding the sharing of timber sale gross receipts with counties to support roads and schools. As such, they represent the net return taxpayers receive from the timber sale program after all accounting for all costs and diversion of revenue to fund more timber sales.

NFF deposits are reported annually in the Forest Service ASR 04 report series.[20] These reports, which are available by region, by state, and by each national forest disclose NFF deposits from revenues earned through the sale of timber, grazing, land use, recreation, power, minerals and crystals. NFF receipts from each product are reported separately, and so we extracted the relevant data for timber from each fiscal year included in this update (FY 2013 – FY 2017).

RESULTS

"…during the fiscal years 2013 to 2017 the timber sale program on national forests was a net cost to taxpayers in the range of $1.34 to $1.51 billion per year, which translates into a subsidy of between $500 and $600 per every thousand board foot (mbf) logged. The average annual taxpayer loss over the five-year period was $1.41 billion."

Results for FY 2013 through FY 2017 are reported in Table 1, below (page 13). All values are expressed in 2018 dollars using the US consumer price index to account for inflation. Timber sale program expenditures are divided into the two broad groups of appropriated and off budget funds and then totaled. NFF deposits are displayed below the total timber sale program expenditure line. These deposits are subtracted to show the net financial impact to taxpayers.

As shown by Table 1 during the fiscal years 2013 to 2017 the timber sale program on national forests was a net cost to taxpayers in the range of $1.34 to $1.51 billion per year, which translates into a subsidy of between $500 and $600 per every thousand board foot (mbf) logged. The average annual taxpayer loss over the five-year period was $1.41 billion. Previous analyses by Hanson (1999) and Voss (2005) found the average annual losses during the FY 1997 to FY 2004 period to average a bit more - $1.71 billion per year in 2018 dollars. Thus, the timber sale program on national forests is a chronic money loser for taxpayers and continues to be subsidized at roughly the same levels it was since the late 1990s – over $1.4 billion per year. And as noted extensively in the prior Hanson (1999) and Voss (2005) reports these estimates are conservative because they do not include many other expenditures attributable to the logging program, such as the cost of fire suppression and the costs of externalized damages associated with logging such as loss of recreational opportunities, soil erosion, degradation of water quality, loss of game and non-game wildlife and fish species, and a reduction in scenic values.

SUPPLEMENTAL ANALYSIS: BLM AND FIRE SUPPRESSION COSTS

This section provides two supplemental figures expanding on the JMP-based analysis presented in Table 1 – net taxpayer losses from the Bureau of Land Management (BLM) timber sale program and the share of federal firefighting expenditures attributable to the logging program on both national forests and BLM lands. These figures provide

Table 1: Net taxpayer losses from the national forest logging program FY 2013 to FY 2017

Appropriated funds

	2013	2014	2015	2016	2017
Timber sales/ forest products management	$291,802,535	$305,954,877	$305,592,147	$320,183,363	$312,908,622
Vegetation and watershed management	$185,587,235	$195,929,139	$195,696,851	$193,258,866	$188,868,073
Reforestation trust fund	$31,396,325	$31,821,143	$33,902,311	$31,387,460	$32,781,593
Hazardous fuels reduction	$126,866,002	$137,337,660	$110,733,380	$134,740,552	$127,409,850
Forest health management - federal lands	$26,998,370	$33,186,413	$34,412,260	$34,028,152	$38,060,456
Forest roads program	$51,275,097	$53,761,925	$53,698,186	$56,262,133	$54,983,826
Road maintenance	$134,799,344	$129,904,714	$136,762,134	$131,227,742	$130,145,574
LRMP, inventory and monitoring	$122,576,624	$120,619,942	$120,476,939	$118,976,041	$116,494,299
Landownership management	$52,115,048	$47,720,915	$50,944,524	$46,175,107	$46,200,489
Timber research	$97,056,218	$99,050,731	$98,933,300	$93,377,692	$90,844,964
Support from other budget line items	$40,560,552	$42,527,728	$42,477,308	$44,505,487	$43,494,298
Total appropriated for logging	**$1,161,033,350**	**$1,197,815,187**	**$1,183,629,340**	**$1,204,122,595**	**$1,182,192,045**

Off budget expenditures for logging

Purchaser credit roads	$614,409	$1,431,951	$150,442	$1,046,249	$544,994
Timber pipeline restoration fund	$3,318,620	$5,990,330	$3,582,786	$3,923,432	$10,756,460
Salvage sales fund	$25,046,349	$21,683,987	$31,387,183	$31,387,460	$46,099,115
Brush disposal fund	$7,102,358	$9,018,112	$9,667,456	$9,416,238	$20,488,495
Cooperative work trust funds	$297,367,722	$182,519,709	$316,669,831	$119,167,721	$121,906,548
Total off budget expenditures for logging	**$333,449,458**	**$220,644,090**	**$361,457,697**	**$164,941,100**	**$199,795,612**

Net taxpayer losses

Total expenditures for logging	$1,494,482,808	$1,418,459,277	$1,545,087,038	$1,369,063,694	$1,381,987,657
Timber sales receipts deposited in NFF	$34,475,793	$31,863,570	$31,708,209	$31,342,123	$34,035,957
Total net taxpayer losses	**$1,460,007,015**	**$1,386,595,707**	**$1,513,378,829**	**$1,337,721,571**	**$1,347,951,701**

Table 2: Net taxpayer losses - supplemental

Net taxpayer losses - Forest Service, BLM, and fire suppression related to the timber sale program

	2013	2014	2015	2016	2017
Net taxpayer losses - Forest Service (Table 1)	$1,460,007,015	$1,386,595,707	$1,513,378,829	$1,337,721,571	$1,347,951,701
Net taxpayer losses reported by BLM	$68,506,429	$61,264,247	$55,696,240	$48,902,517	$51,010,058
Fire suppression costs related to timber	$273,408,284	$241,183,086	$252,759,685	$259,625,345	$412,593,398
Total net taxpayer losses (supplemental):	**$1,801,921,727**	**$1,689,043,039**	**$1,821,834,754**	**$1,646,249,432**	**$1,811,555,157**

a more expansive estimate of federal logging subsidies; however, the methods have not been peer reviewed or made consistent with the CRS-reviewed JMP methodology, so they should be considered experimental and supplemental to those presented in Table 1.

"The Forest Service is not the only federal agency that manages a logging program. The BLM also supplies timber to private industry, primarily from lands in western Oregon that were formerly granted to the Oregon and California Railroad company but reclaimed by the federal government in 1937. During the FY 2013 to FY 2017 period, the volume of wood extracted from these lands ranged between 200 and 260 million board feet per year."

Taxpayer losses from BLM's logging program

The Forest Service is not the only federal agency that manages a logging program. The BLM also supplies timber to private industry, primarily from lands in western Oregon that were formerly granted to the Oregon and California Railroad company but reclaimed by the federal government in 1937. During the FY 2013 to FY 2017 period, the volume of wood extracted from these lands ranged between 200 and 260 million board feet per year. As with national forest logging projects, the logging program on BLM lands is routinely challenged for its environmental harms, mainly because remnant old growth forests continue to be logged.[21]

The BLM maintains its books in a different manner than the Forest Service, and so it would take quite a bit of cross walking between various expense and revenue categories to make the estimates comparable. Nonetheless, the BLM does maintain its books in a way that facilitates a fairly easy, first pass assessment of net taxpayer costs.

During the FY 2013 to FY 2017 period, the BLM allocated funding for its timber sale program through four separate accounts under the broad category of Western Oregon Resources Management. According to BLM Budget Justifications, "[a]ll of the budget activities provide direct or indirect support for the development or implementation of sustained yield timber production" so it is reasonable to assign all the costs in these accounts to the timber sale program. Timber receipts are tracked closely, but the amount deposited in the US Treasury is not reported.

"In each year of the analysis, BLM reports net taxpayer losses in the range of $50 million to $70 million per year in 2018 dollars, which translates into a subsidy of $200 to $300 per thousand board feet logged."

Table 2 reports the net effect for each fiscal year. In each year of the analysis, BLM reports net taxpayer losses in the range of $50 million to $70 million per year in 2018 dollars, which translates into a subsidy of $200 to $300 per thousand board feet logged. These estimates are conservative, however, because they assume that timber sale receipts are not recycled back into planning for additional timber sales and that the four core accounts through which BLM tracks timber sale program expenses are comprehensive. Neither of these assumptions is likely to be true; however, without a detailed analysis such as we completed for the Forest Service we cannot refine these reported losses any further at this time. Nevertheless, it is clear that the BLM, like the Forest Service, provides a hefty subsidy for a logging program that is regularly challenged for its deleterious effects on climate, biodiversity, water, climate and other public trust resources.

Fire suppression expenditures attributable to the federal logging program

As noted above, the estimates in Table 1 do not include many other expenditures made necessary by the national forest logging program. One of the key expenses involves fire suppression. Each year, the Forest Service and various Department of Interior agencies suppress fires on millions of

acres of forests and rangelands. Since 2000, suppression activities have been implemented on a low of 3.4 million acres in 2010 to a high of 10.1 million acres in 2015. Since 2000, fire suppression expenditures on these federal lands has ranged between one and three billion per year.[22]

On forested lands, much of this expense can be attributable to logging activities for three primary reasons. First, many fire suppression activities are carried out to protect timber resources for future timber sales. In past justifications for its firefighting budget, the Forest Service conceded this point.[23] Secondly, many suppression activities are implemented because of past logging practices that have left national forestlands more susceptible to fire. For many fire adapted forest ecosystems in the western United States, logging has created hotter, drier, and more homogenous forest conditions that – whether justified ecologically or not – prompt federal forestland managers to suppress fires rather than let them burn.[24] Third, the vast majority of ignitions are human caused and occur along roads, and many of those roads were built and are now maintained to accommodate logging projects.

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In order to estimate the share of federal wildland fire suppression expenditures attributable to the federal logging program we partnered with Geos Institute for a GIS analysis of wildfires and fire suppression activities and costs during the 2012 to 2017 period. The basic method was to estimate the acreage on which fire suppression activities were likely related to past and planned logging, and then apply a per-acre cost for firefighting in a given fiscal year.

In particular, from the total area of wildland fires delineated by federal agencies for suppression and other management responses in each year, we removed fires that occurred in three areas: (a) non-forested areas; (b) protected areas, such as designated wilderness, national parks and national monuments, and (c) the wildland-urban interface. The reason for removing these acres is because fire suppression activities here are unlikely to have been related to past or planned logging. The deduction for non-forest areas is self-explanatory. The deduction of protected acres is made because these lands have had little or no past logging activities, and future logging is prohibited by law. The deduction for acres in wildland-urban interface areas is made because suppression activities here have an overriding purpose of saving lives and structures, not protecting the timber resource.

To the residual suppression acres – unprotected forestlands outside the wildland urban interface (WUI) – we applied a per-acre cost figure (updated to $2018) for nationwide fire suppression activities on federal lands reported by federal agencies each year. The results are reported in Table 2. So, for example, in FY 2016, federal agencies reported 67,595 individual fires necessitating fire suppression activities on 5.5 million acres of land at a cost of $1.98 billion. Of these acres, about 12.28% were forested lands outside of protected areas or WUIs. Multiplying these acres (675,998) by the national per-acre firefighting cost of $380.75 implies that over $257 million can reasonably be attributable to past and planned

logging activities. While his method is no substitute for a fire-by-fire analysis, a comprehensive analysis of federal logging subsidies would be remiss not to include this line item.

As reported in Table 2, adding BLM losses and these timber sale program related fire suppression costs to the tally pushes our estimate of taxpayer losses from the federal logging program up into the range of $1.7 billion to $1.8 billion each year during the FY 2013 to FY 2017 period.

CONCLUDING THOUGHTS

"Selling timber and other natural resources below cost is one of the classic forms of environmentally harmful subsidies (EHS) opposed by international institutions such as the OECD, IMF, European Union and others."

"Eliminating subsidized logging activities on federal public lands would not only free up taxpayer dollars for use on more socially productive programs but would also reduce environmental costs and make markets and trade more efficient."

Each year, the Forest Service authorizes enough logging on national forest lands to fill over 650,000 log trucks. Most of these commercial logging projects are contested on ecological grounds for their harmful impacts to wildlife, fish, water and increasingly challenged because they represent significant sources of carbon emissions and reduce the ability of the land to adapt to climate change by increasing fire risk, water shortages, and susceptibility to insects and disease. US taxpayers heavily subsidize these projects. As demonstrated in this analysis and previous analyses by Hanson (1999) and Voss (2005), the Forest Service sells this timber far below cost – losses that range between $1.4 and $1.8 billion per year.

Selling timber and other natural resources below cost is one of the classic forms of environmentally harmful subsidies (EHS) opposed by international institutions such as the OECD, IMF, European Union and others.[25] As an OECD member, the US has stated its support for eliminating these subsidies as well. Environmental harmful subsidies distort markets by causing overproduction of a resource – in this case timber – that is connected to one or more adverse impacts and by generating negative externalities that are passed on to the public rather than being absorbed as a cost of doing business.[26] They also distort free trade by creating unfair competition with countries that don't subsidize their timber. As such, eliminating subsidized logging activities on federal public lands would not only free up taxpayer dollars for use on more socially productive programs but would also reduce environmental costs and make markets and trade more efficient.

Congress has at least two options for doing so. The first option is to continue to offer timber for sale from national forests and BLM lands but require that all projects with a significant commercial timber component pay for themselves by ensuring that minimum bid prices reflect all direct and indirect costs to agencies. The second option is to recognize the unique role federal forests play in the forested landscape of the US and do away with the commercial timber sale program on these lands entirely. However, funding for restoration activities that have been linked with commercial logging should continue. Decoupling funding for these restoration activities from commercial logging will greatly bolster their integrity by allowing project managers to focus cleanly on ecological goals.

Offering below cost timber from federal public lands is just one form of environmentally harmful subsidy supporting the US timber industry. There

are many other types of federal subsidies to consider, as well as those implemented by state governments. In the next report in this series, we will consider state-level subsidies by examining a wide range of tax breaks and expenditures made by the State of Oregon but mimicked in many other states where industrial forest practices prevail.

ENDNOTES

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