



# Shared Responsibility

*The Conservation Community's  
Recommendations  
to Equitably Resolve the  
O&C County Funding Controversy*

Coast Range Association  
Cascadia Wildlands  
Geos Institute  
Klamath-Siskiyou Wildlands Center  
Oregon Wild  
Sierra Club  
The Larch Company

January 2012

## **Shared Responsibility**

*The Conservation Community's Recommendations  
to Equitably Resolve the O&C County Funding Controversy*

Coast Range Association  
Cascadia Wildlands  
Geos Institute  
Klamath-Siskiyou Wildlands Center  
Oregon Wild  
Sierra Club  
The Larch Company

January 2012

Written by  
**Randi Spivak**  
*Geos Institute*

with assistance from

**Andy Kerr**  
*The Larch Company*

**Doug Heiken**  
**Chandra LeGue**  
*Oregon Wild*

**Ivan Maluski**  
**Ani Kame'enu**  
*Sierra Club*

**Francis Eatherington**  
*Cascadia Wildlands*

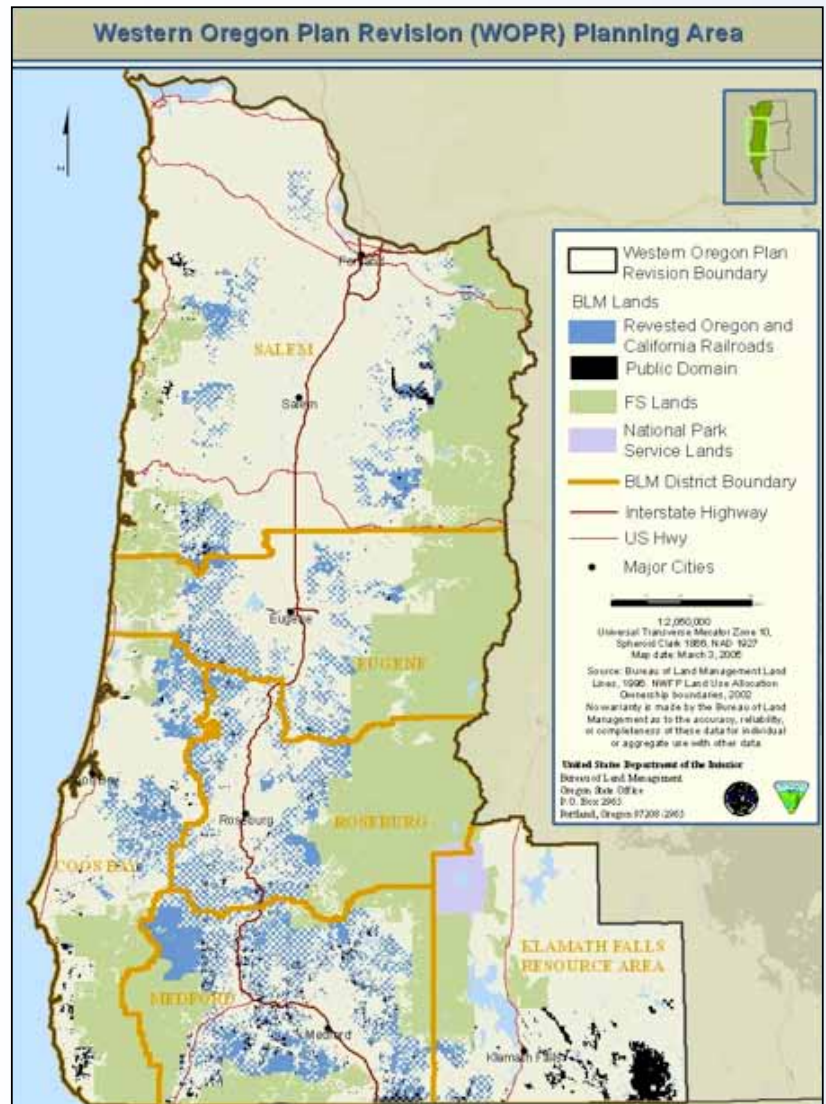
## Executive Summary

To equitably resolve the political crisis surrounding the financial problems of counties in Western Oregon and the long-term protection and restoration needs of western Oregon Bureau of Land Management (BLM) holdings, it will take concerted action by the U.S. Congress, the Oregon Legislative Assembly, the Governor of Oregon, and the affected counties.

Three interrelated central issues need to be addressed in order to reach a long-term solution regarding the 2.6 million acres of federal public forestlands in Western Oregon, most of which are commonly known as the “O&C” lands: (1) stable county funding; (2) diversifying local economies to create jobs; and (3) increasing conservation protections for ecosystem services. Increased logging will *not* solve these issues— but rather multi-faceted solutions at the federal, state and county levels of government are needed.

Historically, the affected counties have relied on support from national taxpayers for significant portions of their local operating expenses (the O&C Fund). This has led to unsustainable logging levels on federal forestlands that posed grave threats to clean water and watersheds, wild salmon and wildlife and still did not result in sustainable funding for counties. With uncertainty about continued high levels of direct federal payments to western Oregon counties, it is time for a new approach. This approach should be based on shared responsibility where the State of Oregon, the affected counties and the federal government equally share in resolving the financial impasse regarding county payments.

The 18 O&C counties have indicated that they seek \$110 million annually in perpetuity to fill in gaps in current county budgets.<sup>1</sup> While this number requires verification, using that figure, under a shared responsibility approach, each of the three levels of government should assume responsibility to meet one third of that goal, or ~\$36.7 million each. In order to reach this shared goal, there are numerous reasonable and just steps that all levels of government can take. Below are the preferred recommendations of the conservation community.



## Shared Responsibility

- The federal government can meet its share by reallocating the perpetual administrative savings achieved by transferring 2.6 million acres of federal public lands now managed by the Bureau of Land Management to the Forest Service and the Fish and Wildlife Service.
- The State of Oregon can meet its share by adopting a modest increase in the Oregon Forest Products

Harvest Tax on private timberland owners, which have been and are benefitting from increased timberland values and log prices due to the changing role of federal lands and the booming export market to China.

- The affected counties can meet its share by modest increases in property taxes by utilizing a portion of presently unutilized existing taxing authority.

## Three Western Oregon BLM Lands Matters that Governments Need to Solve

### #1 Stable County Funding

### #2 Diversifying the Economy to Create Jobs

### #3 Conservation Protections and Restoration for Critical Ecosystem Services

#### Central Issue #1: Stable County Funding

Historically, the 18 western Oregon counties have enjoyed tremendous fiscal benefits from federal timber receipts, primarily from cutting old growth forests on western Oregon BLM lands—far in excess of what they would have received had the so-called “O&C” lands (granted by Congress to the Oregon and California Railroad in 1866 and taken back in 1916 for violating the terms of the land grant) stayed in private ownership.

The unsustainable clearcutting of old-growth forests and the receipts they generated plummeted in the early 1990’s when the threat to salmon, wildlife, clean water and watersheds could no longer be ignored. Congress cushioned the fall by instituting direct federal payments (funded by national taxpayers) to help transition the counties away from dependence on federal subsidies. These payments expired this year.

Unlike most counties across the country, Western Oregon counties have disproportionately depended on federal generosity from timber receipts or direct treasury payments. Up to this point, national taxpayers have borne the costs of disproportionate share of the contribution from federal forests to western Oregon counties budgets.

A more responsible and enduring approach is to share the financial responsibility among the federal government, the State of Oregon, and the 18 O&C counties so that each level of government pays its fair share. Specifically, if the counties seek \$110 million annually, then each level of government should pay one third, or \$36.7 million each.

#### Is \$110 Million Per Year the Right Number to Solve For?

In 1937, Congress established the O&C Fund to compensate counties for payments in lieu of taxes. Since the O&C lands were previously private timberlands owned by the railroad and on the counties’ tax roles, the idea was to compensate the counties for the revenues they lost by returning the lands to federal ownership, as the Constitution prohibits local governments from taxing federally owned lands.

Historically, the 18 O&C Counties have received 50% of gross receipts from the sale of timber from the O&C lands. In comparison, counties receive 25% from National Forest System lands. The 1937 O&C Lands Act provides for 75% of gross timber revenues to be given to the counties, but from the 1950s until relatively recently, the counties received 50%, returning one-third of the revenue from logging receipts back to BLM to pay for management.

The 18 O&C Counties have requested \$110 million annually, which is more than the average of the three highest years ever of O&C timber receipts. It was from a time when Oregon was clearcutting two square miles weekly of old-growth forest, watersheds and clean water sources were being polluted and Oregon’s historically bountiful wild salmon runs were in jeopardy of going extinct.

The average annual timber receipts from 1960 to 1993 (the year before the court injunctions to protect the northern spotted owl began to lower logging levels) was \$56.3 million/year.<sup>2</sup>

***If western Oregon BLM lands were still privately owned timberlands rather than publicly owned forestlands, the estimated annual tax revenues—the true payment in lieu of taxes—would be \$8 million annually.<sup>3</sup>***

## A. Federal Share (\$36.7 Million Annually)

The only significant amount of forested holdings on BLM lands are in Western Oregon, which comprise just 1% of the 253 million acres administered by the BLM. In Western Oregon, the BLM spends 4.3 times more to manage an acre of land than does the Forest Service while producing a comparable amount of timber.<sup>4</sup> Transferring the 2.6 million acres of federal public forests lands now managed by the BLM to the Forest Service could result in savings on the order of \$113.1 million annually.<sup>5</sup>

Merging existing BLM districts with adjacent National Forest districts and eliminating the Oregon State Office of the BLM and associated overhead would gain efficiencies.

---

*“In Western Oregon, the BLM spends 4.3 times more to manage an acre of land than does the Forest Service.”*

---

A small portion of these lands may be appropriate to be transferred to the U.S. Fish and Wildlife Service to be managed as part of the National Wildlife Refuge System.

A portion of these annual savings could be used to fund the federal government’s share. There would still be a considerable amount of money that could then be allocated to create jobs by increasing ecologically appropriate thinning across the full Northwest Forest Plan area as well as increasing watershed restoration in western Oregon. Alternatively, a portion of these annual savings could be returned to the treasury.

## Congressional Accounting Challenges

Each year Congress funds the BLM in Western Oregon to manage 2.6 million acres of federal public lands. If Congress were to transfer these lands to the U.S. Forest Service and Fish and Wildlife Service, \$113.1 million annually could be saved each year. Besides using this money to pay the federal government’s fair share to replace the O&C Fund, in addition, over 2,000 new jobs could be created in forest (commercially profitable ecological restoration thinning) and watershed restoration (removing unneeded roads and stormproofing the rest).

However, the House of Representatives has an internal accounting “rule” that essentially says that money saved in such a fashion cannot be dedicated to another purpose.

Oregon’s Rep. Greg Walden played a major leadership role in writing the House rules. He is arguably the 12th most powerful member of the House of Representatives and has the ear of Speaker Boehner. Fortunately, the House of Representatives that adopted the rule can choose to make an exception. All that is necessary is for Rep. Walden to convince his colleagues of the worthiness of an exception in this case.

Notably, the United States Senate does not have such a rule.



Natural Forest Stand on Coos Bay BLM District Proposed for Logging

Photo by Francis Eatherington

## B. State Share (\$36.7 Million Annually)

The State of Oregon could impose a modest increase in the Oregon Forest Products Harvest Tax to raise \$36.7 million annually.

The Forest Products Harvest Tax (FPHT) is the one Oregon forest tax that is paid by nearly every timber harvester throughout the state.

The existing FPHT funds programs that exclusively benefit the timber industry. Private timberland owners, who pay 81% of the FPHT, pay extremely low taxes compared to other businesses, and arguably do not pay their fair share of taxes to appropriately contribute to the general welfare of Oregon and the affected counties.

The average FPHT rate between 2004-2010 was \$3.21/ thousand board feet (MBF). The average amount of timber cut between 2001-2010 was 3,777 million board feet. To raise \$36.7 million annually so the state could pay its fair share of the O&C fund the FPHT would have to increase \$9.21/ MBF, assuming average timber prices.

Unlike property and income taxes that are levied as a percentage of value or income the FPHT is a set dollar amount levied for each 1,000 board feet of logs (after exempting the first 25 MBF annually). For example, if the price of logs doubles, the tax remains the same, effectively halving the tax.

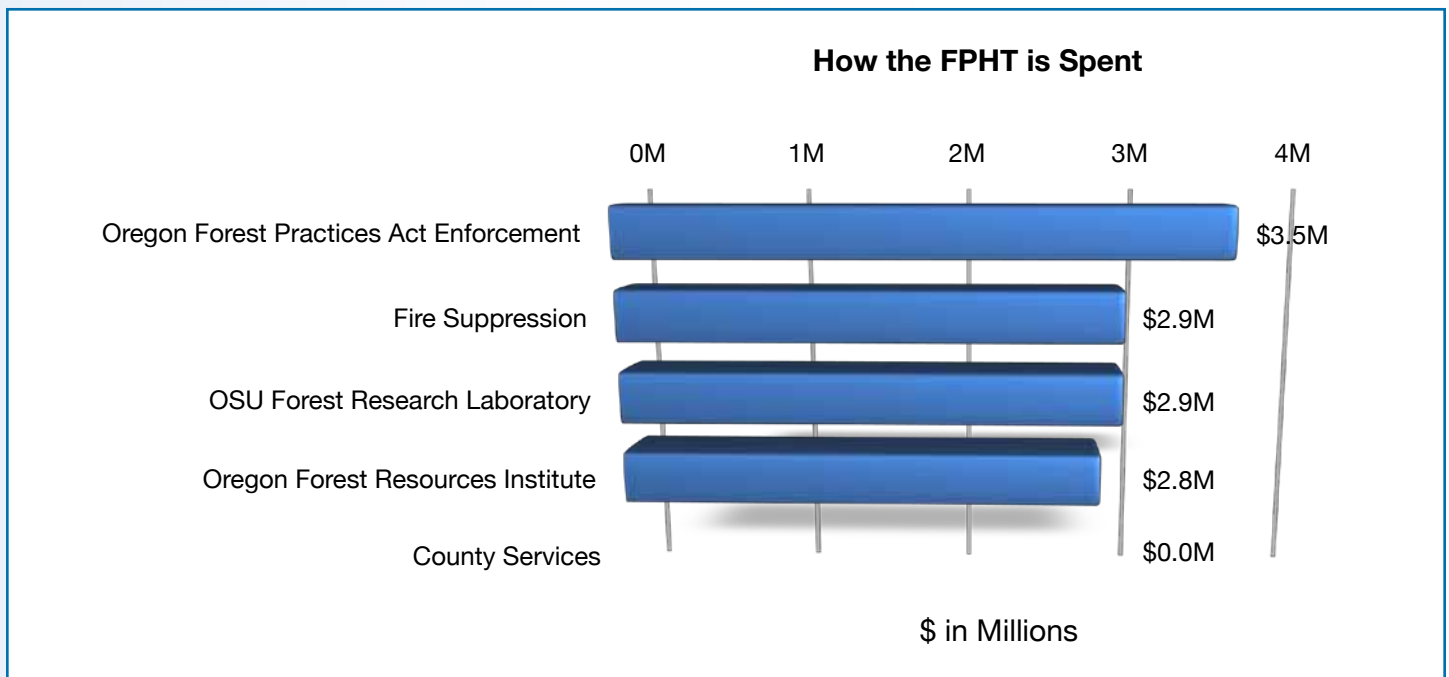
Due to booming export markets, in November 2011, Douglas-fir #2

sawlogs in southern Oregon were selling for \$545/MBF. If an additional tax of \$9.21/MBF was levied, the effective tax rate would be 2.27% of the log value.<sup>6</sup>

Timber values have risen significantly in recent times. Oregon private timberland owners have seen higher land and log values due to policy safeguards on the amount of logging



Industrial Forest Practices Under the Oregon Forest Practices Act



**B. State Share (\$36.7 Million Annually) cont.**

on federal public forestlands and the prohibition against exporting federal logs overseas. It is fitting and proper that a portion of the timber industry’s fiscal windfalls contribute to the welfare of the counties.

Log prices are high and this would be a very small percentage increase to private timberland owners who are a receiving a dual windfall profit from reduced federal logging and increased log prices due to Chinese demand. The premium on logs going to China (which is making domestic mills pay higher prices) is on the order of \$100-\$150/MBF, so this fair-share contribution would effectively be a timber tax of ~10% or less of the windfall for the state to provide its share.

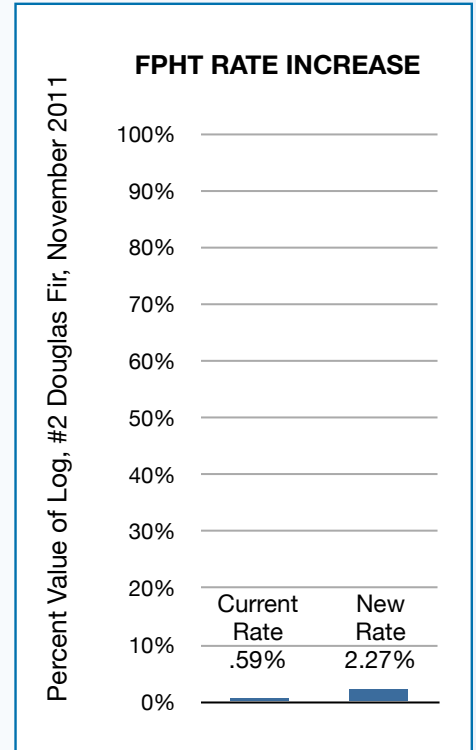
As the Forest Products Harvest Tax is not a property tax, it is not necessary to modify Measures 5 and 50, so the Oregon Legislative Assembly could pass this modest tax increase.

It should be noted that private

timberland owners are the beneficiaries of extraordinarily favorable local property tax treatment, which results in these owners paying far less than their fair share, particularly when compared to other classes of property owner classes. As the 2009 Governor’s Task Force on Federal Forest Payments and County Services said:

*“Oregon counties are saddled by a property tax system that has tied local tax rates to rates in effect more than a decade ago and fails to capture the full value of economic activity and growth. As a consequence, counties cannot grow their way out of these problems in the way that the state rode the wave of economic recovery to a fiscal comeback between 2003 and 2007.”*

If there is not the political will for such a modification, then perhaps the affected counties can provide for both their own and the state’s share by raising local property taxes. As



noted below, the affected counties have underutilized existing taxing authority—no modification to Measures 5 and 50 are necessary—that could provide for all \$110 million requested by the affected counties.

**C. County Share (\$36.7 Million Annually)**

Curry County has told Governor Kitzhaber that it will soon be insolvent if Congress does not again extend direct payments as an alternative to sharing timber receipts from federal public forestlands.

According to the Tax Foundation, Curry County taxpayers pay the lowest property taxes in the state.

Curry and Multnomah counties pay \$4.30 and \$9.80 respectively per \$1,000 of real market value of a median home. The median for Oregon as a whole is \$8.90/\$1,000 and for the United States is \$9.70/\$1,000.

The median home value for Curry and Multnomah counties is \$267,400 and

\$269,000 respectively and for Oregon as a whole is \$257,400. All are well above the median for the United States at \$185,400.

The owner of a median home in Curry and Multnomah counties pays 2.64% and 3.85% respectively of median income in annual property taxes. Oregon as a whole pays 3.59% and the nation pays 2.81%.

While the median home value in Curry and Multnomah counties are nearly identical, the median annual tax bills are \$1,157 and \$2,654 respectively.

There is generally a correlation between the hard hit and/or “in crisis” counties having very low property

tax rates relative to other counties in Oregon. Curry County has been free-riding at the expense of the nation’s taxpayers and the nation’s federal public forestlands.

If Curry and the other O&C Counties were to pay their fair share to replace the O&C Fund, proportionally the taxes on a median home in Curry County would have to rise \$1.33/week—less than a cup of coffee.

In 1927, Justice Oliver Wendell Holmes noted, “taxes are what we pay for civilized society.”

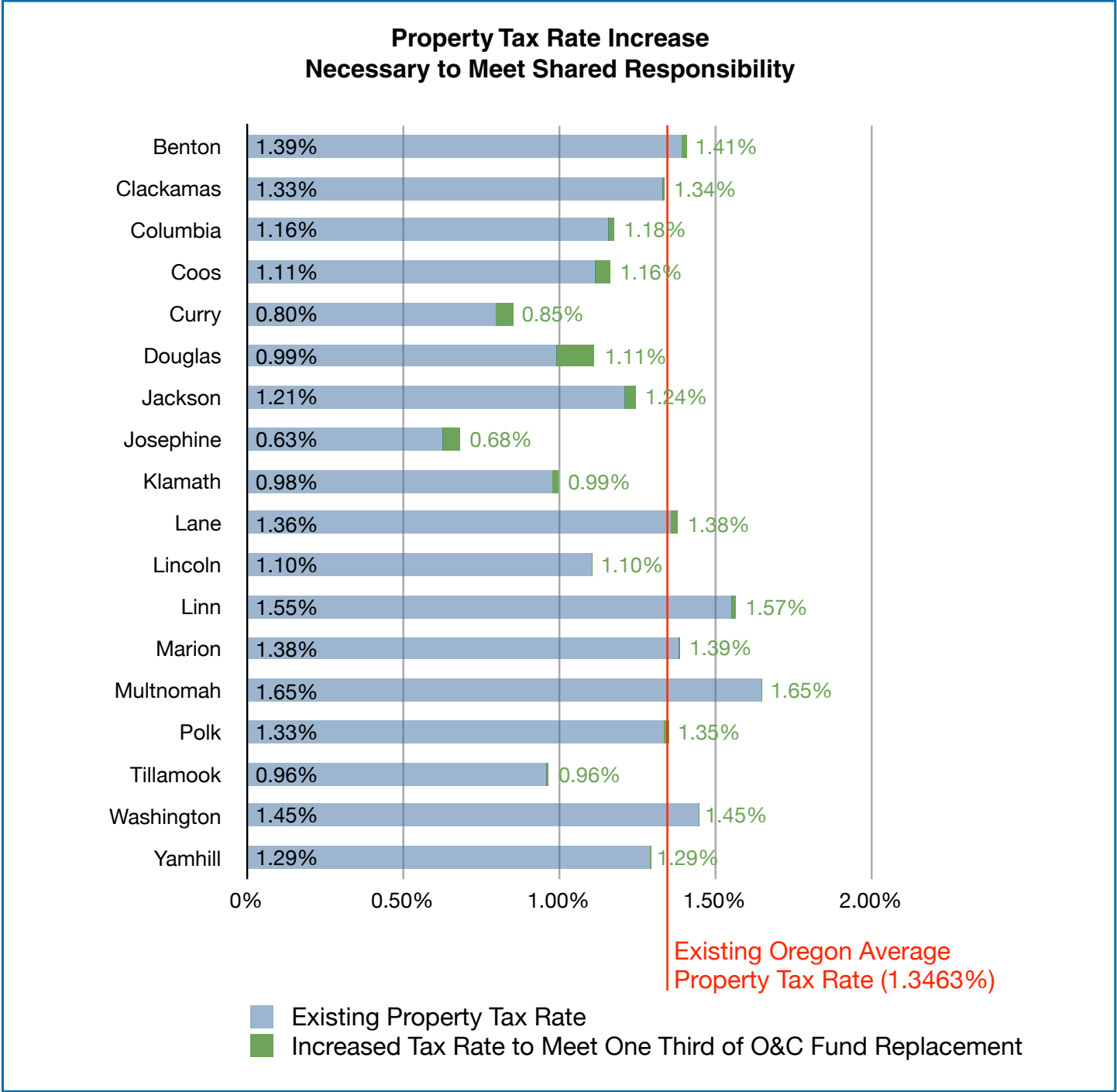
Curry County needs to adjust their taxes to be more in line with the rest of the state.

**C. County Share (\$36.7 Million Annually) cont.**

All of the affected counties—including those “hard hit”—currently have the authority and ability to levy additional taxes to make up for shortfalls. For example, to pay its obligations, Multnomah County also taxes gasoline sales and has had its own general income tax.

Importantly, the O&C counties currently have unutilized property tax capacity that is far in excess of the entire amount of money that the O&C Counties are requesting of the federal government. These counties should deploy a portion of their unutilized tax capacity to contribute their fair share

of operating revenues. If the 18 O&C counties increased their current average property tax rates by an average of 0.02%, they could contribute their share of \$36.7 million annually.<sup>8</sup>





## Central Issue #2: Diversifying the Economy to Create Jobs

Historically, Oregon's dependence on wood products has had significant adverse repercussions, not only on water quality and wildlife habitat, but also on the economy. This was especially true during recessions when employment and income would swing wildly based on interest rates and business cycles. For the last 20 years, the

timber industry has shrunk while the rest of Oregon's economy has grown.<sup>9</sup> Consequently, the timber industry represents a decreasing fraction of Oregon's economy and employment.

Economic development strategies should emphasize industries that are diverse and growing rather than declining industries like timber and wood products. Further, while logging may provide short-term revenues, logging also incurs significant costs that are ultimately borne by taxpayers in Oregon and nationwide. Increasingly, entrepreneurs are basing their business location decisions on the quality of life in an area, and Western Oregon has a unique combination of wide-open spaces, scenic vistas and recreational opportunities.

In addition to economic diversification, there are job creation opportunities from public forests. While domestic demand for timber remains low, the need for watershed and forest restoration remains very high, due to decades of damaging

---

*“Economic development strategies should emphasize industries that are diverse and growing rather than declining industries like timber and wood products.”*

---



Coos Bay Logs Ready for Export

Photo by Richard Chasrn

### Log Exports

Exports of raw (unprocessed) logs from private timberlands in Oregon and Washington are on the rise again due to increased demand from East Asia. In 2010, the United States exported unprocessed logs valued at \$1.9 billion, second behind Russia. \$698 million (37%) of the logs value came from Oregon and Washington.

When raw logs are exported so are domestic wood manufacturing jobs. According to Richard Haynes,

a consulting natural resource economist formerly with the U.S. Forest Service, as a rule of thumb, there are about five milling jobs for every million board feet of logs manufactured domestically, while there is only one job exporting those same logs.<sup>11</sup>

If Congress feels it would be valuable to significantly increase log supplies to Oregon mills, they should address the export of raw logs from non-federal lands.

## Central Issue #2: Diversifying the Economy to Create Jobs (cont.)

logging and roadbuilding. The need for ecological and hydrological restoration creates opportunities for skilled job creation.

University of Oregon economists estimate that for every \$1 million spent on forest watershed restoration 16.3 direct and indirect jobs are created in Western Oregon.<sup>10</sup> Rather than focus on controversial and damaging commodity logging, federal agencies should fund only necessary ecological forest and watershed restoration, including, where appropriate, thinning that will produce timber as a byproduct.

In addition to jobs, the benefits of watershed restoration are clear: cleaner water, improved fish habitat, restored flood control capacity, stormproofed roads, a more sustainable road system, access for users and increased forest resiliency for adapting to climate change.

For example, logging roads trigger a significant percent of storm and flood-caused debris torrents, dumping debris or entire hillsides into streams.<sup>12</sup> There is increasing recognition that protecting forested water sources is often more cost effective than filtration technology.<sup>13</sup> For fisheries, fine sediments can suffocate fish eggs, severely reducing the numbers of fish.<sup>14</sup> It can take years for such sediments to wash through the system. Decimated fisheries result in significant costs to commercial and recreational fishing industries.

In addition, there are millions of acres of previously logged federal public lands where judicious thinning of dense plantations and dry fire-prone forests can aid

ecological recovery, creating jobs and producing logs without the adverse effect of clearcutting.

Our analysis shows that ~730 million board feet (MMBF) per year of commercial timber could be obtained during a 20-year restoration period from ecological restoration thinning projects on degraded forestlands within the Northwest Forest Plan (NWFP) area—a 22% increase of commercial timber compared to the average of 526 MMBF sold from 1995 to 2008. Using the Oregon Department of Forestry metric of 11.4 jobs for every million board feet of logs produced,<sup>15</sup> such ecological restoration thinning for the next two decades could create or maintain 8,322 jobs.

National Forests like the Siuslaw have been promoting this approach for years. There has been no litigation or appeals in over 10 years and ecologically appropriate thinning is producing timber byproducts.

### Acknowledge Depressed Demand and Resultant Excess Mill Capacity

In western Oregon domestic milling capacity far outstrips domestic market demand, especially for mills that are designed to log large and old-growth trees. The over capacity has become even more apparent with the collapse of the American housing bubble. Housing and timber demand in the U.S. are at an all-time low.

U.S. housing starts in January 2012 were 657,000 (seasonally adjusted annual rates) compared to the bubble-induced record in 2005 of 2,068,000.<sup>16</sup> With just less than one-third of the recent record demand, mills are struggling. Market forces are continuing to rationalize milling capacity with market demand. The portion of the western Oregon timber industry, whose business models greatly rely on federal timber, seeks to influence market supplies—yet they cannot do anything about the market demand for wood products. That is an exercise in futility.

Under any circumstances, it is highly doubtful that the United States will see the irrational exuberance of the recent housing bubble again anytime soon.

The result is that without a significant increase in demand, some mills will close over the next several years. This fact must be acknowledged when crafting a long-term solution for O&C counties and federal lands management.

## Central Issue #3: Conservation Protections and Restoration for Critical Ecosystem Services

Private forests do not serve public interests very well. As a result the public demanded changes to federal logging practices, so they and their children could enjoy clean water for fishing and drinking, protected old growth habitat for hunting and recovery of threatened species, and unspoiled landscapes that improve our quality of life. With increased scientific evidence, we can now add to that list the climate value of carbon stored in our public forests.

Concurrent with the shared county funding solution and with increasing

the amount of watershed and ecologically appropriate restoration thinning on federal forestlands in western Oregon, Congress should consider the following:

- **Transfer all Western Oregon BLM lands to the National Forest System or National Wildlife Refuge System.** This transfer will result in improved management and increased ecological and watershed restoration as well as cost savings.
- **Provide a statutory mandate for the conservation of old forests**

**in western Oregon.** Permanent protection is needed for these forests. Older forests in western Oregon are critically important for clean water, wild fish, wildlife habitat and carbon storage that helps regulate our climate and mitigate climate change impacts. What remains of the once vast older forest in the Pacific Northwest should be conserved, and more old growth created over time.

- **Restore young forests using ecological restoration thinning so they can become old growth forests again.** Doing so will fulfill the Northwest Forest Plan vision of a functional forest ecosystem with large reserves where natural processes dominate. We can also help mitigate climate change by letting these forests grow to store more carbon.
- **Provide statutory protections to conserve and restore watersheds.** One of the most important services that national forests provide is clean, fresh water for salmon, communities and businesses. In fact, half of the drinking water in the west comes from national forests.<sup>17</sup> The Northwest Forest Plan has greatly helped watersheds recover from significant damage from logging and associated roadbuilding. But more is needed. Oregon has the greatest number of federal logging roads than any other state.<sup>18</sup> Logging roads are the number one source of chronic sediment that bleeds into streams, which in turn smothers salmon eggs, increases costs to upgrade or install water filtration systems, and increases the need to dredge reservoirs.

### Clean Water for People and Fish, Critical Habitat for Imperiled Species, Scenic Views & Recreational Opportunities

Some argue that Western Oregon BLM lands are growing far more timber than anyone reasonably wants to log, so it is not a problem to significantly increase logging levels to help fund the counties and provide logs to local mills that cannot compete for private timber going to China. Why, that sounds as good as a fat-free hot fudge sundae, doesn't it? Unfortunately, no such thing exists.

Actually, decreased logging levels are allowing more trees to eventually grow into old growth and for watersheds to begin to recover from decades of clearcutting and road building. The growing forest needs to be conserved for salmon and other imperiled species, to allow watersheds to heal and to maintain and improve scenic views and recreation opportunities.



Photo by Francis Eatherington

Wild, Endangered Coho Salmon, N. Umpqua River

## **For More Information**

Randi Spivak, Vice President for Government Affairs, Geos Institute, Washington, DC. 310.779.4894;  
randispivak@geosinstitute.org

Andy Kerr, Director The Larch Company, Washington DC and Ashland, OR. 503.701.6298; andykerr@andykerr.net

Chuck Willer, Director, Coast Range Association, Corvallis, OR. 541.231.6651; chuckw@coastrange.org

Josh Laughlin, Campaign Director, Cascadia Wildlands, 541.434.1463, jlaughlin@cascwild.org

Steve Pedery, Conservation Director, Oregon Wild, 503.998.8411, sp@oregonwild.org.

Ivan Maluski, Conservation Director, Oregon Chapter Sierra Club. 503.449.2270, ivan.maluski@sierraclub.org

Joseph Vaile, Campaign Director, Klamath-Siskiyou Wildlands Center, 541.621.7808, joseph@kswild.org.

- 1 Association of O&C Counties. undated. Enclosure 1 to Memorandum entitled "Proposed O&C Lands Conservation and Management Trust" entitled "O&C Lands Conservation and Management Trust: Outline of Key Elements" (available at [www.andykerr.net/AOCC-land-grab](http://www.andykerr.net/AOCC-land-grab)).
- 2 Kerr, Andy. 24 January 2012. Federal Payments to the O&C Counties, 1960-2010 .The Larch Company, Ashland, OR and Washington, DC. Available at [www.andykerr.net/downloads](http://www.andykerr.net/downloads).
- 3 Kerr, Andy. 24 January. 2012. County Revenues If Western Oregon BLM Lands Were Still in Private Ownership. Memorandum to Interested Parties. The Larch Company, Ashland OR and Washington DC. Available at [www.andykerr.net/downloads](http://www.andykerr.net/downloads).
- 4 In FY 2011, BLM sold 217 million board feet while the Forest Service sold 209 million board feet during the same time period.
- 5 Kerr, Andy. 24 January 2012. Shared Responsibility for O&C Funding: Cost Savings of Transferring Western Oregon BLM Lands to the Forest Service to be part of the National Forest System. The Larch Company, Ashland, OR and Washington DC. Available at: [www.andykerr.net/downloads](http://www.andykerr.net/downloads).
- 6 Kerr, Andy. 24 January 2012. Shared Responsibility for O&C Funding: Increasing Oregon Timber Taxes. The Larch Company, Ashland, OR and Washington, DC. Available at [www.andykerr.net/downloads](http://www.andykerr.net/downloads).
- 7 \_\_\_\_\_. 2009. Governor's Task Force on Federal Forest Payments and County Services. State of Oregon, Salem, OR. Page 10.
- 8 Kerr, Andy. 24 January 2012. Shared Responsibility for O&C Funding: Increasing County Property Taxes The Larch Company, Ashland, OR and Washington, DC. Available at [www.andykerr.net/downloads](http://www.andykerr.net/downloads).
- 9 Data Sources: U.S. Department of Commerce 2011. Census Bureau, County Business Patterns, Washington, D.C.
- 10 Nielsen-Pincus, Max and Cassandra Moseley. 2010. Economic and Employment Impacts of Forest and Watershed Restoration in Oregon. Ecosystem Workforce Program Working Paper 24. Institute for a Sustainable Environment, University of Oregon, Eugene, OR.
- 11 "West Coast Log and Lumber Exports Jump in 2011, Fueled by China's Export Boom, by Eric Mortenson, The Oregonian (Portland), September 9, 2011.
- 12 Cover, M.R., JA de la Fuente, and V.H. Resh. 2010. Catastrophic disturbances in headwater streams: the long-term ecological effects of debris flows and debris floods in the Klamath Mountains, northern California. Canadian Journal of Aquatic Sciences 67: 1596-1610; Amaranthus, M.P., R.M. Rice, N.R. Barr, and R.R. Ziemer. 1985. Logging and forest roads related to increased debris slides in southwestern Oregon. Journal of Forestry 83(4): 229-233.
- 13 Barnes, M.C., A.H. Todd, R. Whitney Lilja, and P.K. Barten. 2009. Forests, Water and People: Drinking water supply and forest lands in the Northeast and Midwest United States. NA-FR-01-08. Northeastern Area State and Private Forestry, USDA Forest Service, Newtown Square, PA; Ernst, C., R. Gullick, and K. Nixon. 2004. Protecting the source: conserving forests to protect water. Opflow (a journal of the American Water Works Association): 30: 1-7; Furniss, M.J., B.S. Staab, S. Hazelhurst, C.F. Clifton, K.B. Roby, B.L. Ilhadrt, E.B. Larry, A.H. Todd, L.M. Reid, S.J. Hines, K.A. Bennett, C.H. Luce, P.J. Edwards. 2010. Water, climate change, and forests: watershed stewardship for a changing climate. Gen. Tech. Rep. PNW-GTR-812. Pacific Northwest Research Station, USDA Forest Service, Portland, OR.
- 14 Newcombe, C.P., and D.D. MacDonald. 1991. Effects of suspended sediments on aquatic ecosystems. North American Journal of Fisheries Management 11:72-82.
- 15 Lettman, Gary, Economist, Oregon Department of Forestry. Personal Communication, November 17, 2009.
- 16 National Association of Home Builders Housing Starts. 19 January 2012. <http://www.nahb.org/generic.aspx?genericContentID=45409> (accessed 30 January 2012).
- 17 Sedell, J, S Maitland, D Dravnieks, M Copenhagen, M Furniss. 2000. Water and The Forest Service. USDA Forest Service, FS-660, Washington, DC. 40 pp.
- 18 U.S. Forest Service Road Accomplishment Reports for FY11.