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THE EMPLOYMENT AND ECONOMIC IMPACTS OF FOREST AND WATERSHED RESTORATION IN OREGON

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With the current focus on developing the green economy as a strategy for economic recovery, there has been an increasing emphasis on investing in renewable energy development, energy efficiency, and businesses that have more sustainable supply chains and end products. Today's focus on a green economy builds on a much longer standing effort in the agricultural and natural resource sectors to foster organic agricultural products, certified wood, and ecological restoration of forests and watersheds. For more than fifteen years state and federal governments have invested in forest and watershed restoration in the Pacific Northwest. The purpose of this study was to examine the employment and economic impacts of public investments in forest and watershed restoration in Oregon.

Approach

Typically, restoration projects are planned and coordinated by one entity—a government agency (e.g., a local forest service office or a soil and water conservation district) or a nonprofit organization (e.g., a watershed council)—but implemented by contractors, who do various aspects of the work of restoration.¹ We investigated both in-house and contracted restoration activities by creating two different types of economic impact models: one describing contracted restoration activities and one describing whole restoration projects.

We used the economic impact-modeling software IMPLAN 3.0 to describe the employment and economic effects of public investments in forest and watershed restoration. To create custom impact models for forest and watershed restoration, we compiled fiscal data from a sample of ninety-nine Oregon Watershed Enhancement Board (OWEB) grants, conducted surveys with 190 businesses² that provide services for forest and watershed restoration projects, and surveyed fifteen watershed

council coordinators who manage restoration projects. All data were inflation-adjusted and reported in 2005 U.S. dollars.

Findings

We found that forest and watershed restoration contracting (Table 1) leads to between 15.7 and 23.8 jobs per \$1 million dollars of public investment and results in an additional 1.4 to 2.4 times the amount of economic activity as public dollars cycle through Oregon's economy (Table 2). Employment multipliers tend to be greatest for equipment-intensive contracting and least in the labor-intensive and technical contracting, where labor requirements are greater and the requirements for goods and services are relatively small.

We also investigated the impact of restoration grants to examine how different types of contracting combine with other project spending to create economic impacts for six types of projects (Table 3). On average, we found every million dollars of public investment in forest and water-



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Table 1. Types of contracted work

<i>Contracted work types</i>	<i>Definition</i>
<i>Equipment-intensive watershed work</i>	<i>Constructing stream habitat features, excavating of floodplain, and wetland features</i>
<i>Equipment-intensive forestry work</i>	<i>Forest thinning, small diameter and selective logging, mowing and masticating ground fuels</i>
<i>Labor-intensive work</i>	<i>Site preparation, planting trees and shrubs, cutting small trees and brush by hand</i>
<i>Technical planning and design work</i>	<i>Conducting field surveys, engineering, and writing planning documents</i>

shed restoration projects supports 16.7 jobs in Oregon, ranging from 14.7 to 23.1 jobs per \$1 million invested (Table 4). We also found that every dollar of public investment in forest and watershed restoration projects is multiplied in economic activity between 1.7 and 2.6 times as it cycles through Oregon's economy.

In Oregon, forest and watershed restoration makes up only a fraction of economic activity in natural resource sectors. Payroll for forestry, fishing, agriculture, and supporting activities in 2007 alone was nearly \$450 million.³ In conservative terms, the total investment in of restoration projects in Oregon between 1995 and 2007 was about \$500 million.⁴ Nonetheless, our analysis of the Oregon Plan for Salmon and Watersheds indicated OWEB investments alone supported nearly 2,700 jobs or about 230 jobs per year. If distributed evenly across the state, this equates to nearly seven jobs per county per year, or potentially one to two small businesses per county.

Our study suggests that forest and watershed restoration has a similar impact on employment as other public-infrastructure investments. Heintz et al. examine the national employment impacts of public investments in a

variety of infrastructure categories, including those they refer to as green infrastructure such as investments in solar and wind power, water projects, and mass transit. The authors define water projects from the perspective of drinking and wastewater treatment, and civil engineering around dams and other water management projects rather than through the lens of restoration. Heintz et al. estimate that, per \$1 million of public investment in infrastructure, total employment impacts range from 14.5 to 23.8 jobs, and that \$1 million of public investment in "green" infrastructure results in total employment impacts of 14.8 jobs for wind power, 15.8 jobs for solar power, 19.8 jobs for water projects, and 22.8 jobs for mass transit.⁵ Our estimate for forest and watershed restoration projects is similar—ranging from 14.7 to 23.1 jobs per \$1 million of public investment.

More Information

The complete study can be found in the EWP Working Paper #23, entitled "The Employment and Economic Impacts of Forest and Watershed Restoration in Oregon," which is available on the web at ewp.uoregon.edu.

Table 2. Employment and output effects per \$1 million invested in forest and watershed contracts

<i>Contracted work types</i>	<i>Jobs</i>	<i>Economic output</i>	<i>Output multipliers</i>
<i>Labor-intensive</i>	<i>23.8</i>	<i>\$2,153,402</i>	<i>1.5–2.2</i>
<i>Equipment-intensive (watershed)</i>	<i>15.7</i>	<i>\$2,380,186</i>	<i>1.8–2.4</i>
<i>Equipment-intensive (forestry)</i>	<i>17.2</i>	<i>\$2,377,995</i>	<i>1.8–2.4</i>
<i>Technical</i>	<i>19.1</i>	<i>\$2,113,056</i>	<i>1.4–2.1</i>

Table 3. Types of restoration projects

Project types	Definition
<i>In-stream</i>	<i>Enhancing stream habitat and function</i>
<i>Riparian</i>	<i>Enhancing and restoring native riparian vegetation</i>
<i>Wetland</i>	<i>Restoring wetland and estuarine habitat</i>
<i>Fish passage</i>	<i>Removing barriers to fish passage (culverts and dams), screening to protect fish from water withdrawals</i>
<i>Upland</i>	<i>Managing agricultural water, juniper, and noxious weeds</i>
<i>Other</i>	<i>Undertaking multiple activities in one comprehensive restoration project</i>

Table 4. Employment and output effects per \$1 million invested in forest and watershed projects

Project type	Jobs	Economic output	Output multipliers
<i>In-stream</i>	14.7	\$2,203,851	1.7–2.2
<i>Riparian</i>	23.1	\$2,310,128	1.7–2.4
<i>Wetland</i>	17.6	\$2,259,422	1.8–2.4
<i>Fish passage</i>	15.2	\$2,240,281	1.8–2.3
<i>Upland</i>	15.0	\$2,476,290	2.0–2.6
<i>Other</i>	14.7	\$2,270,862	1.8–2.3
<i>All (aggregate)</i>	16.3	\$2,311,468	1.9–2.4

Endnotes

- 1 For a discussion of when watershed councils decide to use contractors, see Fraser McDonald, Cassandra Moseley, Emily Jane Davis, Max Nielsen-Pincus, Autumn Ellison, Mobilizing Human Resources for Watershed Restoration, EWP working paper number 22, <http://ewp.uoregon.edu/publications>
- 2 For a profile of forest and watershed contractors, see Autumn Ellison, Cassandra Moseley, Max Nielsen-Pincus, Fraser McDonald, The business of restoration: A profile of forest and watershed management contractors in Oregon, EWP working paper number 23, <http://ewp.uoregon.edu/publications>.
- 3 US Bureau of the Census, *County Business Patterns*. Available online [URL]: <http://www.census.gov/> (accessed April 5, 2010).
- 4 Oregon Watershed Enhancement Board, *Oregon Plan biennial report 2007-2009* (Salem, Oregon: Oregon Watershed Enhancement Board, 2008).
- 5 J. Heintz, R. Pollen, and H. Garrett-Peltier, How infrastructure investments support the US economy: Employment, productivity, and growth (Amherst, MA: Political Economy Research Institute. University of Massachusetts Amherst 2009).

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