

Science

FINDINGS

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“Science affects the way we think together.”

Lewis Thomas

WHAT’S IT WORTH TO YOU? ESTIMATING THE PUBLIC’S WILLINGNESS TO PAY FOR BIODIVERSITY CONSERVATION



Citizens and forest managers discuss the challenges of public and private land policies.

“Public opinion sets bounds to every government, and is the real sovereign in every free one.”

—James Madison

The diversity of plants and animals found in Pacific Northwest forests are a treasure. The majestic stands of ancient Douglas-fir are invaluable. Clear, cascading streams dense with migrating salmon; priceless? No really, what are they worth? Or, more precisely, how much would you be willing to pay to increase protection of migrating salmon and other elements of biological diversity in the Pacific Northwest? How much would you have to be paid to decrease protection?

Conservation requires tradeoffs. Increasing the level of biodiversity protection may mean that a new housing development can't be built or a timber harvest is forgone. Economists can easily

calculate the value of a house or of a volume of timber. Figuring a dollar value for biodiversity is a much greater task.

“In a simple financial analysis, if something isn't bought or sold—if it doesn't have an explicit price—then its value is effectively assumed to be zero or some fixed amount,” explains Brian Garber-Yonts, a research economist at the PNW Station in Corvallis, Oregon. “Like other unpriced natural resources, biodiversity is valuable. But when it is compared to things like jobs or commodities, defining—let alone quantifying—that value is very difficult.”

Garber-Yonts is a practitioner of “nonmarket valuation.” He is concerned with the public's willingness to pay for different types of conservation policies. “There has been tremendous debate, both publicly and in the scientific literature, about the best way to conserve biodiversity. Yet virtually no one is measuring

IN SUMMARY

Conserving biodiversity in the Oregon Coast Range requires tradeoffs. Policy-makers must consider both the costs and benefits of new conservation programs. During this appraisal process, the costs, in terms of economic activity forgone, are often easier to quantify than the benefits. We all know that biodiversity is valuable, but how does its value compare to other important resources and services?

Researchers at the Pacific Northwest (PNW) Research Station in Corvallis, Oregon, mailed out thousands of surveys to measure the public's willingness to pay for conservation in the Oregon Coast Range. They investigated popular attitudes toward increasing endangered species habitat, salmon and aquatic habitat protection, old-growth forest conservation, and large-scale nature reserves.

Respondents generally showed a preference for the status quo and did not support any reductions in the current level of protection. They were willing to pay for increasing biodiversity conservation but only to an intermediate level, beyond which regulations were seen as burdensome. Of the programs considered, old-growth conservation had the highest level of support. These findings will be useful to policymakers who, until now, had few ways of gauging the public's preferences.

the public's support for these strategies. From a pragmatic perspective, this seems to me at least as important to successful implementation as the scientific merits of any given approach," says Garber-Yonts.

"Although we know that the public broadly supports biodiversity conservation, designing specific policies that invite public support and participation requires more understanding of preferences for different management alternatives," explains Garber-Yonts.

He and his colleagues at Oregon State University have engaged the citizens of Oregon, through surveys and focus groups, to learn how the public perceives the tradeoffs associated with conservation. They recently completed an analysis of Oregonians' willingness to pay for biodiversity protection in the Oregon Coast Range.

In recent years, conservation policy has had a significant economic impact on the people living in the Coast Range. Their local logging economy was hit hard by the spotted owl controversy and the subsequent forest conservation policies. Debate continues over salmon policy and the level of protection afforded to old-growth forests. Any future conservation

KEY FINDINGS	
•	Oregonians exhibit substantial willingness to pay for moderate increases in biodiversity conservation measures; however, large increases are seen as excessive.
•	Coast Range households exhibit the highest willingness to pay for salmon habitat conservation. In contrast, Willamette Valley residents exhibited the highest willingness to pay for endangered species critical habitat protection, increasing the proportion of old-growth forests, and the amount of land in reserved status in the three regions.
•	Although there is support for the current level of forest protection, there is a strong reluctance among many Oregonians, particularly Coast Range residents, to introduce further changes in the regulation of forest land for conservation purposes.
•	Biodiversity conservation is regarded by most Oregonians as relatively less important than many other government programs such as crime prevention, education, or transportation infrastructure.

policies are sure to come with a complex mix of costs and benefits.

Garber-Yonts wanted to reach large numbers of citizens from a cross section of the state. A mail-in survey was the most efficient and cost-effective approach. Eventually, 3,000 survey packets would be sent across the state. But first, Garber-Yonts had to design and

construct a survey that would be meaningful to the public and elicit a large response.

"The survey examined the public's willingness to pay for alternative biodiversity conservation policies and compared this to their willingness to pay for traditional social policies, like roads and schools," explains Garber-Yonts.

ASKING THE RIGHT QUESTIONS

Although there has been a longstanding scientific debate about how best to conserve biodiversity, preferences of the public have rarely been a formal part of the discourse. To successfully engage the public, Garber-Yonts had to make sure he was asking the right questions.

Biodiversity is extremely difficult to define. It exists on multiple levels and dimensions—from the scale of micro-habitats all the way to the scale of entire landscapes, and from individual species up to complex biological communities and ecosystems. As a result, biodiversity conservation is a difficult objective to describe to a lay audience. When searching the academic literature, Garber-Yonts found, literally, hundreds of different measures of biodiversity. "Many were abstract indexes of species diversity and abundance," he explains. "We had to step back and find policy mechanisms that were meaningful to the public and could readily be explained in a survey."

He assembled citizen focus groups to find measures of biodiversity that resonated with

Oregonians. Eventually, he settled on four broad conservation programs to include within the survey. Each had been implemented in some form within the state in the recent past.

The first was a species-based program, which was termed a "fine-filter approach" because it considered the habitat of individual species, one at a time. The Endangered Species Act is a familiar example of fine-filter conservation. Next, was a reserve-based strategy, or "coarse-filter approach." This included nature reserves, similar to wilderness areas, within which natural processes occur unhindered by human development. The third approach focused on freshwater and land around streams. Here, the focus was on maintaining clean water and conserving Pacific salmon. Finally, there was an option devoted to the conservation of forest structure; it was concerned primarily with the extent of old-growth forest distributed throughout the Coast Range.

"We had started out with more definitional descriptions of biodiversity, which tend to be

fairly abstract," says Garber-Yonts. "Our interaction with people in focus groups led us to use conservation programs which are directed at maintaining different elements of diversity over a range of scales. While this resulted in less direct measures of biodiversity, it incorporated additional dimensions of conservation

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as it is actually implemented on the ground. This was a fairly unique approach to take in a survey focused on public preferences.”

Once the hypothetical conservation programs were developed, Garber-Yonts got to work designing the survey. Phrasing the questions in a meaningful way was a complicated process. “If you simply ask people how much a conservation program is worth, you can get some pretty unreliable answers,” says Garber-Yonts. “People will often tell you it is worth more than they are actually willing to pay.”

Instead Garber-Yonts designed a “choice experiment.” Respondents were asked to choose specific combinations of conservation programs, with each combination having a specific cost. They were reminded that the cost would be paid through an increase in their income taxes. The presentation of the choices was designed to look like ballots that would be encountered on Election Day.

Each “ballot” had three alternatives. For example: Alternative A = No change from current conservation strategy at no cost;

Alternative B = Increase fine-filter and salmon protection while decreasing old-growth and nature reserves for a cost of \$86 per year; Alternative C = Increase all levels of biodiversity protection for a cost of \$236 per year. Each respondent would have to pick one alternative.

In the end, the survey booklet was 16 pages, contained multiple ballots, and was full of color graphics and user-friendly diagrams.

NOT TOO MUCH, BUT NOT TOO LITTLE

In June of 1999, surveys were sent to 3,000 randomly chosen people, evenly distributed among the Coast Range, the Willamette Valley, and Eastern Oregon. Garber-Yonts included a cover letter and a dollar bill in each packet.

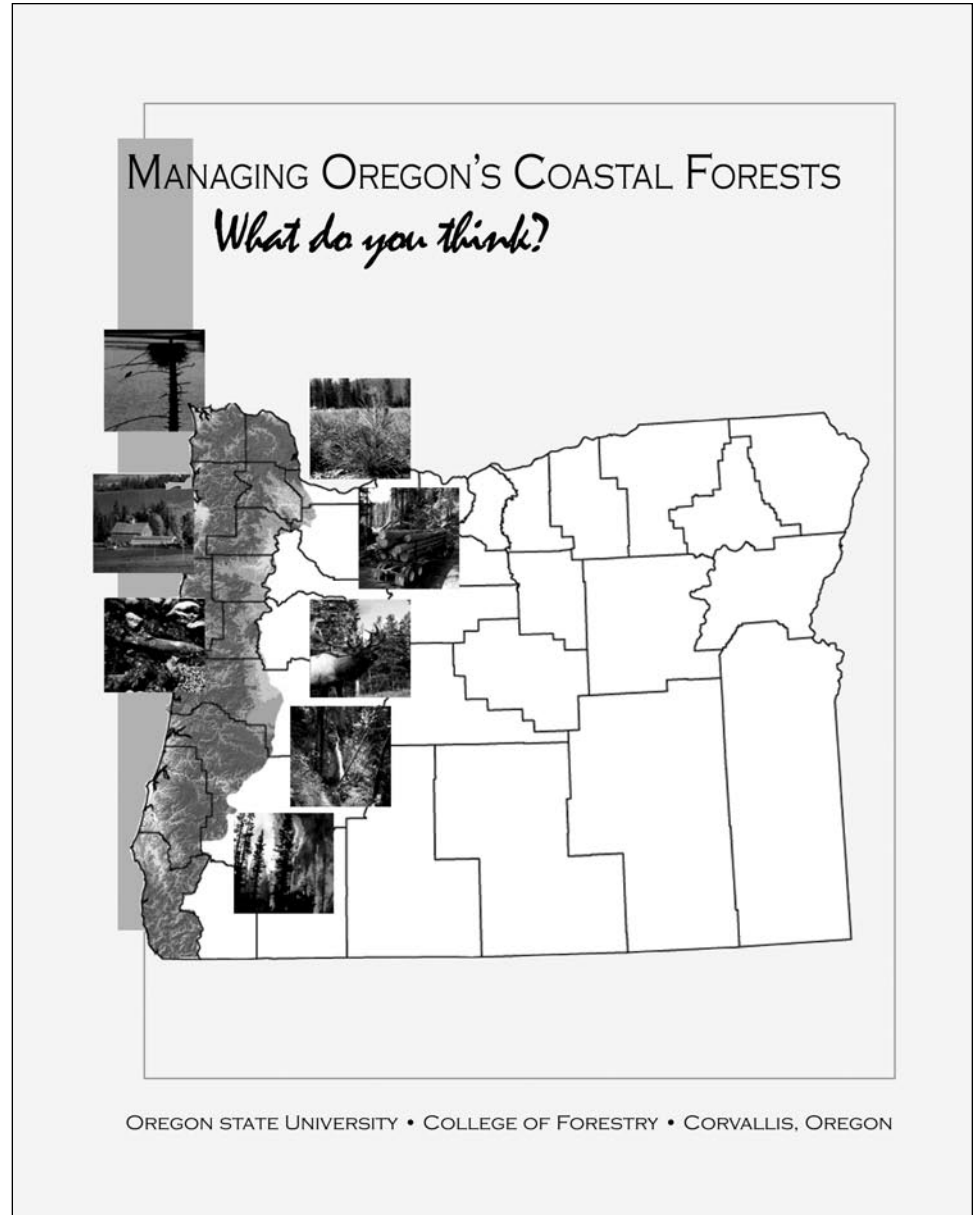
“The dollar bill gets people’s attention; you don’t often get cash with junk mail. We included it with the hope that it would develop an implicit contract with the respondent and motivate them to return the survey. We also wanted to show them our appreciation,” says Garber-Yonts. “Interestingly, some people sent back the dollar, saying that it wasn’t necessary.”

Completed surveys rolled in over the summer and within a few months, more than half of the surveys had been returned.

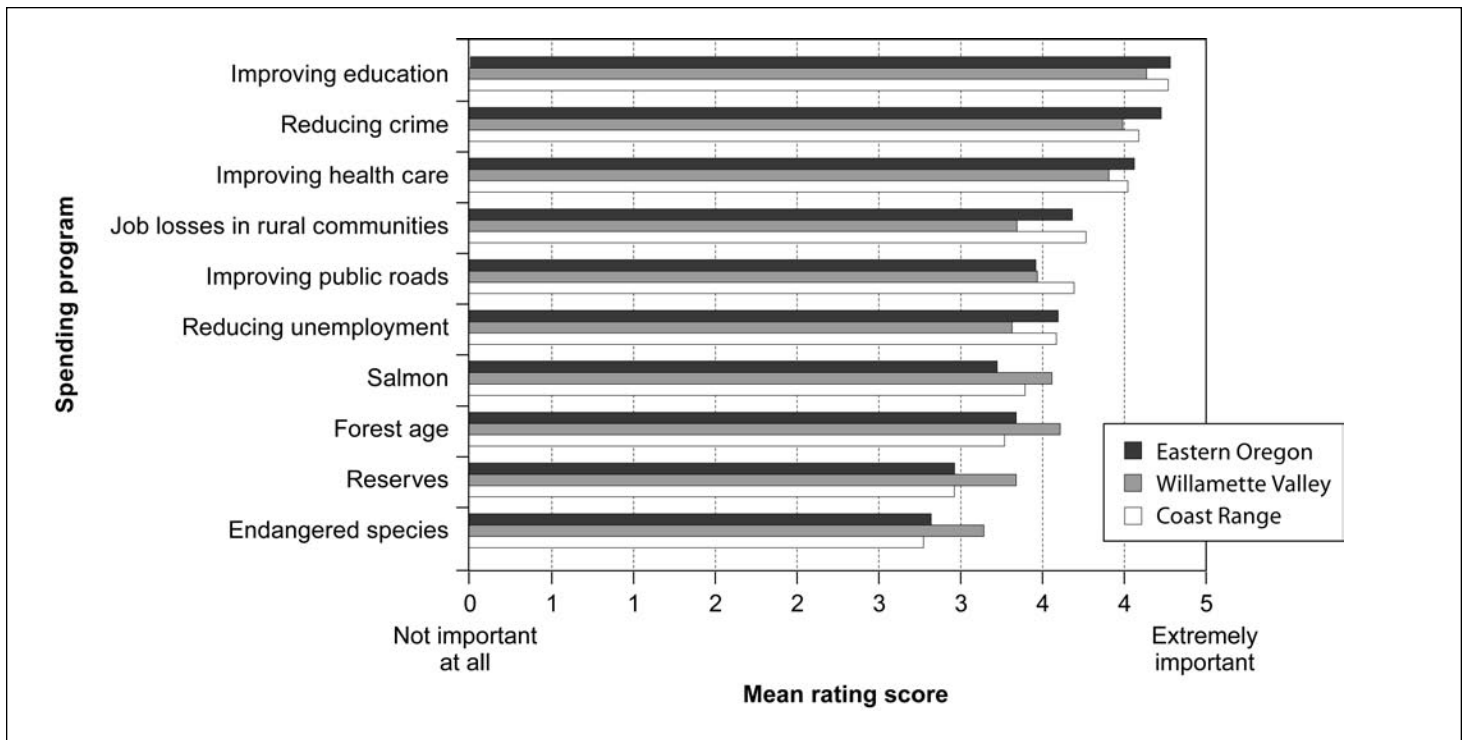
Overall, respondents were willing to pay the most for old-growth protection and restoration. On average, they would raise their annual income taxes by \$380 per household to see the proportion of old-growth forests increase from 5 to 35 percent.

“Due to all the media coverage in the past decade, old-growth is the conservation issue that Oregonians are most familiar with,” says Garber-Yonts. “Our findings indicate that they support more government spending on old-growth protection, even if it comes out of their personal budgets.”

Endangered species and salmon protection had intermediate levels of support. Respondents would approve a \$250 tax hike per year for a marginal increase in endangered species habitat. A willingness to pay for salmon protection peaked at \$144 per year. In contrast, there was a much lower inclination to pay—a maximum of only \$45 per year—for more nature reserves. Furthermore, any increase over 32 percent of the land area in reserves was regarded as excessive, meaning respondents would expect to be compensated if the government took this route.



The sixteen-page survey booklet was mailed to 3,000 Oregon households, stratified evenly between the Coast Range, the Willamette Valley, and eastern Oregon.



Oregonians tend to value social services that they perceive as providing tangible benefits over biodiversity conservation.

Four Programs: A Quick Review

Program I: Salmon Streams

This program focuses on protecting and restoring salmon habitat in Coast Range streams. This would improve conditions for endangered salmon, and would focus on bringing all populations of salmon to greater levels of abundance.

Program II: Endangered Species

This program focuses protection on the most severely threatened species. This approach gives some protection to other species using the same habitat, but generally doesn't become effective until a species is at extreme risk.

Program III: Forest Age Management

This program focuses on changing the average age of the working forests of the Oregon Coast Range. This would improve species and habitat diversity on lands managed mainly for timber production.

Program IV: Biodiversity Reserves

Instead of modifying land uses over the entire Coast Range to protect individual species, this approach reserves large patches of land from most human uses in order to protect whole ecosystems and retain natural processes.

“There is support for a moderate increase in all of the biodiversity programs we asked about—but only to a point,” explains Garber-Yonts. “There is a threshold level of protection, beyond which the program is seen as having gone too far. Once the threshold is crossed, Oregonians regard protection as overly restrictive on other uses and would expect to be compensated for the burden.”

There was also resistance to weakening any of the existing biodiversity conservation programs, particularly with regard to old-growth protection. “Scenarios that included a decrease below the current 5 percent of old-growth in the Coast Range elicited a very negative response,” says Garber-Yonts.

THE URBAN-RURAL DIVIDE

The survey also revealed some interesting regional differences. Overall, respondents from rural eastern Oregon were willing to pay the least for biodiversity conservation. They also had the lowest threshold for seeing a conservation policy as burdensome. “This seems consistent with the political conservatism and resistance to government regulation that rural eastern Oregon is known for,” says Garber-Yonts.

Residents of the Willamette Valley, who are generally the most urban-minded in Oregon, were willing to pay the most for endangered species protection, nature reserves, and old-growth. Coast Range citizens were willing to pay the most for salmon protection.

“We expected the Willamette Valley respondents to have the highest willingness to pay,” says Garber-Yonts. “Throughout the Nation, urban residents have the highest rate of membership in environmental groups and the highest support for environmental policies. More

interesting was the tendency of Coast Range respondents to pay more for salmon protection. We speculate that this is due, in part, to the constraints that are inherent in stream protection. Salmon policies would likely be confined to the area around streams and would therefore be less likely to affect wide, sweeping areas.”

Coast Range respondents, unlike those from the rest of the state, were considering policies that would affect their own backyard. They have a lot of experience—some good and some bad—with endangered species and old-growth protection over the past decade. This may explain why they were most likely to favor the no-change alternative.

But they weren't alone in their resistance to change. Each region displayed what Garber-Yonts refers to as the “status quo effect.”



“This is the tendency to refuse any alternatives for increasing or decreasing biodiversity protection, regardless of the cost or the degree



Results from the survey indicate that Oregonians are willing to pay more for the conservation of old-growth forests than for other conservation programs.



Leaving riparian buffers along streams after logging and other means of protecting salmon habitat are the favored conservation approaches for residents living within the Coast Range.

 LAND MANAGEMENT IMPLICATIONS 
<ul style="list-style-type: none"> • In addition to providing estimates of public willingness to pay for conservation of Oregon Coast Range habitats, the study provides measures of relative support for the four alternative approaches to achieving conservation goals currently in use by forest owners in the region.
<ul style="list-style-type: none"> • The willingness-to-pay figures, in addition to providing guidance to forest policy-makers, could also be used in cost-benefit analysis of alternative forest planning scenarios.
<ul style="list-style-type: none"> • Oregonians are willing to pay more to increase the proportion of old-growth forest in the Oregon Coast Range than they are to conserve additional endangered species habitat, create additional nature reserves, or increase salmon protection.

of change. The status quo effect needs to be overcome before respondents perceive any benefit from increased conservation,” he explains.

The status quo effect in the Coast Range was almost double when compared to the rest of the state. Apparently, they’ve endured enough change for a while.

CONSERVATION OR CRIME PREVENTION?

With the survey, Garber-Yonts also asked respondents to compare conservation programs to other social services, like education and unemployment.

“With the exception of Willamette Valley residents, respondents indicated that conservation was less important than any of the other spending programs in the rating question,” Garber-Yonts explains. “Willamette Valley residents, in contrast, rated salmon habitat and increasing old-growth as more important than rural community development, unemployment benefits, or improvement of public roads, but less important than education, health care, and crime prevention.”

“People tend to value social programs relative to the amount of direct benefit that they see every day,” he says. “Conservation can seem a little abstract compared to day-to-day services.”

Garber-Yonts cautions that these and the rest of the survey’s findings may have been influenced by the economic conditions of the late 1990s, particularly in the Willamette Valley. The research was completed at the height of the last decade’s economic expansion in Oregon. He suspects the results would be different, likely displaying a lower tolerance for tax hikes, if the survey were conducted in leaner times.

For this reason, Garber-Yonts stresses that the real significance of the results lie in the relative differences between approaches. “Regardless of the specific magnitude of the respondents’ willingness to pay, policymakers can use these findings to gauge the public’s acceptability of changes in Coast Range conservation programs,” says Garber-Yonts.

One thing that is clear from this research is that the relationship between Oregonians and the natural environment is not easily quantified with a simple price tag. They see great value in the conservation of biodiversity, but they don’t want regulations to break their budgets either. What remains to be seen is whether policymakers will listen to the public and develop conservation programs that reflect this complex relationship.

*“I am I plus my surroundings,
and if I do not preserve the latter,
I do not preserve myself.”*

—José Ortega y Gasset

FOR FURTHER READING

Garber-Yonts, B.; Kerkvliet, J.; Johnson, R. 2003. *Public values for biodiversity conservation in the Oregon Coast Range*. Forest Science. 50(5): 589–601.

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choices recreationists make between settings for recreational activities. He is a member of the Land Use and Land Cover Dynamics team with Ralph Alig (team leader), Jeff Kline, and Eric White. The team Web page is at <http://www.fsl.orst.edu/lulcd/>.

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