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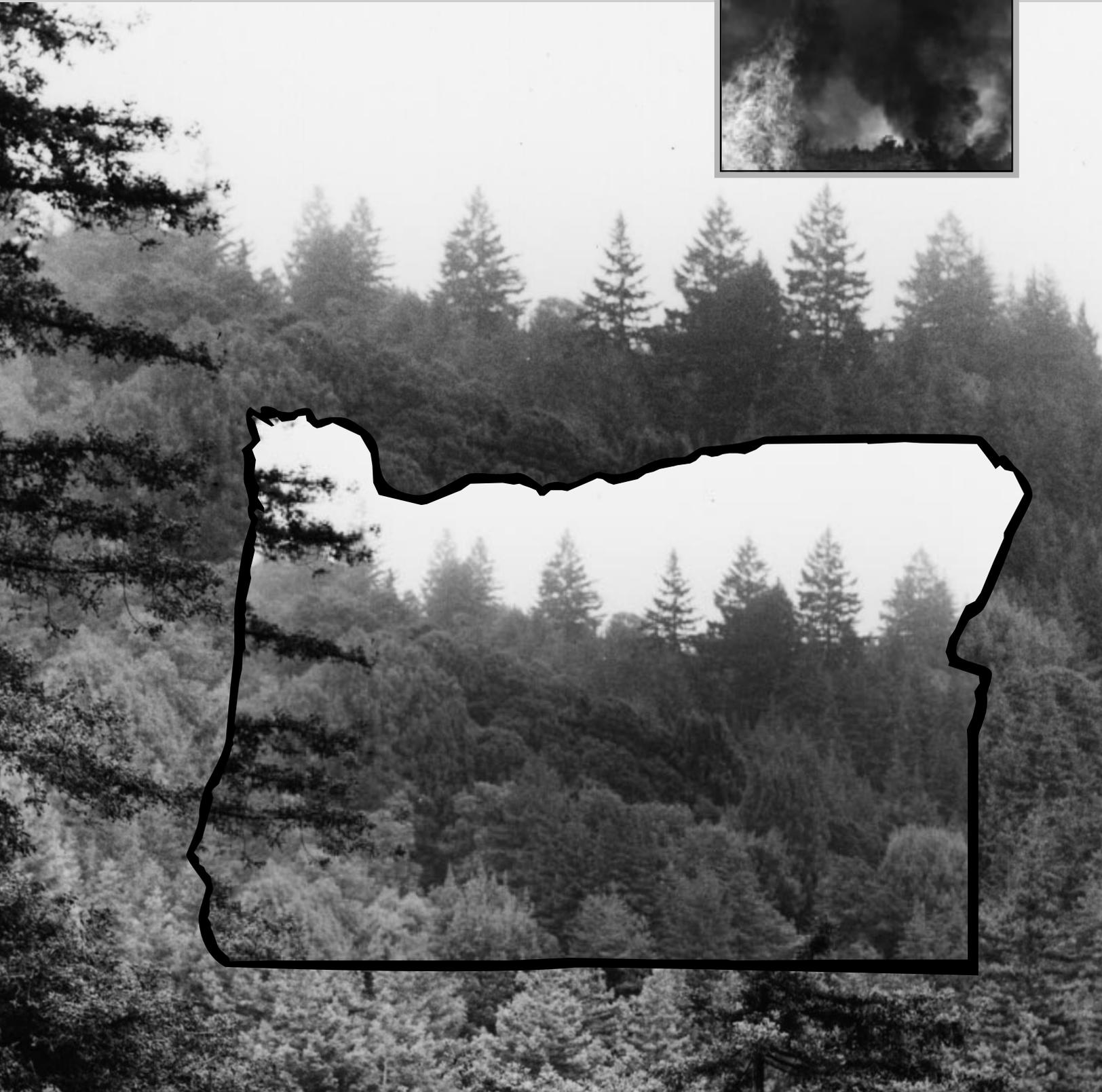
**Pacific Southwest
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A Contingent Valuation Study of the Value of Reducing Fire Hazards to Old-Growth Forests in the Pacific Northwest



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Abstract:

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A contingent valuation methodology was applied to old-growth forests and critical habitat units for the Northern Spotted Owl in Oregon to estimate the economic value to the public in knowing that rare and unique ecosystems will be protected from fire for current and future generations. Generalizing to the whole state, the total annual willingness-to-pay of Oregon residents ranges from \$49.6 to \$99 million. In terms of old-growth forests protected from fire, the value is \$28 per acre.

Retrieval terms: contingent valuation, fire economics, NOAA, nonmarket resources, old-growth valuation, willingness-to-pay

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In Brief

There is a growing recognition that protection of forest products beyond recreation needs to be incorporated into decisionmaking. Valuation of these other products often reflects people's desire to know that rare and unique ecosystems exist (existence value) and will be protected for future generations (bequest values) and that they will be available for visits at future times (option values). Existence and bequest values have been quantified (in dollar terms) to stop logging of old-growth forests in Washington and Colorado but not to protect these ecosystems from fire.

About 7 million acres of the remaining old-growth forests in the Pacific Northwest have been designated as Critical Habitat Units (CHU's) for the Northern Spotted Owl by the USDI Fish and Wildlife Service. This designation eliminates clearcutting and severely restricts the logging that can be done. The last significant threat to preservation of these habitats stems from possible catastrophic fires. Fire management policies can reduce the frequency of human-caused fires and the extent and severity of all fires.

The main objective of this research is to provide a case study of the contingent valuation method (CVM) for measuring the economic value (sum of recreation use, option, existence, and bequest values), and thus willingness-to-pay (WTP), for protecting old-growth forests in Oregon from catastrophic fires. The CVM obtains an individual's estimate of WTP for use or preservation of natural resources through creation of a simulated market. The simulated market is conveyed in a mail questionnaire or a telephone or in-person interview. In this research, we used a mail questionnaire.

All technical information on fire and fire effects was obtained from USDA Forest Service and USDI Fish and Wildlife personnel in Oregon and was used in the development and pretesting of the survey questionnaire. The following are three important elements of all CVM surveys: resource to be valued, financial mechanism to be used to pay, and the question format used to elicit the respondent's dollar amount of WTP.

Two versions of the survey were sent to two random samplings of 500 Oregon households each. In Version 2, respondents were reminded, before they answered the willingness-to-pay question, about other substitute resources and their budget constraint; in Version 1, respondents were not reminded. Households were randomly assigned to one of 20 alternative program cost levels of the two treatment samples. The overall survey design and mailing procedure followed Dillman's total design method. The results and response rates between versions were almost identical. The mean open-ended WTP responses were \$33 for Version 1 and \$36 for Version 2. The mean dichotomous choice WTP responses were \$92 for Version 1 and \$98 for Version 2. Pooling the data showed a mean dichotomous choice WTP of \$90 per household.

The similarity of WTP responses across survey versions can be interpreted to mean that respondents already take into account their budget and competing public and private alternative expenditures when providing their WTP responses. An alternative interpretation is that when dealing with any hypothetical scenario, people do not seriously consider the real dollar consequences of their survey responses regardless of whether they are reminded. Without a validity test forcing respondents to actually pay, we cannot distinguish between these two possible explanations.

The external validity of the sample values is of critical concern when applying the findings to the population (Arrow and others 1993). Applying the findings to Oregon's population yields WTP values ranging from \$45 to \$90 per household or a state aggregate of \$49.5 million to \$99 million

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annually, depending on how similar the values of nonrespondents are to those of respondents.

Dividing a middle estimate of WTP of \$84.6 million annually by the 3,500 acres that would no longer burn results in a value to the public of \$24,170 per acre saved from fire. In terms consistent with the USDA Forest Service fire management analysis system, dividing the \$84.6 million by the total acreage of old-growth forests in CHU's for the Northern Spotted Owl yields a value to the public of \$28 per acre protected.

Current Federal fire management policies take into account the economic values of several traditional forest products such as timber, range, water, game wildlife, and recreation in decisions about the type and level of fire suppression. Many other important forest "products" including preservation of biodiversity and related nongame animals, however, are not formally included as part of the USDA National Fire Management Analysis System (NFMAS).

There is a growing recognition within the Wildland-Urban Interface Research Work Unit at the Pacific Southwest Research Station's Forest Fire Laboratory in Riverside, California, that protection of forest products beyond recreation needs to be incorporated into decisionmaking (González-Cabán and Chase 1991, González-Cabán 1993). Valuation of these other products often reflects peoples' desire to know that rare and unique ecosystems exist (e.g., existence value, first proposed by Krutilla [1967]) and will be protected for future generations (bequest value) and that they will be available for visits at future times (option value). The existence and bequest values have been quantified (in dollar terms) to stop logging of old-growth forests in Washington (Rubin and others 1991) and Colorado (Walsh and others 1984), but not for protecting these ecosystem types from fire.

In the Pacific Northwest only a small percentage of old-growth ecosystem remains on National Forest lands. About 7 million acres of these old-growth forests have been designated as critical habitat units (CHU's) for Northern Spotted Owl by the USDI Fish and Wildlife Service. This designation eliminates clearcutting and severely restricts logging. However, one significant threat to preservation of habitat in these areas stems from possible catastrophic fires. Fire management policies can reduce the frequency of human-caused fires and the extent and severity of all fires.