

Snake River Salmon and Steelhead Survey

Summary Results

Wednesday, January 3, 2001

The Snake River Salmon and Steelhead Survey was part of a cooperative class project for students in the Environmental and Natural Resource Economics seminars at Reed and Whitman Colleges undertaken in the Fall 2000 semester. The project was designed by Professors Noel Netusil of Reed College and Jan Crouter of Whitman College to provide students with a hands-on introduction to one method of estimating the benefits of an environmental good or service for which there are some important non-market values. The method employed was the Contingent Value Method (CVM), which attempts to estimate benefits of a good or service by asking people if they are willing to pay for a hypothetical, but realistic, change in a good or service. For our class project, we used the Contingent Value Method to estimate the benefits of restoring four runs of Snake River salmon and steelhead that have been listed as threatened or endangered under the Endangered Species Act. We used the World Wide Web to administer the survey because it allowed us to disseminate the survey, collect data and analyze the results within the semester-long period of our courses. We are immensely grateful to those who participated in the survey and who helped spread word of the survey to others.

An ideal survey provides respondents clear, understandable and unbiased information about the environmental good or service in question so that respondents can provide informed answers to survey questions without being burdened by so much information that they are deterred from completing the survey. Respondents are asked questions about their attitudes and personal characteristics in addition to a question or questions about whether they are willing to pay a specific amount of money for the environmental good or service so that the researchers can observe how attitudes and demographic characteristics might be correlated with the willingness-to-pay responses. An ideal survey includes a set of questions that balances the researchers' needs to explore certain questions while not taxing the stamina of the survey respondents. Finally, an ideal survey is administered in a way that draws a sample of respondents who are roughly representative of the relevant population.

Our students quickly discovered (and we were reminded) that it is very difficult to design and administer an ideal survey, and the comments of survey respondents made clear some weaknesses in our survey. With respect to the information section of the survey, many respondents perceived a bias toward restoring runs of Snake River Salmon and Steelhead and some felt that important information was excluded. The most commonly cited exclusion was about the costs of restoring the fish runs, but other respondents felt that the effects of Native American harvest practices and the complicated relationships of hatchery versus wild fish received inadequate treatment in the survey information. With respect to the survey questions, an attitudinal question about the importance of the Snake River as a means of transport was inadvertently omitted, an attitudinal question about the substitutability of hatchery and wild fish was perplexing without more context for the question, and the demographic question about the state in which the respondent resides did not permit us to distinguish those who lived in the Snake River Basin from those who did not. Finally, the internet administration of the survey as well as the pathways through which others were informed about the survey automatically introduced sources of sample selection bias.

Our goals were that students learn how to undertake a contingent value study and interpret data from a survey to estimate the benefits of some environmental good or service, and to demonstrate to themselves the promises and hazards of valuation of environmental goods and services. In this we feel the project was very successful. A good deal of this success is due to those who participated in the survey by answering the survey questions and offering their own comments and to those who disseminated word of the survey to others. We present a summary of the survey results below for interested participants and others. We remind the reader that the survey was designed as a teaching and learning exercise, and not to drive policy regarding the Snake River salmon and steelhead.

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Part One: Summary of Responses to Attitudinal Questions

This section presents the data entered by respondents (in percentage format) for the first part of the survey, entitled “Your Familiarity with the Issues and Your Attitudes”. These questions ask respondents their knowledge of the pertinent issues before having read the provided background information, as well as their opinion on use values for several different operative use categories of the Lower Snake River. A total of 480 observations were in the dataset. Twenty-nine observations that were generated when people viewed, but did not fill out the survey, were deleted, leaving a total of 451 observations.

1. Prior to reading the background information pages, how familiar were you with:
 - a. the Endangered Species Act?
 - Not familiar - 5.7%
 - Familiar - 46.1%
 - Very Familiar - 47.9%
 - Not Sure - 0%
 - b. efforts to restore threatened and endangered Snake River salmon and steelhead?
 - Not familiar - 15.0%
 - Familiar - 41.7%
 - Very Familiar - 41.9%
 - Not Sure - 0.7%
2. Have you visited or lived in the U.S. Pacific Northwest (Washington, Oregon, Idaho)?
 - Yes - 87.4%
 - No - 11.7%
 - N/A - 0.9%
3. Have you observed salmon and/or steelhead while fishing, visiting dams, or visiting hatcheries?
 - Yes - 76.7%
 - No - 22.6%
 - N/A - 0.7%
4. Do you expect to observe and/or fish for salmon or steelhead in the future?
 - Yes - 84.9%
 - No - 14.4%
 - N/A - 0.7%
5. In your view, are hatchery programs an acceptable means of restoring endangered and threatened Snake River salmon and steelhead?
 - Yes - 47.9%
 - No - 51.4%
 - N/A - 0.7%

Summary of Responses to Attitudinal Questions

6. Think about the ways the Lower Snake River is important to you in light of where you live, how you or thers in your family are employed, your recreational activities, and your values. Below are listed some uses of the Lower Snake River that might be important to you. How important to you is each of the following uses? Click one radio dial for each use listed. The Lower Snake River is important for:

a. reservoir-related recreational opportunities (e.g. lake fishing, lake boating, sailing, water skiing, wind-surfing);

N/A - 0.7%
 Not Important - 47.9%
 Slightly Important - 26.2%
 Important - 17.3%
 Extremely Important - 7.5%
 Not Sure - 0.4%

b. in-river recreational opportunities associated with free flowing river sections (e.g. river fishing, rafting, tubing);

N/A - 1.1%
 Not Important - 16.0%
 Slightly Important - 24.8%
 Important - 29.5%
 Extremely Important - 28.4%
 Not Sure - 0.2%

c. a source of electricity;

N/A - 1.1%
 Not Important - 25.1%
 Slightly Important - 31.7%
 Important - 19.3%
 Extremely Important - 21.7%
 Not Sure - 1.1%

d. habitat for salmon and other fish;

N/A - 0.1%
 Not Important - 0.9%
 Slightly Important - 3.1%
 Important - 20.4%
 Extremely Important - 74.9%
 Not Sure - 0%

e. habitat for birds and other wildlife;

N/A - 0.9%
 Not Important - 1.3%
 Slightly Important - 5.5%
 Important - 28.6%
 Extremely Important - 63.6%
 Not Sure - 0%

f. a source of water supply;

N/A - 0.9%
 Not Important - 16.0%
 Slightly Important - 19.7%
 Important - 33.9%
 Extremely Important - 27.2%
 Not Sure - 2.2%

g. a source of salmon for commercial harvest;

N/A - 1.1%
Not Important - 26.6%
Slightly Important - 30.8%
Important - 25.7%
Extremely Important - 14.0%
Not Sure - 1.8%

h. fulfilling salmon-related treaty obligations to Native Americans;

N/A - 0.9%
Not Important - 13.1%
Slightly Important - 17.5%
Important - 29.9%
Extremely Important - 37.5%
Not Sure - 1.1%

i. a source of jobs;

N/A - 0.7%
Not Important - 11.5%
Slightly Important - 31.7%
Important - 35.9%
Extremely Important - 18.2%
Not Sure - 2.0%

Part Two: Willingness to Pay

A. Summary of Responses to the Willingness to Pay Questions

Each respondent was randomly presented with one of 20 versions of question 7, the willingness-to-pay question, and then a follow-up question was presented, based upon the respondent's answer to this initial willingness to pay question. A willingness to pay question featured one of 10 different "bid" amounts (from \$2 per year over ten years up to \$250 per year over ten years) and one of two types of fish restoration (all wild or half wild and half hatchery). For example, the version below poses a bid amount of \$2 per year for 10 years for the restoration of runs of the four populations entirely through increases in wild fish:

Suppose that salmon and steelhead recovery efforts undertaken by the local, state, and federal agencies would increase runs of the four Snake River salmon and steelhead fish to the target levels specified in the draft recovery strategy within 50 years as indicated in the table below.² Suppose that the increases would be wholly due to increases in wild fish in this scenario. Suppose, further, that the costs of these recovery efforts by state, local and federal agencies would be born by all U.S. taxpayers and funded solely through increases in federal income taxes.

	Estimated Annual Spawner Abundance (annual average over past 4-5 years at Lower Granite Dam	Hypothetical Abundance Levels under Recovery Programs
Snake River Spring/ Summer Chinook	4,800 wild 4,800 hatchery ³	31,000 wild 4,800 hatchery
Snake River Fall Chinook	600 wild 500 hatchery	2500 wild 500 hatchery
Snake River Sockeye	5 (all from captive broodstock)	2000 wild
Snake River Steelhead	8,300 wild 60,000 hatchery	30,000 wild 60,000 hatchery

7. Suppose that these hypothetical salmon recovery efforts cost your household \$2 each year for 10 years. Keeping in mind your total household budget, would you vote in favor of these government recovery efforts?

Respondents' answers to this question for different bid amounts are reported below:

	2	10	20	30	40	50	100	150	200	250
Yes	30	34	31	36	34	48	33	35	33	31
No	3	6	12	6	7	10	15	15	11	18
%yes	90.9	85	72.1	85.7	82.9	82.8	68.8	70	75	63.3

B. Estimated Mean Willingness to Pay

Three Probit regressions, each with a different combination of different explanatory variables, yielded estimates of mean willingness to pay that varied from about \$200 per year to \$250 per year for the entire sample. As expected, willingness to pay is higher for members of environmental groups and for higher income households. Interestingly residents of the Pacific Northwest exhibited a lower mean willingness to pay than that of the full sample.

Part Three: Summary of Responses to the Demographic Questions

Below are some summary statistics regarding the demographic characteristics of the survey respondents:

Percentage who have visited the PNW: 88%

Gender: 68% Male
32% Female

Average age: 40.8 years

Residence: PNW (ID, OR, and WA): 57%
West (including PNW): 73%
Midwest: 4%
South: 18%
Northeast: 3%
Washington D.C. <1%

Ethnic background: African American or Black: 0%
Asian American: 1%
Caucasian or White: 93%
Hispanic or Latino: 1%
Native American Indian: 1%
Pacific Islander: 0%
Other: 2%

Education: Completed High School 98.9%
Completed College 78.7%
Average number of years of education completed: 16.8 years

Annual income: Mean: \$62,206
Median: \$55,000

Current Primary Employment:

Agriculture, Forestry, Fishing, Hunting: 14%
Professional, Scientific, and Technical Services: 28%
Mining: 0%
Administrative, Support, Waste Management, and Remediation Services: <1%
Construction: <1%
Manufacturing: 2%
Educational Services: 12%
Utilities: <1%
Health Care and Social Assistance: 2%
Transportation and Warehousing: 0%
Arts, Entertainment and Recreation: <1%
Wholesale Trade: <1%
Other Services (except Public Administration): 13%
Retail Trade: <1%
Management of Companies and Enterprises: 1%
Accommodation and Food Services: <1%
Retired: 5%
Finance and Insurance: 2%
Student: 14%
Real Estate and Rental and Leasing: <1%
Homemaker: <1%
Other: 9%

Percentage who are members of environmental groups: 58%

A comparison of the demographic characteristics of our survey respondents with those of the general population suggests that sample heavily represented Pacific Northwest residents. In addition our respondents were more likely white, male, Caucasian, highly educated, and employed in professional and educational jobs than the general population.