

Public Values Related to the Willamette River Mainstem in Oregon
FOCUS GROUPS & INTERVIEWS
EPA ICR No. 2205.08
SUPPORTING STATEMENT

Part A

Section 1. Identification of the Information Collection

1(a) Title of the Information Collection:

Public Values Related to the Willamette River in Oregon

1(b) Short Characterization/Abstract:

The purpose of this study is to conduct human subjects research regarding ecosystem services of streams, to: 1) test the “final ecosystem services” approach as a cognitive tool; 2) help define “final ecosystem services” of the Willamette River; 3) help define “final ecosystem services” of streams in general; and 4) inform stream monitoring efforts such that items of direct interest to people are included. This project is intended as part of EPA’s Ecosystem Services Research Program (ESRP). Better characterization of stream ecosystem services in publicly-accessible language is needed to establish a firm common ground for interdisciplinary research between natural and social scientists. A series of focus groups and interviews are planned. Final ecosystem services are those environmental features having direct relevance to people. As an example, although stream monitoring efforts often collect data on dissolved oxygen, reports on dissolved oxygen levels may not be meaningful to the average person. It may be that something such as the abundance of different fish species is of more import. The final ecosystem services concept is discussed more in section 2 below, and further references given.

Section 2. Need for and use of the Collection

2(a) Need/Authority for the Collection

Further understanding of how ecosystems are important to people is needed to make better natural resources management choices, and to prioritize environmental research efforts. The “Ecosystem Services” concept conveys the message of connecting natural science to human health and well-being, but there are competing definitions about what ecosystem services actually are, with repercussions for how to manage and research them. Better characterization of public benefits of environmental management is one of the goals of EPA’s Ecosystem Services Research Program (ESRP).

With an emphasis on guiding national stream monitoring, an EPA-sponsored workshop was convened in July, 2009 to hypothesize priority stream ecosystem services for different user groups (Ringold et al., 2009, see especially page 22). The central concept was “final ecosystem services”, attributable to Boyd and Banzhaf (2007), further developed in Boyd and Krupnick (2009). Final ecosystem services are defined as “...components of nature, directly enjoyed, consumed, or used to yield human well-being” (Boyd and Banzhaf 2009). Final ecosystem services were hypothesized and listed at the workshop, and have been refined by an EPA research team thereafter located at the Western Ecology Division in Corvallis, Oregon. Further empirical testing with human subjects is needed to assess whether the final ecosystem services-based approach can assist in capturing what is important about streams for different types of human beneficiaries. Furthermore,, empirical research is needed to generate qualitative data upon which to build theories about what those salient features of streams actually are for different types of human beneficiaries. . The qualitative data is expected to supply a foundation for follow-up environmental preference survey research by either EPA research or non-EPA research. This step would be needed to shift from the theory-building phase of qualitative research to the hypothesis-testing phase of quantitative research.

Amidst widespread research interest in ecosystem services, there appears to be relatively little human subjects research specifically designed to inform a consistent categorization of what natural sciences data are important to the public (see Maynard et al. 2010 for an Australian exception), and there are no known published human subjects studies associated with the final ecosystem service concept. The goal for this study is to produce such a list of services drawn from human subject interactions. This will constitute a social sciences grounding for items deserving focused interdisciplinary study between natural and social scientists, including stated preference valuation surveys. If this information is not collected, a lack of focus and reduced effect is possible for ecosystem services research associated with the Willamette River, and an important opportunity to connect natural and social science will be lost. There are numerous candidates for natural sciences study and there appears to be great advantage in narrowing the field of potential priorities by employing systematic interaction with human subjects, the actual beneficiaries of ecosystem services.

Boyd, J., and S. Banzhaf. 2007. What Are Ecosystem Services? The Need For Standardized Environmental Accounting Units. *Ecological Economics* 63:616-626.

Boyd, J., and A. Krupnick. 2009. The Definition and Choice of Environmental Commodities for NonMarket Valuation. *Resources For the Future Discussion Paper* 09-35.

Maynard, S., D. James, and A. Davidson. 2010. The Development of an Ecosystem Services Framework for South East Queensland. *Environmental Management* 45:881-895.

Ringold, P.L., J. Boyd, D. Landers, and M. Weber. Report from the Workshop on Indicators of Final Ecosystem Services for Streams. Meeting Date: July 13 to 16, 2009, EPA/600/R-09/137. 56 p. <http://www.epa.gov/nheerl/arm/streameco/index.html>

2(b) Practical Utility/Users of the Data

There is a broad community of researchers working on ecosystem services, including over one hundred scientists associated with EPA's own ESRP within the Office of Research and Development. Taking the ESRP example, while the overall framework of managing ecosystem services to enhance human health and well-being makes sense, there have been persistent questions about how scientists should focus their efforts, i.e. which ecosystem services should be targeted for research and how exactly these should be defined. Such questions are particularly apropos for coordinating a nationwide research effort.

Users of the data from this proposed study include the community of ecosystem service researchers, both within and outside of the EPA that are looking for a process to define ecosystem service targets or demonstrated stream-related ecosystem service targets. A specific beneficiary is EPA's stream monitoring program, which as noted in the abstract is attempting to better incorporate human priorities.

Participation in the interviews and focus groups will be voluntary and the identity of the participants will be kept confidential to the extent permitted by law. When stakeholder groups are engaged, only the names of the stakeholder groups will be reported, and in that case only with the participant's permission: the identity of the participants themselves will remain confidential to the extent permitted by law.

Focus groups and interviews generally do not yield meaningful quantitative findings and do not yield data about public opinion that can be generalized. As such, they cannot be used directly to quantify benefits and costs associated with a specific environmental action. However, these qualitative techniques are important to test and refine ideas.

Section 3. Non duplication, Consultations, and Other Collection Criteria

3(a) Non duplication

Ecosystem services research in general, and the final ecosystem services concept in particular, are recent and have not yet received adequate empirical grounding to deliver an overall classification structure or system to help prioritize natural sciences data collection for streams. There are however numerous studies that have had similar goals. It is typical for environmental economics valuation studies to convene focus groups and conduct interviews to help define the items used in a survey instrument. However there are relatively few articles establishing qualitative research protocols for the environmental economics field, for the few studies thus far identified see Hoehn et al. 2003, Johnston et al. 1995, and Kaplowitz and Hoehn 2001. None of these studies offers a recommended list of items on which to focus for natural scientists working on streams.. Furthermore there continues to be surprising variety in the ways environmental commodities (for streams and other resources) have been defined for surveys (Boyd and Krupnick 2009) limiting the transferability of existing work.

This proposed study features a more deliberative and expanded use of qualitative data than what seems to be typical of environmental economics studies. The Willamette basin has received intensive study and there are precedents for what items associated with the river are important to study and report (e.g. Hulse et al., eds. 2002). Insights from regional studies such as this help provide background information for focus group and interview sessions.

This project is a companion study in western Oregon for a similar ICR under which qualitative research is being conducted in southern Arizona (EPA ICR No. 2205.02). There are numerous differences between the two regions in both sociodemographics and ecological conditions of streams. For example, in southern Arizona the presence of perennial surface water is relatively scarce, but relatively abundant in western Oregon. Furthermore, the ecological resources that people may associate with streams in southern Arizona, such as a shading tree canopy, may receive more attention in that desert climate as compared with the milder climate of western Oregon. An attempt will be made to compare whether the theories built about what is important to people about their regional stream resources seem to agree or disagree across the two geographies. This may lead to insights about how well the theories built from qualitative data in one region do or do not seem to fit in other regions. In both geographies, research conducted under the ICR is intended to generate sufficient information upon which to follow-up with stated preference survey research to estimate the public value of marginal changes in final ecosystem services of streams.

Based on a literature review, to the applicant's knowledge, none of the information submitted to EPA during these focus groups and interviews is already in the possession of the Federal Government. The proposed focus groups will address the needs of the Agency and significantly improve our ability to test and refine ideas regarding final ecosystem services of streams.

Hoehn, J.P., F. Lupi, and M.D. Kaplowitz. July 2003. Untying a Lancastrian bundle: valuing ecosystems and ecosystem services for wetland mitigation. *Journal of Environmental Management* 68(3): 263-272.

Hulse, D., S. Gregory, and J. Baker, eds. 2002. *Willamette River Basin planning atlas: trajectories of environmental and ecological change*. Oregon State University Press, Corvallis, Oregon, USA. Available online at:
http://www.fsl.orst.edu/pnwerc/wrb/Atlas_web_compressed/PDFtoc.html

Johnston, R.J., T.F. Weaver, L.A. Smith, and S.K. Swallow. Contingent Valuation Focus Groups: Insights from Ethnographic Interview Techniques. *Agricultural and Resource Economics Review*, April 1995, 56-68.

Kaplowitz, M.D., and J.P. Hoehn. February, 2001. Do focus groups and individual interviews reveal the same information for natural resource valuation? *Ecological Economics* 36(2): 237-247.

3(b) Public Notice Required Prior to ICR Submission to OMB

Not required for an information collection under the existing generic approval.

3(c) Consultations

Every effort will be made to incorporate best practices guidance for focus group and individual interviews for this study through an ongoing literature review. The references that discuss qualitative research (in addition to those cited in section 3(a) above) that have been reviewed thus far are cited below. Communication is ongoing with environmental economists and other professionals outside the Agency that have experience with qualitative research, or who are also actively working towards understanding public attitudes towards rivers and streams. None of these persons is currently contracted to be a part of this study, and their consultation is casual. Names and affiliations of persons with whom consultation relevant to this project has occurred, either in-person, via email, or over the phone, are: Marisa Mazzotta, an independent consultant and adjunct faculty with the Department of Environmental and Natural Resource Economics at the University of Rhode Island; Robert Johnston, professor of Economics at Clark University; Rick Bastasch, program coordinator for the city of Portland, OR Office of Healthy Working Rivers; Elliot Maltz, professor of marketing, Willamette University; Katherine MacTavish, professor in the college of Health and Human science, Oregon State University; Leslie Richards, professor in the college of Health and Human science, Oregon State University; Kerri Jean Ormerod, Udall Center for Studies in Public Policy, University of Arizona; Jim Boyd, Resources For the Future; and John Hoehn, professor of environmental and natural resource economics at Michigan State University. In addition, a practice focus group was conducted with several federal employees at the Western Ecology Division in Corvallis, Oregon, and their feedback gathered afterwards from a participant perspective.

Morgan, D.L., and R.A. Krueger. 1998. *Focus Group Kit* (6 volumes). Sage Publications, Thousand Oaks, CA.

Creswell, J.W. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. 2nd Edition. 2007. Sage Publications, Thousand Oaks, CA.

Patton, M.Q. *Qualitative Research and Evaluation Methods*. 3rd Edition. 2002. Sage Publications, Thousand Oaks, CA.

Denzin and Lincoln. *The Sage Handbook of Qualitative Research*. 3rd Edition. 2005. Sage Publications, Thousand Oaks, CA.

Corbin, J., and A. Strauss. *Basics of Qualitative Research*. 3rd Edition. 2008. Sage Publications, Thousand Oaks, CA.

Lindlof and Taylor. *Qualitative Communication Research Methods*. 3rd Edition. 2011. Sage Publications, Thousand Oaks, CA.

Kempton, W.M., J.S. Boster, and J.A. Hartley. 1995. *Environmental Values in American Culture*. Massachusetts Institute of Technology Press, Cambridge, MA.

Bernard H.R. *Research Methods in Anthropology*. 3rd Edition. 2002. Altamira Press. Walnut Creek, CA.

Liamputtong, P., and D. Ezzy. *Qualitative Research Methods*. 2nd Edition. 2005. Oxford University Press. Victoria, Australia.

Charmaz, K. Constructing Grounded Theory. 2006. Sage Publications. London, UK.

Rubin, H.J., and I.S. Rubin. Qualitative Interviewing. 2nd Edition. 2005. Sage Publications. Thousand Oaks, CA.

3(d) Effects of Less Frequent Collection

Each focus group or interview will be a one-time collection exercise for the enrolled participants.

3(e) General Guidelines

This collection does not violate any of OMB's general guidelines for information collections.

Information will be collected according to the guidelines in 5 CFR 1320. Respondents will be asked to participate in one focus group or interview and their participation will be voluntary. There will be no need for participants to maintain records or submit documents or proprietary trade secrets. There will be complete protection of any demographic information collection from participants—full names, phone numbers and addresses will not be associated with responses.

EPA has developed EPA Information Quality Guidelines (2002) to ensure the utility, objectivity and integrity of information that is disseminated by the Agency. It is EPA's intention that collection of information under this ICR will result in information that will be collected, maintained, and used in ways consistent with both the EPA Information Quality Guidelines (2002) and the OMB Information Quality Guidelines (2002). EPA intends to conduct a pre-dissemination review when the Agency prepares to disseminate information collected under this ICR.

3(f) Confidentiality

Each focus group and interview will fully conform to federal regulations - specifically the Privacy Act of 1974 (5 U.S.C. 552a), the Hawkins-Stafford Amendments of 1988 (P.L. 100-297), and the Computer Security Act of 1987.

3(g) Sensitive Questions

No questions will be asked that are of a personal or sensitive nature.

Section 4. The Respondents and the Information Requested

4(a) Respondents/SIC Codes

Up to one-hundred and seventeen (117) focus group / interview participants who reside in the Willamette Basin of Oregon

4(b) Information Requested

- (i) Data items, including record keeping requirements
- (ii) Respondent Activities

Respondents will be asked to participate in a moderated focus group discussion or an individual interview regarding the Willamette River. It is expected that these sessions will be held in multiple locations to minimize travel requirements for respondents. Respondents will be asked their thoughts, perceptions and beliefs in relationship to the

river. When possible, the moderator/interviewer will ask them to ground their responses with their experiences with the river. The collection will be a one-time event and there will be no need for participants to maintain records or submit documents or proprietary trade secrets. There will be complete protection of any demographic information collection from participants -- names, phone numbers and addresses will not be associated with responses.

A draft script can be found in Appendix 1. The draft script is preliminary and will be subject to change based on the outcomes of the focus group discussions.

Section 5. The Information Collected - Agency Activities, Collection Methodology, and Information Management

5(a) Agency Activities

Agency activities associated with this information collection will include:

- Revising focus groups and interview scripts and accompanying materials. See Appendix 1 for a draft script for the initial interviews and focus groups.
- Moderating focus groups and conducting one-on-one interviews.
- Summarizing focus group & interview results
- Preparing a survey instrument
- Gathering feedback on a draft survey instrument

5(b) Collection Methodology and Management

Focus group and interview studies are directed group discussions that do not produce quantitative data, but which enable skilled observers to understand more about the underlying views and assumptions of the group or individual from the discussion. To facilitate interpretation, discussions will be recorded and/or videotaped so that both a record of the discussion will be available for review. Participants are informed in advance that the sessions will be recorded. Transcripts and video tapes will be maintained in the individual project files over the appropriate time frame under records management procedures.

This study will seek to contact both members of the general public, and contacts with organizations known to have a stake in the Willamette River. Stakeholders representing the range of EPA 'clients' will be sought, including municipal, industrial, agricultural, recreational, cultural, and environmental NGO groups. These categories are modeled after the matrix of "Stream Attributes Posited to be Components of Final Ecosystem Services to Specific User Categories and Subcategories" in Ringold et al. 2009, page 22 (a weblink for this reference is provided in section 3(a) above). Approximately half of the participants are anticipated to be from the general public, and half from stakeholder groups. Qualitative research recruiting will not yield a large enough sample to be representative of the population. Thus, random samples are not a necessity, although this research will still attempt to capture a broad range of viewpoints. Members of the general public will be approached through means that may include: advertising in the local paper; random digit dialing in the region; and posting on freely accessible websites frequented by a broad cross-section of persons. Once potential participants are contacted, they will be screened based on their location of residence, age, race, and income in attempts to reasonably match census characteristics for the region (although again, statistically significant inference about the general population will not be possible with small sample sizes). Potential participants from the general public may be incentivized for their participation through monetary compensation and provision of refreshments at the meeting. The reason for incentives such as these are to limit self-selection from the set of persons intensely interested in the topic. Recruiting with the assistance of a marketing firm is a possibility depending on the resources available at the time the research goes forward (a marketing firm has been contracted for the companion ICR study in southern Arizona). Since EPA ethics regulations preclude direct payments from EPA personnel to members of the public for their participation, incentive payments are only a possibility when a contractor is used to

assist with recruiting. The exact amount of the incentive payments has not yet been negotiated and will be informed by the contractor's experience and knowledge of the trade. We expect incentive payments to be up to \$75 per participant.

Due to the focus on final ecosystem services there is less burden on the researcher to attempt to describe all of the complexities of the ecosystem within the focus group setting. The intent is to elicit the aspects of the ecosystem that may be of direct importance to the participants. After participants have had a chance to describe their own perspectives, general information will be offered in the course of the focus group about the Willamette River, see the draft script, Appendix 1. Examples of photos that will be used as visual aids are also added as Appendix 2.

Focus group feedback with members of the general public can be used to provide attributes for inclusion in a choice experiment, a stated preference technique for nonmarket valuation. These attributes are similar to what have been referred to as final ecosystem services, or endpoints, in this ICR submission. While this qualitative research may or may not progress to the point of quantitative survey research, the intent is that the qualitative work provide a foundation compatible with such further research. There is a limitation to the cognitive abilities of survey recipients to consider multidimensional tradeoffs thus only a few endpoints can reliably be included in choice experiments (Louviere et al. 2000). There is a trend towards choice experiment methods as compared with contingent valuation methods since more attributes can be valued with a single survey. Further methodological description can be found in Ben-Akiva and Lerman (1985). If numerous endpoints arise consistently within focus groups then a process of winnowing for the top priority variables will occur. Exploration of which specific changes in the resource are important to the public will also be explored. .

Ben-Akiva, M., and S. R. Lerman. 1985. Discrete choice analysis. MIT Press, Cambridge, Massachusetts.

Louviere, J., D. Hensher, and J. Swait. 2000. Stated choice methods: analysis and applications. Cambridge University Press, New York.

5(c) Small Entity Flexibility

As this project has the goal of contacting both members of the general public, as well as organized stakeholder groups, information may be collected from small businesses, small organizations, or small governmental jurisdictions as a result of this information collection. It will be made clear that participation is completely voluntary. To reduce burden on representatives of small entities, conducting individual interviews by phone is a possibility.

5(d) Collection Schedule

Focus groups and interviews will be scheduled very shortly after approval of this ICR. No fixed schedule for this collection has been established.

Section 6. Estimating the Burden and Cost of Collection

6(a through e)

This burden statement includes the burden of focus groups and individual interviews for stakeholder groups and members of the general public. The only burden imposed by the interviews on respondents will be the time required to participate in focus group discussions and answer interview questions. It is estimated that this will require an average of 2.0 hours per respondent (including screening). Nine focus groups with nine participants, and thirty-six individual interviews are expected for a total of 117 respondents and a total of 234 hours.

TABLE 1. - **Average Annual Respondent Burden and Costs**

	Subject	Number of Focus Groups for Study	Average Number of Participants per Group	Number of Individual Cognitive Interviews for Study	Total Number of Individuals Participating in the Study	Avg Hours of Duration for Each Group/Cognitive Interview (includes screening)	Total Estimated "Respondent" Hours
Office of Research and Development	Public Values Related to the Willamette River	9	9	36	117	2.0	234

6(f) Reasons for Change in Burden

This is a new request.

6(g) Burden Statement

Respondent focus group hours are expected to total 234 hours for this study. These hours are expected to be spread over 9 focus groups and 36 individual interviews, although the ratio may vary depending on recruiting.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, D.C. 20503, Attention: Desk Officer for EPA. Include the EPA ICR number and OMB control number in any correspondence.

Part B.

There are no tabulated results for this information collection.

Information gathered from focus groups is qualitative in nature. They allow for a more in-depth understanding of respondents' attitudes, beliefs, motivations, and feelings than do quantitative studies. It serves the narrowly defined need for direct and informal opinion on a specific topic.

Appendix 1: Focus Group Draft Script

Draft 1/03/2011

Background and informed consent

The purpose of this interview is to improve government understanding of public perspectives on rivers and streams in your area. We are interested in talking with people in order to help us prioritize EPA research on the Willamette River, including stream monitoring.

I plan to keep all interview data confidential to the extent permitted by law both in terms of your name and the name of any organization you might be affiliated with unless you prefer otherwise. (Discuss if needed).

I will ask a question and allow you to respond, and I may ask follow-up questions to make sure I understand. There are no right or wrong answers. I just want your thoughts on a few topics. The interview should last no more than one and a half hours.

I am taking notes and recording these interviews so that I don't miss anything, it is so hard to remember everything that happens even in just that short time. Is recording OK with you? And the last thing I need is your consent - do you consent to being interviewed?

Do you have any questions before we begin? OK, let's start.

Warm-up Questions

1. How long have you lived in western Oregon? Have you been in [city/town] that whole time?
Probe for where the respondent has lived if they do not volunteer this (unless they seem uncomfortable divulging this)
2. Would you say that you are familiar with rivers and streams in this area or unfamiliar?
 - Probe – if they have indirect or direct experience, what form has that taken. What “user group” would they potentially fit into, referencing categories in Ringold et al, pg. 22.
 - If unfamiliar, stress that their opinion is especially helpful since this group of persons is hard to reach. Familiarity with a specific resource is not necessary to have general perspectives on the issue, and we want to record these general perspectives every bit as much.

Try to transition by 10 minutes to Q3

Main Questions

3. What are the first things that come to mind when I say “rivers and streams of western Oregon”?
 - If uncertain, mention any thoughts at all, generalities are OK
4. What features of rivers and streams of western Oregon are important to you, if any?
 - If uncertain, note “expert” opinion not needed, generalities are OK
 - For example, imagine that you had your own team of scientists – what would you like them to find out for you about rivers/streams in this area?
 - If response is “best environmental...”
 - Does that mean most natural? Least disturbed?
 - Note most sites are impacted in some way
 - There isn't really one answer, so human desires matter.
 - Which types of sites are most worthy of protection, since there is variety
 - Probe responses for direct personal interest, if any
 - Probe responses for “final” attributes, e.g. if floods mentioned, important by themselves or because of property damage. What can be measured.
 - Remind to consider a range of rivers/streams if one is repeatedly mentioned

5. What are some of the things that come to mind when I say “the Willamette River”?
 - If uncertain, mention any thoughts at all, generalities are OK
6. Are there some things important to you about the Willamette River?
 - If uncertain, note “expert” opinion not needed, generalities are OK
 - Probe responses for items of direct personal interest, if any
 - Probe responses for “final” attributes, e.g. is water clarity important by itself or because of concern for wildlife. What can be measured.

BEFORE Q7 OR DURING EXCHANGE FOLLOWING Q6:

Provide general map of the Willamette River Mainstem and example photos-

Background narrative draft: “The Willamette River Mainstem is considered to run from the confluence with the MacKenzie River in Eugene, OR, to where it meets the Columbia River near Portland, OR. Natural scientists have documented a number of changes in the river relative to 1850, a time when the condition was more or less undisturbed. Today, much of what used to be a broad floodplain with wetlands and forest has been channelized and developed for agricultural and urban use. While this has had environmental costs, changes to the river have made more riverside area available for agricultural and urban purposes. The network of dams in the valley also reduce flood risk and produce electricity. Much of the land along the river is privately owned but there are still some areas of public access. As compared with historic conditions there are fewer species of native fish and wildlife living in or along the river, although some habitat does still exist. The Oregon Dept of Environmental Quality lists three main pollutants: overly high stream temperature, bacteria, and mercury. High stream temperatures affect aquatic life, including native fish. Bacteria make the water unsafe for human recreation involving contact with the water. Mercury makes fish unsafe to eat for people, and animals such as birds-of-prey. There are different levels of these pollutants along the river, but in general pollutants are worse as one travels downstream (north) from Eugene to Portland.”

7. Does hearing this information about the Willamette River and seeing the photos bring any more thoughts to mind?
8. Do you think that the management of the Willamette River and river banks should change in any way?
 - Possible changes include more forest, more recreational access, less bank modification
 - Think big! Imagine your preferred river.
 - Is the method of change important, bulldozers versus ‘leave alone’
9. Do you think it makes sense to change the way dams are operated to improve conditions for endangered salmon, even if it would make the reservoirs lower in summer, and less appealing for recreation? What if changing dam operations to improve conditions for fish made your electricity bill go up 10%?
10. Do you think it would be a good use of public money to purchase riverside property from farmers and convert it into areas to better support fish and wildlife? (if yes) Are there specific species that you are interested in improving?
11. Is there anything else you would like to add?

The Willamette River Mainstem

River Flows North from Eugene to Portland

Map courtesy of Google Maps



The Willamette River Mainstem

