

## CHAPTER 6.0 POLICY DISCUSSION

### 6.1 Description and Analysis of Policy Alternatives for Implementing the Management Program

The Columbia River Management Act includes new policies for managing water in the Columbia River Basin. It establishes a new mandate for Ecology to “aggressively pursue the development of water supplies to benefit both instream and out-of-stream uses.” The new directive requires Ecology to develop new policies and guidelines. Some of the policies established in the Columbia River Management Act need additional definition to facilitate implementation and to resolve potential conflicts with existing policies. Ecology is proposing the policy alternatives presented in this chapter to help define how it would implement the Management Program.

For all policy alternatives, the underlying statutory requirements for Ecology to approve a new water right or change of water right remain the same. Ecology may not approve a new water right or a change of water right if detriment or injury to existing water rights would result (RCW 90.03.290(3) and 90.03.380).

The policy alternatives are outlined in Section 2.2. This chapter contains additional description of the policy alternatives and a discussion of the implications of each of the policy alternatives.

The policy alternatives considered within the proposal are primarily alternatives for how Ecology will process and implement the components of the Management Program. Many of these alternatives would have a limited impact on the natural or built environment. The primary impacts would be related to how water rights would be processed and how funding would be distributed to proposals. Chapters 4 and 5 include discussion of the impacts on the elements of the environment from projects proposed under the Management Program. Therefore, the impacts of policy alternatives on each element of the environment are not being evaluated in this chapter of the programmatic EIS.

#### 6.1.1 Definitions

Based on comments received on the Draft EIS, Ecology has developed the following definition of terms used in the Columbia River Water Management Act:

“**Conservation**” means a reduction in the volume and/or rate of water diversion required to accomplish a beneficial use.

“**No negative impacts**” means no reduction in the flow of the mainstem Columbia River on a weekly basis during a period when flows are inadequate to provide for existing water rights or the preservation of wildlife, fish, scenic, aesthetic, other environmental values, and navigational values.

**“Pool”** means a reach of the Columbia or Snake River mainstem inundated and under the downstream hydraulic control of one of the US Corps of Engineers, Bureau of Reclamation, or mid-Columbia Public Utility District (PUD) dams.

**“Voluntary Regional Agreement”** (VRA) means a contractual agreement between Ecology and a group of water users in a defined geographic area within the Columbia River basin.

### **6.1.2 Selecting Water Supply Projects**

Ecology’s role in state water management has traditionally been one of regulation and permitting. The Columbia River Water Management Act adds to this traditional role by requiring the agency to “aggressively pursue” water supply development. Ecology currently plays some role in water supply development for instream flows and out-of-stream uses, but the legislation has “ramped up” this role by requiring that Ecology take an aggressive role in water supply development. All of the policy alternatives addressing selection of water supply projects presented in this programmatic EIS relate to how aggressively Ecology will pursue projects. This first policy alternative frames the discussion by defining “aggressively.” Two alternatives were proposed:

**Review projects only as proposed by applicants.** Water supply projects would be reviewed only as proposed by applicants, and screened and ranked by criteria developed by Ecology, including cost effectiveness, fisheries benefits, and other criteria.

**Aggressively pursue water supply options.** In addition to reviewing projects proposed by applicants, Ecology would aggressively pursue water supply options (e.g., use watershed plans to identify and pursue smaller storage options; purchase stored water in Idaho and/or Canada; consider buying or negotiating changes in operations of existing federal facilities; conduct studies for ASR or passive ground water recharge; and promote small scale projects that benefit small landowners), including water acquisition and conservation projects.

Under the first alternative, Ecology would review only projects proposed by applicants. Under the second alternative, in addition to receiving proposals, Ecology would “aggressively pursue” water supply projects. The first alternative would not fully meet the goal of “aggressively pursuing” water supply options. Ecology would maintain its existing role as a regulating and permitting agency and would manage the grants and/or loans necessary to distribute and manage the funding. Under the second alternative, Ecology would take a more proactive role in water management by pursuing projects independent of those proposed by applicants. The second alternative would better meet the goals of the Columbia River Water Management Act.

**Preferred Alternative:** Ecology will actively pursue the most cost-effective and beneficial methods to meet the future water supply needs of the Columbia River basin. Both large and small water supply projects will be evaluated and considered. First, Ecology will continue to fund studies designed to identify large off-channel storage projects that would serve multiple water supply purposes and benefit both public and environmental water needs. Second, Ecology will work to identify other, likely smaller, water supply opportunities that might substitute for, or

complement, new large off-channel storage. Opportunities include: using watershed plans to identify and pursue smaller storage projects; purchasing stored water in Idaho and/or Canada; buying or negotiating changes in operations of existing federal facilities to provide additional water when and where it is needed; aquifer storage and recharge; passive ground water recharge; and other water conservation and acquisition projects.

### 6.1.3 Calculating Net Water Savings from Conservation

The Columbia River Management Act provides that net water savings from conservation projects shall be placed in the Trust Water Rights Program (Trust Program): “net water savings achieved through conservation measures funded by the account shall be placed in trust in proportion to the state funding provided to implement the project” (RCW 90.90.010(4)). Integration of the Act with the existing Trust Program results in two central questions—1) what conservation projects can be considered and 2) how will conservation savings be calculated?

First, although the effective date of the Act is July 1, 2006, the Act directs Ecology to manage savings from conservation projects in the Trust Program. There are many ways that water rights can be managed in the Trust Program, including through donation and acquisition. Although statutory differences exist in RCW 90.42 on how trust water savings will be calculated, in general, such savings must be derived from a valid water right and in the case of donation, may be limited to the amount beneficially used within the last five years. In order to maximize conserved water under the Act and fully integrate the Act with the Trust Program, Ecology will consider any conservation project that meets the requirements of the Act and the Trust Program, including projects that were implemented prior to July 1, 2006, but are not currently managed within the Trust Program.

Second, neither the term “net water savings” nor the method for calculating it is defined in the Columbia River Management Act. Ecology considered two alternatives for calculating net water savings.

**Use Guidance-1210 methodology.** Net water savings methodology would be defined by rule, primarily based on existing guidance in Guidance-1210<sup>1</sup> (Ecology 2005), which establishes Ecology’s approach for determining irrigation efficiency and consumptive use of water.

**Develop and use a methodology incorporating scientific evidence on the benefits of the net water savings to instream flows.** Net water savings methodology would be developed based on scientific evidence regarding the benefits to instream flows. The methodology could include any credible approach that addresses the fate, pathway, timing, and legality of the water transfer being proposed.

---

<sup>1</sup> The Guidance 1210 methodology can be obtained on Ecology’s web site at: [www.ecy.wa.gov/programs/wr/rules/images/pdf/pol1210r.pdf](http://www.ecy.wa.gov/programs/wr/rules/images/pdf/pol1210r.pdf)

The term “net water savings” is defined for purposes of the Trust Program:

“Net water savings” means the amount of water that is determined to be conserved and usable within a specified stream reach or reaches for other purposes without impairment or detriment to water rights existing at the time that a water conservation project is undertaken, reducing the ability to deliver water, or reducing the supply of water that otherwise would have been available to other existing water uses (RCW 90.42.020(2)).

A trust water rights statute specific to the Yakima Basin defines the term similarly:

“Net water savings” means the amount of water that through hydrological analysis is determined to be conserved and usable for other purposes without impairing existing water rights, reducing the ability to deliver water, or reducing the supply of water that otherwise would have been available to other water users RCW 90.38.010(2)).

The common factors in the definitions are that the saved water must be available for use for other purposes without impairment to existing water rights, without reducing the ability to deliver water, and without reducing the water supply that would have otherwise been available. These criteria can, under most circumstances, be met by considering as “net water savings” only the portion of the quantity saved that has been consumptively used.

Ecology's Guidance-1210 includes several alternative methods for quantifying the consumptive use portion of a water right using either project specific data or empirical data for similar irrigation situations. It may also be useful to analyze the fate (in addition to the quantity) of deep percolation and other non-consumptive elements of the farm water budget to fully understand the benefits to instream flows. The advantages of the first alternative (rulemaking) include certainty to applicants on how calculations of water savings will occur and parity amongst water users subject to individual project conditions. The advantage of the second alternative (any credible scientific approach) is flexibility in selection of methods for calculating saved water.

Example #1. Adoption of Ecology guidance in rule would likely result in a standardized state methodology for calculating evapotranspiration (ET) consistent with USDA and NRCS standards. Calculation of ET is often the portion of beneficial use under the water right which can be protected instream in the Trust Water Rights Program. Selection of the second alternative would allow any one of more than 50 ET equations to be used to determine saved water.

Example #2. Adoption of Ecology guidance in rule would identify a hierarchy of information that, if available, should be used in calculating water saved by multiple methods. These could include source metering data, power metering records, run-time information, aerial photography review, production records and other sources of information. Selection of the second alternative would allow any credible source of data to be used in calculating conserved water, but would not necessarily rank one methodology over another for any given project.

**Preferred Alternative:** Ecology will use GUID-1210 (a 2005 Ecology guidance document that establishes Ecology's approach for determining irrigation efficiency and consumptive use of water) for calculating net water savings. Ecology may, if required by RCW 34.05, propose a rule that adopts the GUID-1210 methodology as the basis for calculating consumptive use and net water savings.

#### **6.1.4 Funding Criteria for Conservation Projects**

The Columbia River Water Management Act directs Ecology to aggressively pursue the development of water supplies to benefit both instream and out-of-stream uses. The Act specifies that two-thirds of the funding in the Columbia River Water Supply Development Account (Account) be spent on storage projects and establishes a specific standard for spending funds associated with storage projects funded from the Account. Two-thirds of the new water is allocated to out-of-stream use and one-third is allocated to instream flows. The Act does not provide similar policy direction for 1) funding of conservation projects or 2) the criteria by which conservation projects will be screened and ranked.

The Act provides that the remaining one-third of the funds from the Account be "used for other purposes in this section," which includes conservation. Net water savings from conservation are to be placed in the Trust Program, but the Act does not specify how the water in Trust Program is to be used (RCW 90.90.010(2)(b), (4)). Ecology is considering three alternatives for funding and allocating new water that results from conservation projects.

**Funding projects to benefit only out-of-stream water allocation.** Any net water savings derived from funds that Ecology spends for conservation projects would be assigned to mitigate for permits authorizing out-of-stream beneficial use. Net water savings would not benefit instream flows in the Columbia River, but could benefit tributaries depending on the source of conserved water.

**Funding projects to benefit only instream flows and water quality.** Under this allocation proposal, net water savings from funded conservation projects would be used to benefit instream flows and water quality in the Columbia River as well as tributaries, if applicable.

**Funding projects to obtain one-third of the benefit to instream purposes and two-thirds to benefit out-of-stream water allocation.** Net water savings derived from funding conservation projects would be assigned to benefit both instream flows and out-of-stream uses on the Columbia River. One-third of the net water savings would be managed in the Trust Water Rights Program to benefit Columbia River instream flows and two-thirds would be assigned to mitigate for out-of-stream beneficial uses authorized by permits that would be issued under the program.

The Act provides that net water savings achieved through conservation funded by the account will be placed into the Trust Program in proportion to the state funding provided for the project. The Act does not say for what purposes the water placed in the Trust Program may be used. Under the first alternative, the benefit (net water savings) assigned to the Trust Program would be for out-of-stream water allocation, not instream flow. The second alternative would do the

opposite, i.e., all water transferred to the Trust Program from conservation savings would be allocated to achieve instream flow and water quality benefits. Neither alternative appears to be consistent with the findings of the legislature in enacting the Columbia River Water Management Act. The legislature found “a key priority of water resource management in the Columbia River basin is the development of new water supplies that includes storage *and* conservation in order to meet the economic and community development needs of people *and* the instream flow needs of fish” (RCW 90.90.005(1)) (Emphasis added).

Under the third alternative, money would be spent and resulting benefit assigned on a basis other than 1:1 for out-of-stream and instream uses. Assigning two-thirds of the saved water for out-of-stream uses and one-third for instream flow would be consistent with the ratio for storage projects (RCW 90.90.020(1)(a)). However, since the legislature did not expressly provide such a ratio as it did for storage, this decision appears to be within Ecology's discretion.

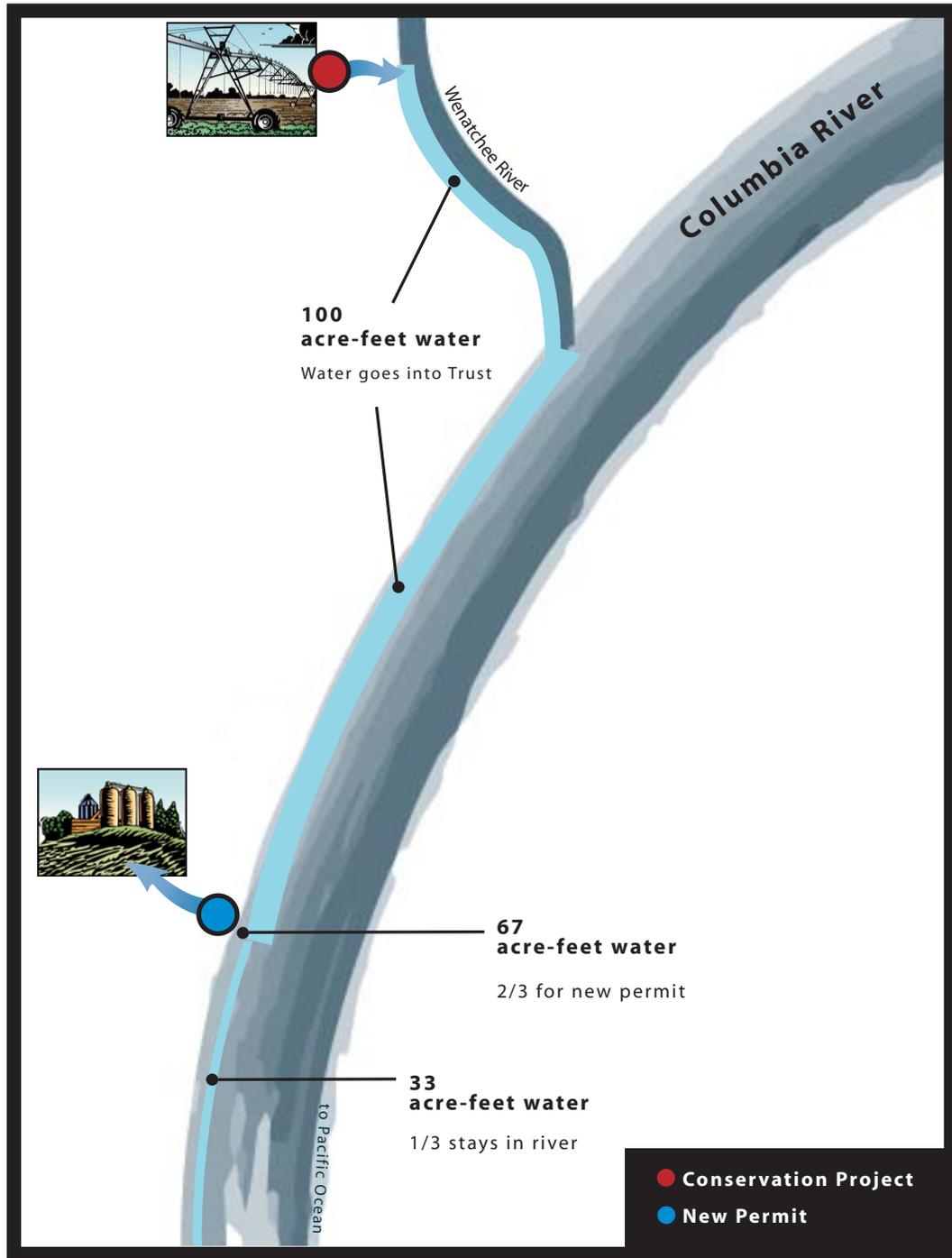
Example #1. Ecology funds a conservation project in the Wenatchee River Basin that results in 100 acre-feet of water being managed in the Trust Program. Under the first alternative, trust water benefit would only occur in the Wenatchee River and the full 100 acre-feet would be used to offset a future appropriation of water from the Columbia River. Under the second alternative, the full 100 acre-feet would benefit both the Wenatchee River and the Columbia River. Under the third alternative, the full 100 acre-feet would benefit the Wenatchee River, 33 acre-feet would benefit the Columbia River and 67 acre-feet would be used to offset a future appropriation of water from the Columbia River (see Figure 6-1).

The Act also does not describe how conservation projects will be screened and ranked for funding. Even before the Act became effective, Ecology began receiving inquiries on whether different projects would be eligible for funding under the program. Through this Programmatic EIS process and with input from Ecology's Columbia River Policy Advisory Group<sup>2</sup> (PAG), Ecology will develop funding criteria and a screening and ranking process. Ecology will also decide whether to include funding criteria in future rule-making efforts or whether guidance will be developed on the funding program. The flowchart in Figure 6-2 illustrates how such a funding program could work.

**Preferred Alternative:** Net water savings derived from funding conservation projects will be assigned to benefit both instream flows and out-of-stream uses on the Columbia River. Projects would be qualified and then ranked by the magnitude and significance of the instream and out-of-stream benefits expected. In-kind contributions and cost-sharing by applicants will be among the criteria to be developed by Ecology.

---

<sup>2</sup> For information on the Columbia River Policy Advisory Group, see Ecology's web page at: [http://www.ecy.wa.gov/programs/wr/cwp/crwpmp\\_info.html](http://www.ecy.wa.gov/programs/wr/cwp/crwpmp_info.html)

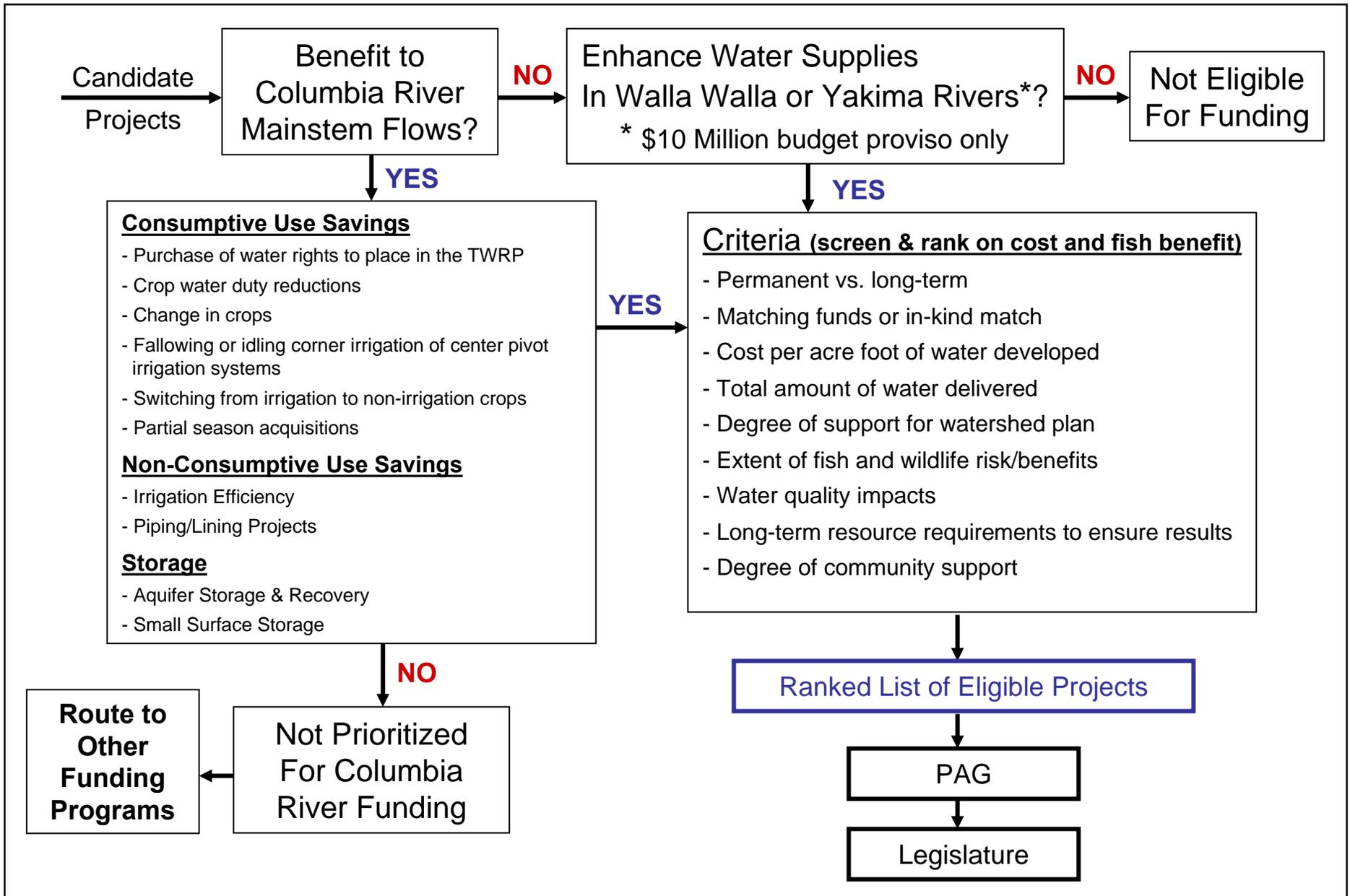


File name: Fig06-1\_colriv.ai  
 Created/last edited by: JAB  
 Date last updated: 02/05/07  
 Reference #: 26068

NOT TO SCALE

Map data are the property of the sources listed below.  
 Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or  
 guarantees regarding any aspect of data depiction.  
 SOURCE:

**FIGURE 6-1**  
 EXAMPLES OF FUNDING CRITERIA APPLICATIONS  
 COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS  
 WASHINGTON



File name: Fig06-2\_Evaluation.ai  
 Created/last edited by: JAB  
 Date last updated: 02/05/07  
 Reference #: 26068

NOT TO SCALE

Map data are the property of the sources listed below. Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction. SOURCE: US Department of Ecology.

**FIGURE 6-2**  
 DRAFT COLUMBIA RIVER PROJECT EVALUATION  
 COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS  
 WASHINGTON

Ecology will ensure the expected project benefits are realized in two ways. First, if conservation projects are funded on tributaries, water savings will be assigned solely to instream flow benefit within the tributary stream down to the confluence with the Columbia River. Second, during initial program implementation, Ecology may reserve a portion of the water rights acquired with Account funds for instream purposes on the mainstem Columbia River. Ecology may subsequently alter the initial reservation once measuring and accounting systems are fully implemented and any uncertainties associated with management of the new trust water rights and new permits are defined and addressed.

To ensure that anticipated out-of-stream benefits are achieved, Ecology will allocate water rights not reserved exclusively for mainstem flow improvement to provide mitigation for new water rights from the Columbia mainstem. Ecology will provide mitigation water for each permit it approves; however, the state-funded portion of the mitigation package will be determined by the project funding criteria and anticipated public benefits associated with the proposed use of water.

### **6.1.5 Defining Acquisition and Transfer**

The Columbia River Water Management Act prohibits Ecology from expending money from the Columbia River Account on conservation projects that will result in “water acquisition or transfers from one water resource inventory area to another” without specific legislative authorization. The bill does not define either acquisition or transfer. Ecology considered two alternative definitions that describe the degree of flexibility that Ecology will have in issuing new water permits from the Columbia River based on projects funded under the program:

**Acquisition and transfer means any non-storage project.** Ecology will interpret “acquisition or transfer” to mean any non-storage project funded in part by conservation monies from the Columbia River Account that results in water put into the Trust Program. Ecology will manage new permits so conserved water from a WRIA is used, where possible, to offset new permits from the Columbia for beneficial uses within that WRIA<sup>3</sup>.

**Acquisition and transfer means direct purchase of water rights.** Ecology will interpret “acquisition or transfer” to mean the direct purchase of water rights, not infrastructure or conservation improvements that may yield conserved water. Ecology will manage new permits so water rights purchased within a WRIA stay within a WRIA.

Example #1. Ecology buys a water right in the Wenatchee River basin. Under both alternatives, this conserved water could only result in a new permit from the Columbia River for beneficial use within that WRIA without specific legislative authorization.

Example #2. Ecology funds a conservation infrastructure project that results in 100 acre-feet of saved water being managed in Ecology’s Trust Program. Under the first

---

<sup>3</sup> Note, some WRIsAs within the Columbia River Basin do not have Columbia River “riverfront” and will not likely receive any new appropriations from the Columbia River itself.

alternative, the 100 acre-feet could only result in a new permit from the Columbia River for beneficial use within that WRIA unless Ecology received specific legislative authorization. Under the second alternative, the 100 acre-feet could result in a new permit from the Columbia River for beneficial uses within other WRIs with no need for specific legislative authorization.

The second alternative provides the greatest flexibility to Ecology in matching supply generated through non-storage projects with future Columbia River demands. However, the second alternative is inconsistent with the ordinary meaning of the term and with the Trust Water Rights statute. The dictionary defines “acquisition” as “the act of acquiring or gaining possession” (Dictionary.com 2006). The Trust Program provides that “[t]he state may acquire all or portions of existing water rights, by purchase, gift, or other appropriate means other than by condemnation, from any person or entity or combination of persons or entities” (RCW 90.42.080). Such acquisitions can be made through “leases, contracts, or such other arrangements with other persons or entities as appropriate, to ensure that trust water rights acquired in accordance with this chapter may be exercised to the fullest possible extent” (RCW 90.42.080). Trust water rights may be acquired by the state on a temporary or permanent basis (RCW 90.42.080.). Once a water right is permanently transferred to the Trust Program, it becomes the state's water right and a certificate to the water is issued in the name of the state (RCW 90.42.040(2)).

If the term “acquisition” is restricted to direct purchase, it eliminates other types of transactions that may result in the state acquiring water, e.g., saved water from conservation projects in the proportion funded by the state. Likewise the term “transfer” as applied to a water right means to change ownership from one person to another or one place to another, i.e., from out-of stream use to instream flow. This can happen through lease, donation, bequest and other means besides direct purchase.

**Preferred Alternative:** For purposes of determining where Account funds may be spent, Ecology will define the terms “acquisition” and “transfer” as follows:

“Acquisition” means funding projects using the Columbia River account for the purpose of effectuating the following forms of consumptive water use reduction:

- Purchase of water rights to place in the Trust Program;
- Crop water duty reductions (e.g., deficit irrigation without crop change);
- Change in crops (e.g., permanent change of orchard to vineyard);
- Fallowing or idling corner irrigation of center-pivot irrigation systems;
- Switching from irrigated to non-irrigated crops; or
- Partial season acquisitions (e.g., foregoing irrigation after first cutting of hay).

“Transfer” means the change of a water right from one place and person to another place and person, or the issuance of a new permit where the consumptive demand associated with the new permit is mitigated by a water right “acquired” using Account funds and held in the Trust Program.

Pumps and pipes infrastructure projects are not considered to be “acquisition” or “transfer.”

### **6.1.6 Conditioning Water Rights on Instream Flows**

The Columbia River Water Management Act states that “Water developed under the provisions of this section to offset out-of-stream uses and for instream flows shall be deemed adequate mitigation for the issuance of new water rights” (RCW 90.90.020(2)). Currently, Ecology conditions new water rights and water right changes to protect instream flows (Chapter 173-563 WAC and Chapter 173-564 WAC). Information on the Instream Flow Rule and the Biological Opinion flows that pertain to the Columbia and Snake Rivers is located in Section 3.3.1 of the Columbia River Water Supply Inventory and Long-Term Water Supply and Demand Forecast, which can be accessed at: [http://www.ecy.wa.gov/programs/wr/cwp/wsi\\_ltsdf.html](http://www.ecy.wa.gov/programs/wr/cwp/wsi_ltsdf.html). The inventory includes tables listing the flows.

The requirement to protect instream flows has discouraged some water right changes that could provide a “new source of water” for municipal users. Ecology considered two alternatives for processing water rights changes:

**Apply instream flow water right created by the June 24, 1980 Columbia River Instream Flow Rule to new permits or changes of season of use that authorize use outside the season where the conserved water or acquired water right was beneficially used.** All changes of seasonal to year-round rights would continue to be subject to the adopted instream flows. Also, new permits that rely on a seasonal water right for mitigation, but which authorize a new use outside the season of use of the water right acquired for mitigation, would be subject to the adopted instream flow during the period outside the time when the mitigation water right was historically exercised.

**Waive instream flow water right created by the June 24, 1980 Columbia River Instream Flow Rule where new permits or transfers shift consumptive demand away from critical periods and benefit aquatic species.** Under this alternative, Ecology would develop an approach that would recognize the benefit to aquatic species of shifting the demand from the critical July and August period to the period from October through March. This approach would include an evaluation of the public benefits and costs and whether the overriding considerations of the public interest (OCPI) would be served by shifting the out-of-stream uses away from a critical period for fish. An example of this approach would be the conversion of a seasonal irrigation use to a year-round municipal use that would reduce actual water use during July and August for the mainstem Columbia River or the April to August period for the Snake River. If the municipal use would be less during July and August than the amount currently used for irrigation during that period, it would benefit instream flow in the same manner as a scheduled release of water from a storage facility. This determination could either be implemented on a case-by-case basis when rights are proposed for change (or mitigation is evaluated for adequacy to issue a new permit) or it could be addressed through rulemaking.

The first alternative relies on conditioning applications for change and new applications to protect the June 24, 1980 adopted instream flow, which is a water right, entitled to protection from impairment (see RCW 90.03.345). Only water right changes that expand the season of use or new permits authorizing a season of use that is not mitigated by the net water savings acquired through mitigation would be subject to the adopted flows. Also, only that portion of the season for which the historic beneficial use did not provide “in-time” mitigation would be subject to the adopted instream flow.

WAC 173-563-080 allows the Director of Ecology to authorize the “use of water which would conflict with the adopted instream flows when it is clear that overriding considerations of the public interest (OCPI) will be served.” Withdrawals of water which would conflict with needed base flows are permitted only “where it is clear that overriding considerations of the public interest will be served” (RCW 90.54.020(3)(a)). Thus, under the existing 1998 Instream Flow Rule, a change of water right from seasonal to year-round, or a new permit with associated mitigation that did not perfectly match the season of use authorized by the new permit, could be approved without subjecting the change to instream flows in the rule. Such a decision could be made on a case-by-case basis, require evaluation in consultation with state and federal agencies and tribes, or could be made by a determination of OCPI by the Director of Ecology in consultation with other state agency directors and the Commissioner of Public Lands.

The real difference between the second alternative and case-by-case consideration is that Ecology would establish through rulemaking that seasonal water rights may be changed to year-round water rights without being subjected to the instream flows set by rule. Currently the Director may make case-by-case determinations of OCPI. Under the second alternative, the determination of OCPI would be made one time during rulemaking and that decision would apply to a class of applications that meet the criteria identified in the rule.

Currently, transfers of season of use (e.g., from irrigation to municipal) are problematic because the resulting seasonal interruptibility makes it difficult for municipalities to provide reliable service for a public water system. In some cases this has led to a proliferation of exempt uses under RCW 90.44.050, rather than transfer of existing rights. The advantage of the second alternative is that it would encourage regional water systems and will help adjust the hydrograph to avoid or lessen impacts during initial demand periods.

No matter which alternative is adopted, the underlying statutory requirements for Ecology to approve a change of water right remain. Ecology may not approve such a change if there are any adverse impacts to existing water rights (RCW 90.03.380).

**Preferred Alternative:** Ecology will continue to apply the instream flow water right created by the 1980 Columbia River Instream Flow Rule to new permits and to season of use changes that authorize a beneficial use during a different season than the mitigation water right. In situations where demand shifting from critical summer months to less critical winter months would result in a benefit to aquatic species, Ecology will consider case-specific waivers of the 1980 instream flow after consulting with the Directors of the Department of Fish and Wildlife and the Department of Agriculture and the Commissioner of Public Lands.

### 6.1.7 Initiating Voluntary Regional Agreements

The alternatives considered here relate to how aggressively Ecology will pursue VRAs. Two alternatives were proposed:

**Process VRAs as proposed.** Ecology would be review VRAs only as proposed by applicants.

**Aggressively pursue VRAs.** In addition to reviewing VRAs proposed by applicants, Ecology would aggressively pursue new water and actively seek groups who wish to develop VRAs through such strategies such as water marketing and reverse auctions (a reverse auction occurs when Ecology notifies water rights holders that it is looking for water to buy or lease and asks those interested to respond to Ecology and let the agency know how much water they are willing to sell or lease and at what price).

The second alternative would better meet the goal of the Columbia River Water Management Act of “aggressively pursuing” the development of water supplies. Processing VRAs as proposed would maintain Ecology’s traditional role of regulating and permitting.

**Preferred Alternative:** Ecology will support water users with common interests to consider a VRA where it benefits the Columbia River Management Program and is in the public interest. Ecology will respond to and work with proponents to execute new VRA proposals that are consistent with RCW 90.90.030. However, this will not be a major focus of Ecology’s activities.

### 6.1.8 Processing Voluntary Regional Agreements

Ecology currently processes water right applications according to the “Hillis Rule” (Chapter 173-152-050 WAC). Generally, Ecology will process new water right applications and water right change applications in two separate tracks in the order they are received within a region. Ecology may make decisions from multiple water sources within a region based on the oldest priority date in each source. Ecology generally prioritizes its work by source (WRIA) for efficiency in investigation and permitting. The oldest priority date is based on the date the application is filed with Ecology (WAC 173-152-030).

The Hillis Rule provides that certain applications may be processed ahead of competing applications, which the rule defines as “all existing applications for water right from the same water source, whether for a new water right or for a change or transfer of an existing water right” (WAC 173-152-020(4)).

“Same water source” or “source of water” means an aquifer or surface water body, including a stream, stream system, lake, or reservoir and any spring water or underground water that is part of or tributary to the surface water body or aquifer, that the department determines to be an independent water body for the purposes of water right administration (WAC 173-152-020(5)).

The legislature established two tracks or lines for processing water right applications, one for applications for new water rights and a second for applications to change an existing water right

(RCW 90.03.380(5)). Thus, applications for new water only “compete” with other applications for new water, not with applications to change an existing right. The same is true for change applications—they are in competition only with other change applications.

Under the Hillis Rule, an application for a new water right or a water right change “may be processed prior to competing applications if the application resolves or alleviates a public health or safety emergency caused by a failing public water supply system currently providing potable water to existing users” (WAC 173-152-050(1)).

An application for a new water right may also be processed out of order if Ecology determines that “immediate action is necessary for preservation of public health or safety; or ...the proposed water use is nonconsumptive<sup>4</sup> and if approved would substantially enhance or protect the quality of the natural environment” (WAC 173-152-050(2)).

An application to change an existing water right may also be processed prior to competing applications if one or more of the following criteria are met: “[t]he change or transfer if approved would substantially enhance the quality of the natural environment; or ...[t]he change or transfer if approved would result in providing public water supplies to meet general needs of the public for regional areas;” and/or “[t]he change or transfer was filed by water right holders participating in an adjudication” (WAC 173-152-050(3)).

The Hillis Rule also provides that each regional office of Ecology shall process applications satisfying the criteria in the rule in the following order:

- a. Health and safety emergencies as defined in WAC 173-152-050(1)
- b. Immediate action is necessary for preservation of public health or safety (WAC 173-152-050 (2)(a)),
- c. Transfers or changes that would substantially enhance the quality of the natural environment (WAC 173-152-050)(3)(a),
- d. Transfers or changes that would result in providing public water supplies to meet general needs of the public for regional areas (WAC 173-152-050(3)(b)),
- e. Transfers or changes filed by water right holders participating in an adjudication and a decision is needed expeditiously to ensure that orders or decrees of the superior court will be representative of the current water use situation (WAC 173-152-050)(3)(c)), and

---

<sup>4</sup> Ecology has adopted a policy (POL 1021) interpreting priority processing of nonconsumptive projects under the Hillis Rule to include those that are “water budget neutral” when considering the withdrawals and mitigation (<http://www.ecy.wa.gov/programs/wr/rules/images/pdf/pol1021.pdf>).

- f. Nonconsumptive uses that would substantially enhance or protect the quality of the natural environment (WAC 173-152-050(4)).

RCW 90.90.030 authorizes Ecology to “enter into voluntary regional agreements for the purposes of providing new water for out-of-stream use, streamlining the application process, and protecting instream flow.” New water can be obtained from a new water right or the change of an existing right. Ecology has identified three alternatives for processing applications for new water rights and water right changes associated with VRAs.

**Process applications according to the Hillis Rule.** Ecology would continue to process new water rights applications according to the Hillis Rule. In order for an application associated with a VRA to be processed ahead of prior competing applications, it would have to meet one of the exceptions in the Hillis Rule.

**Example #1.** An applicant has proposed a new 1—acre-foot irrigation project and is currently fifth oldest in line in priority relative to other competing Columbia River applications. The application is associated with a VRA. Fifty acre-feet of this withdrawal will occur in July and August. Under the first alternative, the applicant under a VRA would have to wait until the four senior applications were processed and then would be required to mitigate for July and August instream flow impacts. Alternatively, the applicant could seek priority processing under the Hillis Rule by also mitigating for instream flow impacts outside the July and August period (e.g., water budget neutral) provided such mitigation also provided substantial environmental benefit. Because the mitigation standard for priority processing is a much higher standard under current regulations than for normal processing, this alternative gives weight to the existing priority system and senior applicants. Cost reimbursement under RCW 90.03.265 may also be an option for some applicants. Priority processing under the Hillis Rule and cost reimbursements are also available to applicants not part of a VRA.

**Amend the Hillis Rule for VRAs that convert interruptible rights.** The Hillis Rule would be amended to add a new processing line for water right applications submitted under VRAs that are solely for the conversion of interruptible rights to non-interruptible rights.

**Amend the Hillis Rule for new water rights from VRAs.** The Hillis Rule would be amended to add a new processing line for issuing new water rights resulting from VRAs.

Any alternative must be consistent with RCW 90.90.030(7) and (8).

(7) Nothing in this section may be interpreted or administered in a manner that precludes the processing of water right applications under chapter 90.03 or 90.44 RCW that are not included in a voluntary regional agreement.

(8) Nothing in this section may be interpreted or administered in a manner that impairs or diminishes a valid water right.

For non-VRA applicants, RCW 90.90.030(7) makes it clear that the current consultation pathway for the Columbia River that Ecology adopted in rule still exists. Absent priority processing, Ecology would apply the appropriate standard (e.g., either consultation or VRA) to each applicant in turn according to priority.

If the first alternative is selected as the preferred alternative, processing of such applications may be delayed and may affect the decision on the applications. The question is whether any of the alternatives would impair or diminish a “valid water right or a habitat conservation plan approved for purposes of compliance with the federal endangered species act” (RCW 90.90.030(8)). Ecology may not grant a new water right if it would impair an existing right. For purposes of new water rights, pending water right applications are considered in such an impairment analysis. If a new water right under a VRA was processed and issued prior to another pending application, it could result in an impairment. However, if the project were “water budget neutral,” then it is unlikely such impairment would occur. Further, if the mitigation water for a new water right is created through a VRA prior to the application for a new water right being filed and processed, there should be no impact from the third alternative. In contrast to new water right applications, in making decisions on change applications, Ecology is not required to consider pending water right applications in its impairment analysis. Therefore, if a change application to convert an interruptible water right to a non-interruptible right is processed prior to non-VRA change applications, it should not result in an impairment of other water rights simply because it is processed first.

**Preferred Alternative:** Ecology currently processes water rights applications according to the “Hillis Rule” (Chapter 173-152-050 WAC). Ecology will continue this practice for new Columbia River applications, including those associated with a VRA. This means that, generally, Ecology will process new water right applications and water right change applications in two separate lines in the order they are received within an Ecology region. Ecology may make decisions from multiple water sources within a Region, beginning with the application with oldest priority date from each source. Ecology generally prioritizes its work by source (WRIA) for efficiency in investigation and permitting. The priority date is based on the date an application is filed with Ecology (WAC 173-152-030).

### **6.1.9 Defining “No Negative Impact” to Instream Flows of the Columbia and Snake Rivers**

The Columbia River Water Management Act sets forth that there shall be no negative impact to stream flow allowed in July and August on the Columbia River and from April through August on the Snake River as a result of a VRA. VRAs could propose withdrawals of water in one part of the basin, based on net water savings through conservation in another part of the basin. There is no existing policy on how or where to measure whether a withdrawal of water pursuant to a VRA would result in a net reduction in stream flow. (The Management Program could include any project that would benefit instream flows in the Columbia and Snake Rivers, which would include some projects on tributaries of these rivers. The location where net water savings from a tributary project would be measured would be at the mouth of the tributary.)

Ecology considered four alternative policies to address measuring a net reduction in instream flow. For each of these alternatives, if a VRA includes a conservation project funded by Ecology, there may be an additional restriction that the mitigation must be in the same WRIA as the new withdrawal (for example see RCW 90.90.010(2)(a) and Section 6.1.3).

**Same pool and downstream.** Withdrawals can occur anywhere downstream of, or anywhere in, the same pool where net water savings through conservation occur, including in tributaries (Figure 6-3a).

**Same major reach.** Withdrawals can occur anywhere within the same major reach, but not downstream of the major reach in which the net water savings through conservation occur (Figure 6-3a).

**Same pool, but not downstream.** Withdrawals can occur anywhere within the same pool where net water savings through conservation occur, but not downstream of the pool (Figure 6-3b).

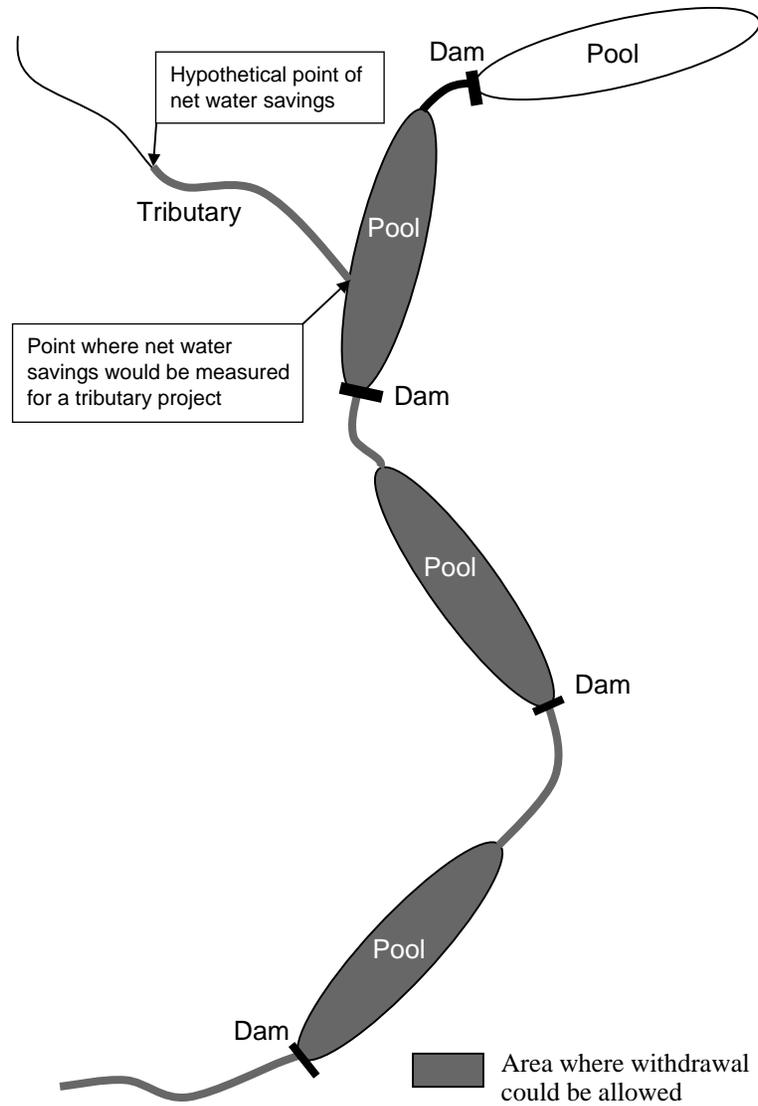
**Same pool, but only downstream of point of net water savings.** Withdrawals can occur within the same pool where net water savings through conservation occur, but only downstream of the point where net water savings through conservation occur, and not downstream of the pool (Figure 6-3b).

The basis of the four alternatives for defining no net impact to instream flow is the relative location of the net water savings and the point of withdrawal under the new water right. Logically, the area of consideration for impact should be aligned with the management units for instream flow in WAC 173-563-040(1)--John Day Dam downstream to Bonneville Dam; measured at The Dalles Dam; John Day Dam upstream to McNary Dam measured at John Day Dam; McNary Dam upstream to Priest Rapids Dam measured at McNary Dam; and Priest Rapids Dam upstream to the Canadian Border measured at Priest Rapids Dam and upstream at Wanapum, Rock Island, Rocky Reach, Wells, Chief Joseph, and Grand Coulee Dams.

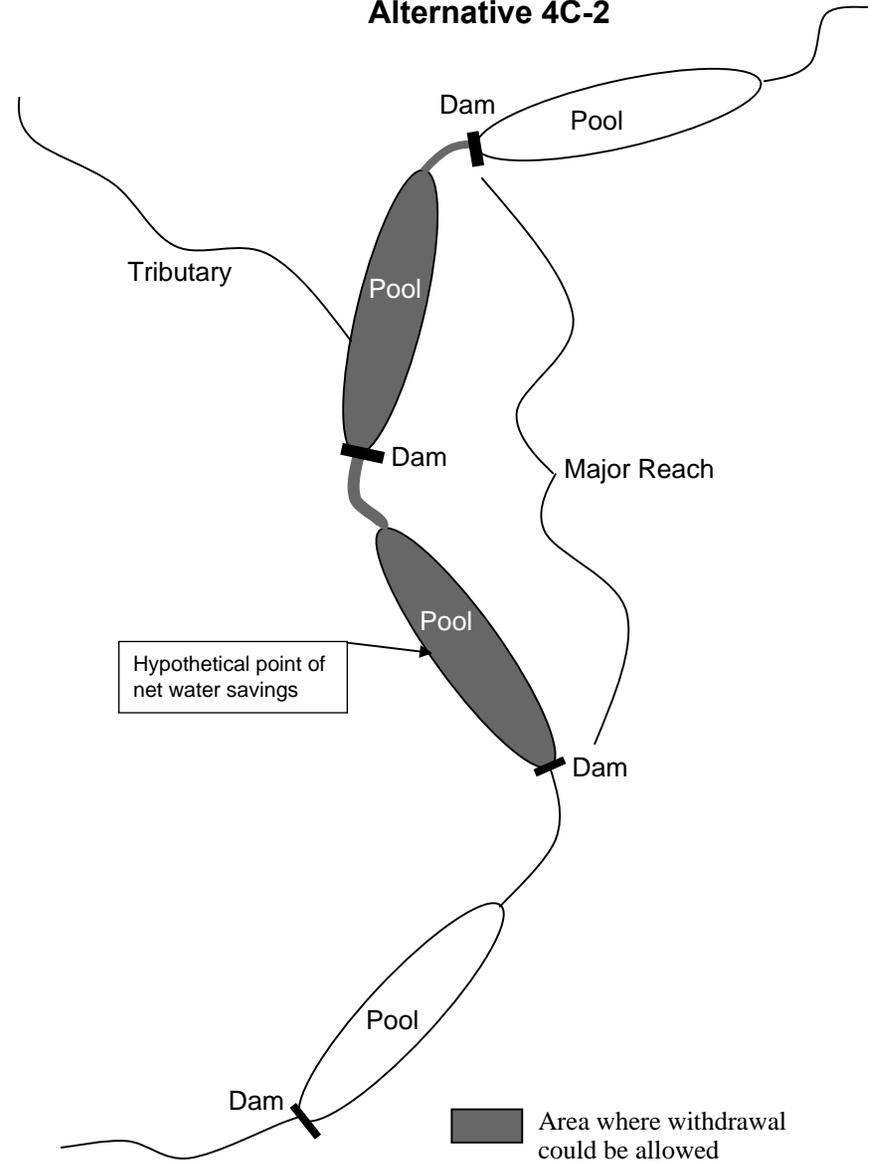
The second and third alternatives are most consistent with the management units established in WAC 173-563. Following the scheme laid out in the rule, as long as any impact from the withdrawal no longer existed at the control point for a management unit, there should be by definition “no net impact” to the river.

Definition of the “major reach” for use in determinations of “no net impact” will affect the “portability” of any credit associated with net water savings (mitigation credits) that can be used to offset the stream flow impacts of new permits. Limiting the use of mitigation credits to a single pool as opposed to within one of four stream reaches would generally lessen the number of prospective water users who could benefit from a credit. It would also reduce the distance that a mitigation credit could be assigned to a new permit to divert water upstream of the site of the mitigation credit. As a result, there would be fewer river reaches created that would have reduced stream flow that might negatively impact fisheries or other elements of the built or natural environment. Restricting the assignment of mitigation credit to new withdrawals at downstream locations only would eliminate the potential for reaches with reduced flow and associated environmental impacts. By limiting the potential location of water conservation and water right acquisitions for mitigating new permits, the costs to the public and prospective water users can reasonably be expected to be higher because the universe of potentially mitigating rights or conservation projects would be smaller.

**Alternative 4C-1**



**Alternative 4C-2**



File name: Fig06-3A\_Alternatives.ai  
 Created/last edited by: JAB  
 Date last updated: 02/05/07  
 Reference #: 26068

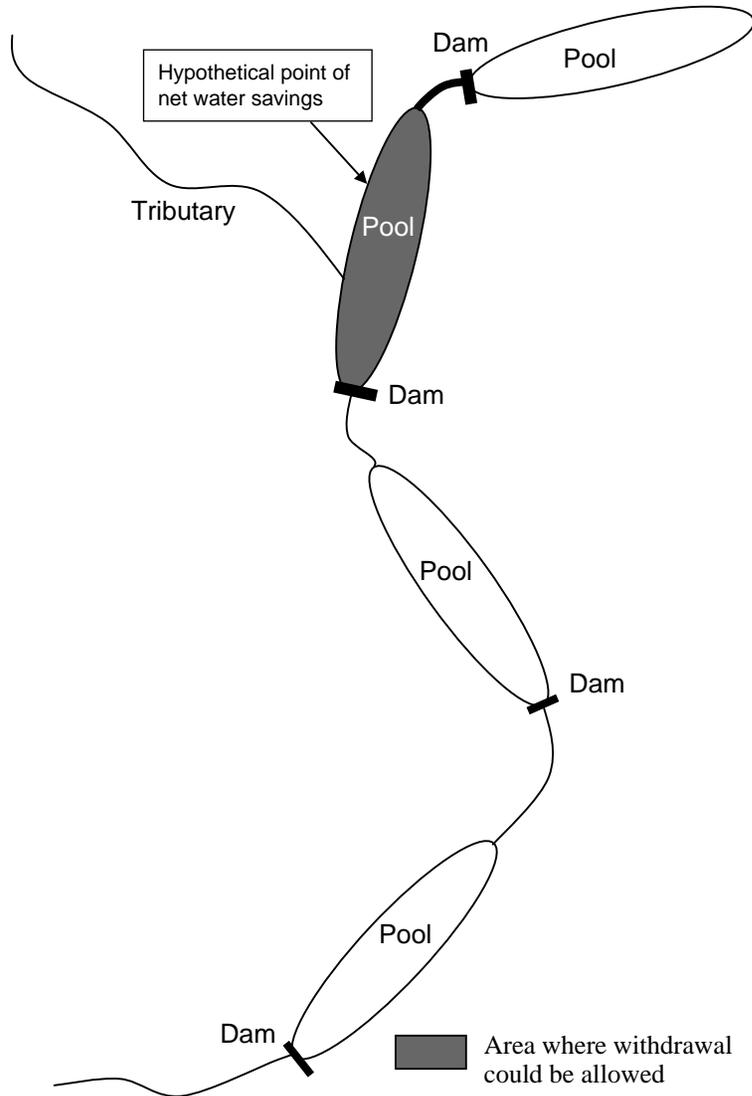


NOT TO SCALE

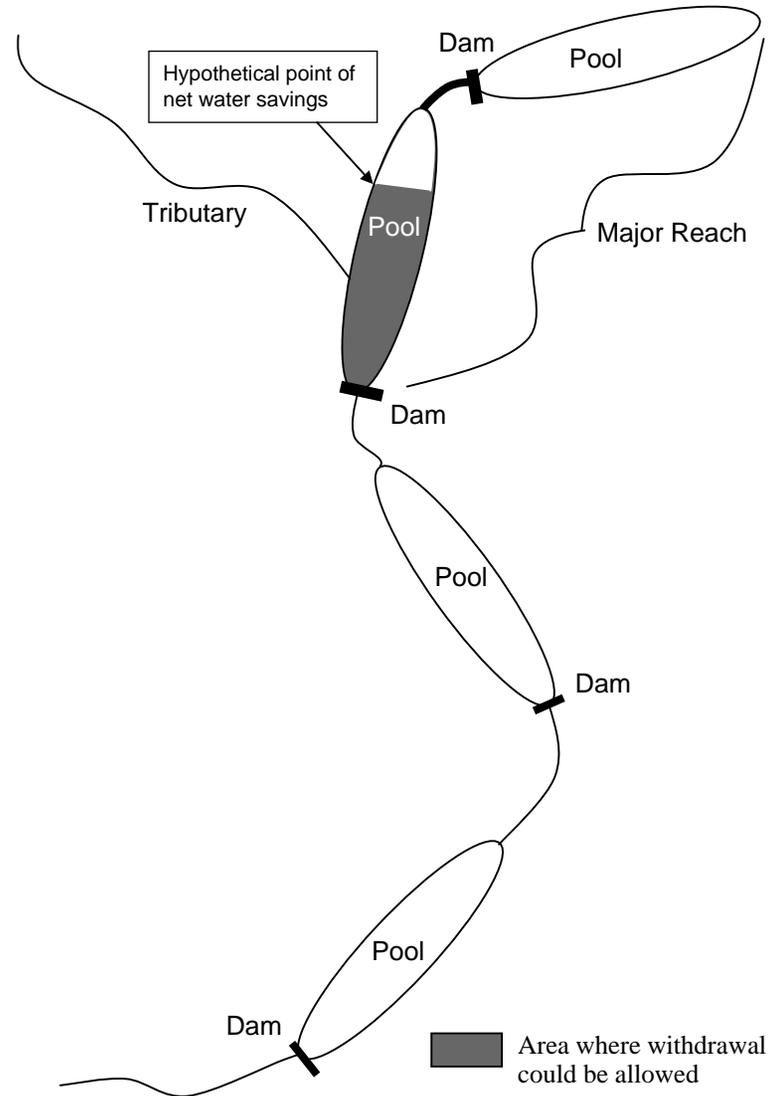
Map data are the property of the sources listed below. Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or guarantees regarding any aspect of data depiction.  
 SOURCE: US Department of Ecology.

**FIGURE 6-3A**  
 ALTERNATIVES FOR MEASURING A NET REDUCTION IN STREAM FLOW  
 COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS  
 WASHINGTON

**Alternative 4C-3**



**Alternative 4C-4**



File name: Fig06-3B\_Alternatives.ai  
 Created/last edited by: JAB  
 Date last updated: 02/05/07  
 Reference #: 26068

NOT TO SCALE

Map data are the property of the sources listed below.  
 Inaccuracies may exist, and Adolfson Associates, Inc. implies no warranties or  
 guarantees regarding any aspect of data depiction.  
 SOURCE: US Department of Ecology.

**FIGURE 6-3B**  
 ALTERNATIVES FOR MEASURING A NET REDUCTION IN STREAM FLOW  
 COLUMBIA RIVER WATER MANAGEMENT PROGRAM EIS  
 WASHINGTON

**Preferred Alternative:** The Columbia River Water Management Act sets forth that there shall be no negative impact to stream flow allowed in July and August on the Columbia River and from April through August on the Snake River as a result of a VRA. Ecology will use metering, monitoring, stream gaging, and water masters to account for trust water rights derived from conservation and acquisitions together with all mitigated permits. Ecology will authorize new out-of-stream uses only within the first mainstem pool that benefits from a trust water right and any downstream pools, subject to the limitations of RCW 90.90.010(2)(a) on acquisitions and transfers. Net water savings from a tributary project would be measured at the mouth of the tributary.

### 6.1.10 Defining the Main Channel and One-Mile Zone

The legislation defines the mainstems of the Columbia and Snake Rivers to include “all water . . . within the ordinary high water mark [OHWM] of the main channel...” and “all ground water within one mile of the ordinary high water mark.” Ecology interprets “all water” in these definitions to refer to diversions within the one-mile corridor, whereas the place of use could be outside of the one-mile corridor. Significantly, this definition applies only to RCW 90.90.030 and RCW 90.90.050, which address VRAs and the water resource inventories.

The definition applies to:

- a. Water rights issued from the mainstem;
- b. No negative impact on instream flows of the mainstem; and
- c. Water resource inventory for “effective mainstem water resource planning and management.”

Ecology considered how to define the OHWM of the main channel and how to measure the one-mile zone. If a narrow definition were used, the program would focus on a smaller number of users. Many water users with interruptible water rights would not be included because they divert water outside of the one-mile corridor and thus might not be eligible to benefit from VRAs or storage projects. Further, there are springs and creeks tributary to the mainstems within the one-mile corridor that could be considered “all water”. Ecology considered two alternatives for defining the main channel OHWM and one-mile zone.

**No backwater areas included.** The definition of the main channel OHWM would not include any of the backwater areas on tributaries. A straight line would be drawn across the mouth of each tributary to delineate the mainstem channel. The main channel also would not include any tributary surface water rights within the one-mile corridor.

**Backwater areas included.** The definition of the main channel OHWM would include backwater areas on tributaries and tributary surface water and thus the one-mile zone would extend one mile from the OHWM of any of the backwater areas as well as from the mainstem proper.

The second alternative would include the backwater areas and the one-mile zone for ground water would be larger. This alternative is more consistent with the definition Ecology has used

in making water right decisions under WAC 173-563. WAC 173-563-020(1) applies to the following:

... public surface waters of the main stem Columbia River in Washington State and to any ground water the withdrawal of which is determined by the department of ecology to have a significant and direct impact on the surface waters of the main stem Columbia River. The extent of the “main stem” Columbia River shall be the Columbia River from the upstream extent of tidal influence (Bonneville Dam River Mile 146.1) upstream to the United States-Canadian border (River Mile 745) and *including those areas inundated by impounded waters at full pool elevations.* (Emphasis added).

The Snake River rule “applies to public waters of the main stem of the Snake River in Washington and to any ground water where the ground water is determined by the department of ecology to be part of or tributary to the surface waters of the main stem of the Snake River” (WAC 173-564-030(1)).

The first alternative would exclude a portion of this water, namely that backed up into tributary areas. In doing so, it would exclude certain water rights issued since 1980 and subject to WAC 173-563 minimum flows from participation in this program. The second alternative is more consistent with Ecology's practice under the existing rule. Finally, the second alternative provides a larger inventory of water rights, and could improve Ecology's ability to plan for and manage the Columbia River water resources.

**Preferred Alternative:** The Columbia River Water Management Act defines the mainstems of the Columbia and Snake Rivers to include “all water ... within the ordinary high water mark (OHWM) of the main channel...” and “all ground water within one mile of the ordinary high water mark.” Ecology interprets “all water” in these definitions to refer to diversions within the one-mile corridor, even where the place of use of the diverted water is outside of the one-mile corridor. The definition of the main channel and one-mile zone applies to:

- a. Water right permits issued from the mainstem;
- b. The mitigation standard for VRAs (no negative impact on instream flows of the mainstems); and
- c. The water resource inventory prepared for “effective mainstem water resource planning and management.”

A straight line will be drawn across the mouth of each tributary to delineate the mainstem channel. The main channel OHWM does not include any of the backwater areas on tributaries nor does it include tributary surface water rights within the one-mile corridor.

### **6.1.11 Coordinating VRA Mitigation and Processing New Water Rights**

Processing new water rights from the Columbia River will require mitigation for any impacts to instream flows. The mitigation will be provided either through a VRA or through the consultation process (WAC 173-563-020, see Section 1.3 for additional information). A VRA

requires no negative impact on instream flows in July and August (April through August for the Snake River). Mitigation under a VRA means avoidance of impacts on flows and is in kind, in time, and in place.

Ecology plans to aggressively pursue funding of storage and conservation projects to make mitigation water available for such permits. However, adequate mitigation water may not be available for new water rights associated with a VRA. RCW 90.03.380(5)(c) allows Ecology to skip over a water rights change application to the next person in line if information is lacking to make a decision on the request. There has been some concern that Ecology does not have similar statutory discretion for processing new water rights and must process them in the order they are received. However, it now seems clear that Ecology may request permission from the applicant to be skipped over if the senior applicant has not provided enough information on the application.

Ecology considered two alternatives for processing applications if adequate mitigation water has not been acquired in the area needed to make a permit decision.

**Deny the application.** If mitigation water is not available to meet the requirements in the legislation, Ecology should deny the decision or otherwise require the applicant to provide adequate mitigation in a timely manner (to meet the VRA standard or that imposed by Ecology following consultation). If the application is denied and mitigation later becomes available in that area, the applicant would have to refile an application and the mitigation water would be used for the oldest application in line in that area.

**Seek legislative authority to skip applications.** Ecology should seek legislative authority similar to that provided in the change statute (RCW 90.03.380(5)(c)) so it can skip over VRA applications upon request of the applicant where mitigation is not available. If mitigation later becomes available, the senior-most applicant in that area would be able to use the mitigation for their project subject to the terms and conditions of Ecology's acquisition of the mitigation.

In large part, the effect of these alternatives on any pending application depends on whether the Hillis Rule (WAC 173-152) is amended by Ecology to create a separate line for new water right applications associated with a VRA (see Section 6.1.8). If VRA applications are in a separate line, it seems logical that Ecology would not process the applications until the mitigation water is in place. In the alternative, Ecology could process applications and issue permits subject to instream flow conditions that would be removed as mitigation meeting the mitigation standard is accepted. A phased authorization, like the 1993 Quad-Cities permit, may provide a reasonable model for balancing infrastructure planning, financing, and acquisition of mitigation water.

Conflicts would likely arise over Ecology's schedule for acting on pending applications when a pool of mitigation water is not available to mitigate for all of the pending applicants' needs. If a non-VRA applicant deep in the line of applications acquired its own mitigation and Ecology agreed to process its application, but the VRA applicant earlier in line did not have mitigation available, then the VRA application would be denied unless the senior applicant agreed to allow the junior application to be processed first. The reverse situation may be as likely to occur. Absent a decision to deny applications without acceptable mitigation, any other application that

provided its own mitigation water would be delayed significantly while the consultation process under WAC 173-563-020(4) was performed. Alternatively, Ecology could choose not to process any applications in that area until mitigation water is available for all applicants in the entire area.

**Preferred Alternative:** Processing new water rights from the Columbia River will require mitigation for any impacts to instream flows. The mitigation will be provided either through a VRA or through the consultation process (WAC 173-563-020, see Section 1.3 for additional information). The mitigation standard for Columbia River water rights covered by a VRA is no negative impact on instream flows during July and August. For the Snake River, it is no negative impact for the months of April through August. Mitigation under a VRA means avoidance of negative impacts on flows and must be in-kind, in-time, and in-place.

Ecology will aggressively pursue funding of water supply projects to make mitigation water available for new mainstem permits, whether covered by a VRA or not. However, in some cases, adequate (in-kind, in-time, in-place) mitigation water may not be available. RCW 90.03.380(5)(c) allows Ecology to skip over a water right change application to the next person in line if information is lacking to make a decision on the request. There has been some concern that Ecology does not have similar statutory discretion for processing new water rights and must process them in the order they are received. However it now seems clear that Ecology may request permission from the senior applicant to be skipped over if the senior applicant has not provided enough information on the application.

If state-funded mitigation is unavailable and those earlier in line that require mitigation cannot provide their own, Ecology would allow those earlier in line to voluntarily step aside for up a set period of time. After that period of time, the application would be processed, even if adequate mitigation water has not been found. This may result in a denial of an application to the extent that mitigation was inadequate. If an earlier applicant declines to step aside, Ecology will process the application and would deny an application that fails to meet the four-part test under RCW 90.03.290. Ecology will address this process through policy development or, if required by RCW 34.05, rulemaking and will consider reasonable timeframes (e.g., two years) necessary to coordinate acquisition of adequate mitigation under the program (in-kind, in-place, in-time) with new application requests. .

### **6.1.12 Coordinating VRA and Non-VRA Processing**

WAC 173-152-030 states that Ecology will process new water right applications in the order they are received within a region. It also allows Ecology to make decisions from multiple water sources within a region, based on the oldest priority date in each source (Ecology defines “source” as the same body of public water that is not hydraulically connected). The oldest priority date is based on the date of the application filed with Ecology. Generally, Ecology processes water rights applications on a WRIA by WRIA basis within the region to maximize permitting efficiency, which may include Columbia River applicants and non-Columbia River applicants. The Columbia River spans multiple WRIsAs and three Ecology regions (Southwest, Central and Eastern). How Ecology chooses to prioritize its work will affect the seniority of applicants who will be processed under the Management Program, where Ecology should

prioritize its conservation efforts to generate mitigation water through acquisitions and conservation project funding, and where applications will be eligible to receive mitigation water from projects funded with Columbia River dollars. Ecology considered three alternatives for processing VRA and non-VRA applications:

**Grouped within the Columbia River one-mile corridor.** Ecology would group all applicants in the Columbia River one-mile corridor together, giving maximum weight to the existing priority system.

**Grouped within the Columbia River one-mile corridor by region.** Ecology would group all applicants in the Columbia River one-mile corridor by region and direct staff to work on the first applicant in each region at the same time. This would provide regional parity by processing water rights in each region. Water rights in one region would not be processed to the exclusion of another region.

**Grouped within the Columbia River one-mile corridor with WRIA permitting.** Ecology would group all applicants in the Columbia River one-mile corridor with tributary WRIA permitting, which integrates permitting at the WRIA level. Ecology would choose which WRIA to work in based on the existence of mitigation water available to offset Columbia River impacts.

In assessing these alternatives it is important to consider another section of the Hillis Rule that establishes how Ecology is to organize and manage its water rights workload. WAC 173-152-030 provides in part as follows:

The department will make decisions on new water right applications and applications for change or transfer of an existing water right within a region or within a regional or field office's geographic area in the order the application was received except as provided for in subsection (3) of this section and WAC 173-152-050.

The second and third alternatives appear to be most consistent with this rule.

The department may, based on the criteria identified in subsection (4) of this section, conduct an investigation and make decisions on one or more water right applications for the use of water from the same water source. Within a regional office, more than one water source may be investigated at a time. When numerous applications for water from the same water source are being investigated, the decisions will be made in the order in which the applications were received. Each application will be considered individually under the requirements of Chapters 90.03 and 90.44 RCW.

Criteria for selecting a water source include, but are not limited to:

- a. The number and age of pending applications, and the quantities of water requested;

- b. The ability to efficiently investigate applications because of the availability of data related to water supply and future needs, streamflow needs for instream values, and hydrogeology of the basin;
- c. The ability of the department to support implementation of local land use plans or implementation of water resource plans;
- d. The projected population and economic growth in the area; and/or
- e. The completion of an initial basin assessment as provided for in WAC 173-152-040(5).

The first alternative appears most consistent with the definition of same source and processing applications from the same source at the same time.

“Same water source” or “source of water” means an aquifer or surface water body, including a stream, stream system, lake, or reservoir and any spring water or underground water that is part of or tributary to the surface water body or aquifer, that the department determines to be an independent water body for the purposes of water right administration (WAC 173-152-020(5)).

When considering whether a new water right would impair existing water rights, Ecology must consider pending water right applications. To the extent that grouping applications within one mile of the Columbia River would allow decisions to be made without consideration of applications outside the one-mile corridor that may be in hydraulic continuity with the river, the potential for impairment exists.

**Preferred Alternative:** WAC 173-152-030 states that Ecology will process new water right applications in the order they are received within a region. It also allows Ecology to make decisions from multiple water sources within a region, beginning with the oldest priority date in each source. The priority date is based on the date an application is filed with Ecology. Ecology defines a “source of water” as surface waters and/or ground water in hydraulic connection, meeting the following four conditions:

- a. They share a common recharge area;
- b. They are part of a common flow regime;
- c. They are separable from other water sources by effective barriers to hydraulic flow; and
- d. They are an independent water body for the purpose of water right administration, as determined by Ecology.

Generally, Ecology processes water rights applications on a WRIA-by-WRIA basis within a Region to maximize permitting efficiency. WRIsAs may include Columbia River applicants and non-Columbia River applicants.

Ecology will use a hybrid of two choices presented in the Draft EIS to coordinate VRA and non-VRA application processing based on: 1) the source of mitigation water acquired and placed into the Trust Program (e.g., mainstem savings versus tributary savings); and 2) whether saved water

must stay within the WRIA by statute (e.g., RCW 90.90.010(2)(a) without specific legislative authorization, as follows:

**Grouped within the Columbia River one-mile corridor.** If the source of mitigation water is a mainstem conservation, acquisition, or storage project, Ecology will group all applicants in the Columbia River one-mile corridor together. Ecology will process applications from the mainstem independent of WRIA boundaries when the source of water from a water supply project is from the mainstem Columbia, for example, the proposed Lake Roosevelt drawdown.

**Grouped within the Columbia River one-mile corridor with WRIA permitting.** If the source of mitigation water is a conservation or acquisition project within a tributary stream, Ecology will group applicants within the Columbia River one-mile corridor together with tributary WRIA permitting. Ecology will choose which WRIA to work in based on the availability of water rights within the Trust Program to match up with new permits from the Columbia River requiring mitigation to satisfy the no negative impact policy described in section 6.1.9. The senior-most applicant *within the WRIA* will be processed ahead of older mainstem applicants downstream if those older applicants cannot benefit from mitigation water that must stay within the WRIA.

**Example:** Consider two applicants. Applicant 1 has a priority date of 1992 and is located in WRIA 40. Applicant 2 has a priority date of 1994 and is located upstream in WRIA 45. As the senior applicant, Applicant 1 would normally be processed first. If mitigation water were obtained from the mainstem Columbia River, it would be assigned to mitigate the impacts of a permit that would be issued to Applicant 1. Applicant 2 would then be the next in line for processing.

However, if mitigation water is obtained within WRIA 45 through acquisition or transfer and is protected to the Columbia River, this mitigation water could not be used to mitigate a new permit within WRIA 40 unless Ecology first receives specific legislative authorization. Therefore, absent specific legislative authorization, Applicant 2 would be the senior-most water right applicant eligible to receive the benefit of the mitigation water. In this way, water supply will be matched with demand so that mitigation benefit is assigned to the senior-most applicant capable of benefiting from the source of the mitigation. See Figure 6-4 below.

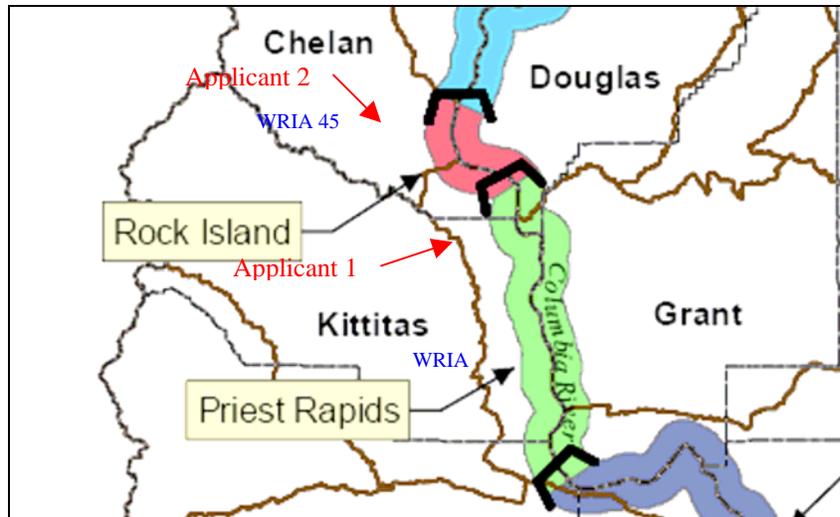


Figure 6-4. Example of applications grouped with the Columbia River one-mile corridor with WRIA permitting

### 6.1.13 Funding Projects Associated with a VRA

The Columbia River Management Act does not directly require Ecology to use conservation or storage funding to assist in providing mitigation water for VRAs. Ecology considered three alternatives for funding projects associated with VRAs.

**Mitigation for all applicants.** Ecology would spend conservation project money on projects that will provide mitigation for all applicants subject to their priority date in line regardless of whether they participate in a VRA or not.

**Mitigation only for applicants in VRAs.** Ecology would only spend conservation project money on projects that will provide mitigation for applicants in VRAs. Applicants not in VRAs that participate in the consultation process would provide their own mitigation.

**No mitigation for applicants in VRAs.** Ecology would not spend conservation project money for mitigation associated with VRAs. VRA participants would provide their own mitigation.

RCW 90.90.010 provides that one-third of the money in the Columbia River Basin Water Supply Account is to be used for projects other than new storage, including conservation projects. The net water savings achieved through conservation funded by the state are to be transferred to the state Trust Program in the proportion funded by the state (RCW 90.90.030). The Columbia River Water Management Act directs Ecology to begin to implement the Management Program with a \$10 million authorization and include funding projects that improve water use efficiency. Finally, nothing in RCW 90.90.030 regarding VRAs may be “interpreted or administered in a manner that precludes the processing of water right applications ... that are not included in a voluntary regional agreement.”

One of the objectives of VRAs is to develop new water supplies for out-of-stream uses (RCW 90.90.030). This in turn depends on development of mitigation for these new water rights, primarily through conservation. The second alternative is inconsistent with the objective of the law. Although limiting state funding to conservation projects associated with VRAs would not “preclude” the processing of non-VRA applications in the strictest sense (i.e., prevent the occurrence of or make impossible), it would in reality make it much more difficult for a non-VRA application to be approved. The first alternative under which Ecology would fund conservation projects that would provide mitigation to all applicants appears to be most consistent with the intent of the Columbia River Water Management Act and would avoid potential impairment of existing water rights/pending water right applications.

**Preferred Alternative:** The Columbia River Management Act does not directly require Ecology to use conservation or storage funding to assist in providing mitigation water for VRAs. However, Ecology will expend Account funds on projects that will provide mitigation for mainstem water right applicants, including those who participate in VRAs. Funding criteria for water supply projects will include incentives for federal, local, or private participation as a method of sharing responsibility for the costs of water supply development and to support long-term financial sustainability for the program.

#### **6.1.14 Inclusion of Exempt Wells in Water Use Inventory**

The Columbia River Management Act directs Ecology to develop a Columbia River mainstem water resources information system that includes “the total aggregate quantity of water rights issued under state permits and certificates and filed under state claims on the Columbia River mainstem and for ground water within one mile of the mainstem” (RCW 90.90.050(2)(a)). Exempt wells are not issued permits or certificates, and yet are allowed to withdraw water, and are subject to interruption in order to protect instream flows. Exempt wells are an important part of the water balance for the defined area and yet are not technically within the definition of what the information system is expected to include. Ecology considered two alternatives for including exempt wells in the inventory system.

**Do not include exempt wells in the information system.**

**Include exempt wells in the information system.**

The first alternative would adopt the most literal reading of the law: the inventory shall include water right permits, certificates and claims. However, this alternative also inserts an extra word into the law—“only.” While the law requires Ecology to include the listed water rights, it does not preclude Ecology from including additional water rights information, i.e., exempt wells. RCW 90.44.050 provides that:

“...to the extent that it is regularly used beneficially, shall be entitled to a right equal to that established by a permit issued under the provisions of this chapter: PROVIDED, HOWEVER, That the department from time to time may require the person or agency making any such small withdrawal to furnish information as to the means for and the quantity of that withdrawal: PROVIDED, FURTHER, That at the option of the party making withdrawals of ground waters of the state not exceeding five thousand gallons per day, applications under this section or

declarations under RCW 90.44.090 may be filed and permits and certificates obtained in the same manner and under the same requirements as is in this chapter provided in the case of withdrawals in excess of five thousand gallons a day.”

Thus, RCW 90.44.050 provides that beneficial use of exempt ground water withdrawals equate to a water right obtained by permit.<sup>5</sup>

The second alternative is a more complete accounting or estimation of water beneficially used under all water rights. This alternative is also consistent with the objective of the water resource inventory, which is to provide “the information necessary for effective mainstem [including groundwater within one-mile] water resources planning and management” (RCW 90.90.050(1)).

**Preferred Alternative:** Ecology will include uses of ground water exempt from permitting in the water use inventory. However, the first inventories will address only uses that rely on wells for which electronic information is available. Over time, as resources and opportunities allow, Ecology will expand the inventories to include additional exempt uses. Ecology will provide access on its website to the aggregate inventory data by 2009.

---

<sup>5</sup> A significant difference between permits, certificates, and claims is that water beneficially used under them can be changed pursuant to RCW 90.03.380 and RCW 90.44.100, whereas the Pollution Control Hearings Board has held that a water right based upon the ground water exemption cannot be changed under RCW 90.03.380:

“An exempt use under RCW 90.44.050 is illusory for the purposes of the change statute. Transferring an exempt right would not eliminate the ability of future owners of the property to claim an exempt use in the future. In essence, granting the change in place of use would accomplish nothing more than transferring a use without affecting the water rights appurtenant to the existing place of use. Any certificate of change issued for a transfer of the exempt use would constitute a grant of a new water right beyond the scope of a change application.” Knight, et al. v. Ecology, PCHB Nos. 94-61, 94-77, & 94-80 (1995).

## CHAPTER 7.0 REFERENCES

- Aguirre, W., and Poss, S. G., 2000. *Cyprinus carpio* Linnaeus, 1758. Non-Indigenous Species in the Gulf of Mexico Ecosystem - Gulf States Marine Fisheries Commission (GSMFC). Available from: [http://www.gsmfc.org/nis/nis/Cyprinus\\_carpio.html](http://www.gsmfc.org/nis/nis/Cyprinus_carpio.html).
- Alt, David D. and Donald W. Hyndman. 1984. *Roadside Geology of Washington*. Mountain Press Publishing Company. Missoula, Montana.
- American Bar Association. 2003. *Water Resources Committee Newsletter February 2003*. Accessed at <https://www.abanet.org/enviro/committees/waterresources/newsletter/feb03/statereport.html> on August 16, 2006.
- Azerrad, J. M., editor. 2004. *Management Recommendations for Washington's Priority Species, Volume V: Mammals*. Washington Department of Fish and Wildlife, Olympia.
- Bauer, H.H. and Hansen, A.J. 2000. *Hydrology of the Columbia Plateau Regional Aquifer System, Washington, Oregon, and Idaho*. United States Geological Survey Water-Resources Investigation Report 96-4106.
- Beckham, S. D. and P. W. Baxter. 1988. *Cultural Resource Survey of Selected Tracts in the Bonneville Dam Reservoir Area, Oregon and Washington*. Vol. I and II. Prepared for the U.S. Army Corps of Engineers Portland District by Heritage Research Associates, Inc., Eugene, Oregon, Report No. 73.
- Beckham, Stephen Dow. 1998. History Since 1846. In *Plateau*, edited by Deward E. Walker, Jr., pp. 149-173. *Handbook of North American Indians*, Vol. 12, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.
- Behnke, R.J. 1992. *Native trout of western North America*. American Fisheries Society Monograph 6. 275 pp.
- Benito, G., and O'Connor, J.E., 2003. Number and size of last-glacial Missoula floods in the Columbia River valley between the Pasco basin, Washington, and Portland, Oregon. *Geological Society of America Bulletin*, Vol. 115, no. 5, p. 624-638.
- Betts, B.J. 1999. Current status of Washington ground squirrels in Oregon and Washington. *Northwestern Naturalist* 80:35-38.
- Bhattacharjee, S. and D. Holland. 2005. *The Economic Impact of a Possible Irrigation-Water Shortage in Odessa Sub-Basin: Potato Production and Processing*. Washington State University School of Economic Sciences. WP-2005-4.
- Bonneville Power Administration (BPA). 1995. *United States Bureau of Reclamation, and United States Army Corps of Engineers. 1995. Columbia River System Operation Review Final Environmental Impact Statement*. November 1995.

- Bonneville Power Administration (BPA). 2001. *The Columbia River Inside Story*. Second Edition.
- Boreson, Keo. 1998. Rock Art. In *Plateau*, edited by Deward E. Walker, Jr., pp. 611-619. *Handbook of North American Indians*, Vol. 12, William C. Strurtevant, general editor, Smithsonian Institution, Washington, D.C.
- Bortleson, G.C., N.P. Dion, J.B. McConnell, and L.M. Nelson. 1976. Reconnaissance Data on Lakes in Washington, Volume 4, Clark, Cowlitz, Grays Harbor, Lewis, Pacific, Skamania, and Thurston Counties. *Water Supply Bulletin 43*. Vol. 4. Washington State Department of Ecology. Prepared in Cooperation with the U.S. Geological Survey.
- Brown, T.C. 2004. *The Marginal Economic Value of Streamflow from National Forests*. U.S. Forest Service, Rocky Mountain Research Station. Discussion Paper. DP-04-1, RMRS-4851. December 28, 2004.
- Cameron, T.A., W.D. Shaw, S.E. Ragland, J.M. Callaway, and S. Keefe. 1996. "Using Actual and Contingent Behavior Data with Differing Levels of Time Aggregation to Model Recreation Demand." *Journal of Agricultural and Resource Economics* 21 (1): 130-149. 1996
- Campbell, Sarah K. 1987. *Resource Protection Planning Process Identification Component for the Eastern Washington Protohistoric Study Unit*. An RP3 document prepared for the Washington State Department of Community Development and Office of Archaeology and Historic Preservation.
- Carmack, Corey. 2004. *Cultural Resources Survey Frenchman Hills Wetland Enhancement Project, Columbia Basin Project*. Prepared for the Washington Department of Fish and Wildlife by the U.S. Bureau of Reclamation.
- Cassidy, K. M. 1997a. Washington Gap Project 1991 Land Cover for Washington State, Version 6. Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle WA. January 1, 1997. Data obtained July 31, 2006, from website: [http://wdfw.wa.gov/wlm/gap/graphics/www\\_lulc.jpg](http://wdfw.wa.gov/wlm/gap/graphics/www_lulc.jpg)
- Cassidy, K.M. 1997b. Land cover of Washington State: Description and Management. Volume 1 in Washington State Gap Analysis Project Final Report (K.M. Cassidy, C.E. Grue, M.R. Smith, and K.M. Dvornich, eds.). Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle, Washington.
- Cederholm, C.J., D.H. Johnson, R.E. Bilby, L.G. Dominguez, A.M. Garrett, W.H. Graeber, E.L. Greda, M.D. Kunze, B.G. Marcot, J.F. Palmisano, R.W. Plotnikoff, W.G. Percy, C.A. Simenstad, and P.C. Trotter. 2000. *Pacific Salmon and Wildlife - Ecological Contexts, Relationships, and Implications for Management*. Special Edition Technical Report. Prepared for Wildlife-Habitat Relationships in Oregon and Washington. Washington Department of Fish and Wildlife, Olympia, Washington. Obtained December 28, 2006, from <http://wdfw.wa.gov/hab/salmonwild/salmonwild2.pdf>.

- Chance, David. 1967. *Archaeological survey of Coulee Dam National Recreation Area part 2: spring drawn-down of 1967*. Washington State University, Laboratory of Anthropology, Reports of Investigations No. 42.
- Chance, David. 1972. Fort Colville: The Structure of a Hudson's Bay Company Post, 1825 to 1871 and After. *University of Idaho Anthropological Research Manuscript Series*, No. 4. Moscow.
- Chance, David. 1977. Kettle Falls: 1976, Salvage Archaeology in Lake Roosevelt. *University of Idaho Anthropological Research Manuscript Series*, No. 39. Moscow.
- Chance, David. 1979. Kettle Falls: 1977, Salvage Archaeology in and Beside Lake Roosevelt. *University of Idaho Anthropological Research Manuscript Series*, No. 53. Moscow.
- Chance, David. 1982. Kettle Falls: 1971 and 1974, Salvage Archaeology in Lake Roosevelt. *University of Idaho Anthropological Research Manuscript Series*, No. 69. Moscow.
- Chatters, James C. 1979. Survey and Evaluation of Cultural Resources along Crab Creek and Dry Coulee, Grant County, Washington. Reconnaissance Report No. 22, Office of Public Archaeology, Institute for Environmental Studies, University of Washington. Seattle.
- Chief Joseph Dam Cultural Resource Management Cooperating Group (CJDCRMCG). 1998. *DRAFT Five Year Action Plan, Chief Joseph Dam and Rufus Woods Lake Cultural Resource Management*. On file, Department of Archaeology and Historic Preservation, Olympia.
- Cole, David. 1974. *Archaeological Research in the Bonneville Dam Pool Area*. Prepared for the National Park Service by the University of Oregon Museum of Natural History, Eugene.
- Collier, D., A. E. Hudson, and A. Ford. 1942. *Archaeology of the Upper Columbia Region*. University of Washington Publications in Anthropology 9(1). Seattle.
- Columbia Basin Development League (CBDL). 2005. "Reclaiming the Odessa Aquifer." Handout at October 26, 2005 Conference.
- Columbia Basin Fish and Wildlife Authority. 1991. The biological and technical justification for the flow proposal of the Columbia Basin Fish and Wildlife Authority. 72 pages. Figure 9, page 35, February, 1991
- Columbia River Intertribal Fish Commission. 1995. *Wy-Kan-Ush-Mi Wa-Kish-Wit; Spirit of the Salmon*. The Columbia River Anadromous Fish Plan of the Nez Pierce, Umatilla, Warm Springs and Yakama Tribes, Volume 1. Printed July 1996. Obtained at : <http://www.critfc.org/text/trp.html>
- Columbia-Snake River Irrigators Association (CSRIA). 2006. A Voluntary Regional Agreement between the Columbia Snake River Irrigators Association (CSRIA) and the Washington State Department of Ecology (Ecology). March 28, 2006.

- Corum, K. 1987. Estimation of Benefits of Fish and Wildlife Program. Memorandum to Fish Economics Group. May 20, 1987.
- Czech, Thomas V. 2006. Principles of Water Resources, History, Development, Management, and Policy. John Wiley & Sons, Inc. United States.
- Daily, G.C. 1997. Nature's Services: Societal Dependence on Natural Ecosystem. Washington, D.C.: Island Press.
- Daubenmire, Rexford. 1970. Steppe Vegetation of Washington. Wash. Agr. Expt. Sta. Tech. Bull. 62, Washington State University, Pullman, Washington. 131 pp.
- Dauble, D.D., M.J. Scott, and L.W. Vail. 2006 Review of the Columbia-Snake River Irrigation Association (CSRIA) Columbia River Water Management Proposal, A letter report to CRSIA prepared by Battelle, Pacific Northwest Division, Environmental Technology Directorate, Natural Resources Division, Richland, WA Battelle Project Number 50340. February 2006. 3p.
- DeHart, Michelle. 2006. *Fish Passage Center; Columbia Basin Fish and Wildlife Authority, 2005 Annual Report*, Project No. 199403300. BPA Report DOE/BP-00021186-1. Printed July 2006.  
[http://www.fpc.org/documents/annual\\_FPC\\_report/FPC%202005%20Annual%20Report-FINAL.pdf](http://www.fpc.org/documents/annual_FPC_report/FPC%202005%20Annual%20Report-FINAL.pdf)
- Dickson, Catherine. 2002. *Miima Taymut: A Historic Properties Management Plan for the John Day Reservoir*. Vol. 1 and 2. Prepared for the U.S. Army Corps of Engineers Portland District by the Cultural Resources Protection Program of the Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.
- Dictionary.com. 2006. Accessed at: <http://dictionary.reference.com/browse/acquisition>. September 22, 2006.
- Dion, N.P, G.C. Bortleson, J.B. McConnell, and L.M. Nelson. 1976a. Reconnaissance Data on Lakes in Washington, Volume 5, Chelan, Ferry, Kittitas, Klickitat, Okanogan, and Yakima Counties. Water Supply Bulletin 43. Vol. 5. Washington State Department of Ecology. Prepared in Cooperation with the U.S. Geological Survey.
- Dion, N.P, G.C. Bortleson, J.B. McConnell, and L.M. Nelson. 1976b. Reconnaissance Data on Lakes in Washington, Volume 6, Adams, Benton, Douglas, Franklin, Grant, Lincoln, Walla Walls, and Whitman Counties. Water Supply Bulletin 43. Vol. 6. Washington State Department of Ecology. Prepared in Cooperation with the U.S. Geological Survey.
- Dobler, F.C., J. Eby, C. Perry, S. Richardson, and M. Vander Haegen. 1996. Status of Washington's Shrub-Steppe Ecosystem: Extent, ownership, and wildlife/vegetation relationships. Phase One Completion Report. Washington Department of Fish and Wildlife. Olympia, Washington. 39 pp.

- Draper, J.A. 1992. The 1992 Options Analysis Study: Cultural Resources. Contribution in Cultural Resource Management No. 38. Center for Northwest Anthropology, Washington State University, Pullman.
- Eastern Washington University (EWU). 2001. Fisheries Department, unpublished data.
- Ebbesmeyer, C. C., and W. Tangborn. 1992. Linkage of reservoir, coast, and strait dynamics, 1936-1990: Columbia River Basin, Washington Coast, and Juan de Fuca Strait. Pp. 288-299 In *Interdisciplinary Approaches in Hydrology and Hydrogeology*. St. Paul, MN: American Institute of Hydrology.
- Economic and Engineering Services, Inc (EES). 2003. Watershed Management Plan. Yakima River Basin. January 2003.
- Environment Canada. 2003. [http://www.ec.gc.ca/science/sandejan00/article3\\_e.html](http://www.ec.gc.ca/science/sandejan00/article3_e.html).
- Environmental Protection Agency (EPA). National Air Quality and Emissions Trends Report, 2003. Obtained from website: [http://www.epa.gov/airtrends/non\\_table.pdf](http://www.epa.gov/airtrends/non_table.pdf) September 5, 2006.
- Environmental Working Group. 2006. Farm Subsidy Database: Washington. Obtained December 29, 2006, from <http://www.ewg.org/farm/progdetail.php?fips=53000&progcode=total&page=county>
- Evans, Krista Lee. 2004. Comparison of Montana and Idaho Water Law.
- Federal Columbia River Power System. 2001. The Columbia River Inside Story. Produced by the Bonneville Power Administration, U.S. Bureau of Reclamation, and U.S. Army Corps of Engineers.
- Fickeisen, D.H. and D.R. Geist. 1993. Resident Fish Planning: Dworshak Reservoir, Lake Roosevelt, and Lake Pend Oreille. Report prepared by Pacific Northwest Laboratory Richland, Washington, Battelle Memorial Institute for the U.S. Department of Energy, Bonneville Power Administration Division of Fish and Wildlife. Portland, Oregon 97208-3621 Project No. 93-026 Task Order No. DE-AT79-92BP61203 to Master Agreement DE-AI79-86BP62611, December 1993 45p. +app.
- Fish Passage Center. 2006. The effect of mainstem flow, water velocity and spill on Chinook and steelhead populations of the Columbia River. October 12, 2006. Presentation to the Columbia River Inter-Tribal Fish Commission. Portland, Oregon. Accessed at: [http://www.fpc.org/documents/misc\\_reports/141-06.pdf](http://www.fpc.org/documents/misc_reports/141-06.pdf).
- Fluharty, D.L. 2000. Characterization and Assessment of Economic Systems in the Interior Columbia Basin: Fisheries. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Gen. Tech. Rep. PNW-GTR-451. April. 2000.
- Foster, J. H., et al. 1984. Columbia Basin Wildlife/Irrigation Development Study. U.S.D.I., Bureau of Reclamation, REC-ERC-83-6. 245pp

- Frankel, A.D., Petersen, M.D., Mueller, C.S., Haller, K.M., Wheeler, R.L., Leyendecker, E.V., Wesson, R.L., Harmsen, S.C., Cramer, C.H., Perkins, D.M., Rukstales, K.S. 2002. Documentation for the 2002 Update of the National Seismic Hazard Maps. Obtained August 15, 2006 from website:  
[http://earthquake.usgs.gov/research/hazmaps/products\\_data/2002/2002April03/WUS/WUS5hz500v4.pdf](http://earthquake.usgs.gov/research/hazmaps/products_data/2002/2002April03/WUS/WUS5hz500v4.pdf)
- Franklin, J.F. and C.T. Dyrness. 1973. *Natural Vegetation of Washington and Oregon*. Oregon State University Press. Corvallis, Oregon. 452 pp.
- Galm, J. and R. Masten. 1988. *A Management Plan for Cultural Resources at the Rock Island Hydroelectric Project, Chelan and Douglas Counties, Washington*. Prepared for the Chelan County Public Utility District No. 1 FERC Project No. 943 by Archaeological and Historical Services, Eastern Washington University, Report No. 100-66.
- Galm, J., G.D. Hartmann, R.A. Masten, and revised by M.L. Stilson. 1987. *Resource Protection Planning Process: Mid-Columbia Study Unit*. An RP3 document prepared for the Washington State Department of Community Development and Office of Archaeology and Historic Preservation.
- Galm, Jerry (editor). 1994. *An Overview and Assessment of the Cultural Resources in the Lake Roosevelt Basin of the Northeastern Washington*. Prepared by Archaeological and Historical Services, Eastern Washington University, Report No. 100-83.
- Garrett, A.A. 1968. *Ground-Water Withdrawal in the Odessa Area, Adams, Grant, and Lincoln Counties, Washington*. Washington State Department of Water Resources Water-Supply Bulletin No. 31.
- Garth, Thomas R. 1951. *Archeological Excavations at Fort Walla Walla*. Region Four, National Park Service. San Francisco.
- Gleick, P., D. Haasz, C. Henges-Jeck, V. Srinivasan, G. Wolff, K.K. Cushing, and A. Mann. 2003. *Waste Not, Want Not: The Potential for Urban Water Conservation in California*. Pacific Institute. November 2003.
- Grabert, Garland F. 1968. *The Astor Fort Okanogan, A Final Report on Salvage Archaeology in the Wells Reservoir—Part II*. University of Washington Department of Anthropology Reports in Archaeology Vol. 2, Seattle.
- Griffin, D. and T. Churchill. 2001. *Prehistory and History of the Columbia River Gorge Bonneville Pool Area – North Side: An Archival Review of Cultural Resource Potential*. Prepared for the members of the Wana-Pa Koot Koot Working Group and the U.S. Army Corps of Engineers Portland District by Archaeological Frontiers for the Yakama Nation, Toppenish.
- Griffin, R.C. 2005. *Review of the Columbia River Initiative Cost-Benefit Analyses*. September 2005.

- Griffin, R.C. 2006. *Water Resource Economics: The Analysis of Scarcity, Policies, and Projects*. Cambridge, Massachusetts: MIT Press.
- H.R. 545, 58<sup>th</sup> Leg., Reg. Session. (ID. 2006) <http://www3.state.id.us/oasis/H0545.html>  
[http://leg.state.mt.us/content/lepo/2003\\_2004/environmental\\_quality\\_council/staffmemos/statewaterlaws.pdf](http://leg.state.mt.us/content/lepo/2003_2004/environmental_quality_council/staffmemos/statewaterlaws.pdf)
- Hall, S. and R. Dight. 1986. *Ground Water Resource Protection: A Handbook for Local Planners and Decision Makers in Washington State*. Prepared for King County Planning Division in cooperation with the Washington Department of Ecology. December 1986.
- Hamilton, J.R., N.K. Whittlesey, M.H. Robison, and J. Ellis. 1991. "Economic Impacts, Value Added, and Benefits in Regional Project Analysis." *American Journal of Agricultural Economics*. 73 (2): 334-344.
- Hamilton, S. and B. Hicks. 2003. *REVISED Chief Joseph Dam Project Area Historic Properties Inventory 2000-2001*. Prepared for the U.S. Army Corps of Engineers Seattle District by the Confederated Tribes of the Colville Reservation History/Archaeology Department, Nespelem.
- Hamlet, A., D. Fluharty, D. Lettenmaier, N. Mantua, E. Miles, P. Mote, L. Whitley Binder. 2001. *Effects of Climate Change on Water Resources in the Pacific Northwest: Impacts and Policy Implications*. JISAO Climate Impacts Group, University of Washington. July 3, 2001.
- Hartmann, G. D. and M. Gill. 2004. *Archaeological Monitoring Survey of the Lake Pateros Archaeological District for 2004, Wells Hydroelectric Project, Douglas and Okanogan Counties, Washington*. Prepared for the Public Utility District No. 1 of Douglas County by Western Shore Heritage Services, Inc., Bainbridge Island.
- Hartmann, Glenn D. 1986. *DRAFT Cultural Resources Assessment of BPA's Proposed Intertie Development and Use, Lake Roosevelt, Lake Pend Oreille, Lake Koocanusa, Dworshak Reservoir, and Hungry Horse Reservoir*. Prepared by Archaeological and Historical Services, Eastern Washington University, Report No. 100-52.
- Harvey, David W. 1989. *Resource Protection Planning Process (RP3) Study Unit: Transportation*. An RP3 document prepared for the Washington State Department of Community Development and Office of Archaeology and Historic Preservation.
- Haynes, R.W. and A.L. Horne. 1997. "Chapter 6: Economic Assessment of the Basin." In T.M. Quigley and S.J. Arbelbide, eds., *An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basins, Volume IV*. General Technical Report PNW-GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. June. 1715-1869.
- Hays, D. W., M. J. Tirhi, M. J., and D. W. Stinson. 1998. *Washington State Status Report for the Sage Grouse*. Washington Department of Fish and Wildlife, Olympia. 62 pp.

- Hermanson, R. 1991. *Washington Ground Water: A Vital Resource*. Washington State University. August 1991.
- Hey, D.L., J.A. Kostel, A.P. Hurter, and R.H. Kadlec. 2005. *Nutrient Farming and Traditional Removal: an Economic Comparison*. Water Environment Research Foundation. 03-WSM-6CO. p. ES-2. 2005. Obtained on June 8, 2006, from website: <http://www.wetlands-initiative.org/images/03WSM6COweb.pdf>
- Hicks, Brent (editor). 2000. *McNary Reservoir Cultural Resources Management Plan*. Prepared for the U.S. Army Corps of Engineers Walla Walla District by the Confederated Tribes of the Colville Reservation History/Archaeology Department, Nespelem.
- Houston, L.L., J.D. Kline, and R.J. Alig. 2002. *Economics Research Supporting Water Resource Stewardship in the Pacific Northwest*. U.S. Department of Agriculture, Forest Service. PNW-GTR-550. July 2002. Obtained August 18, 2006, from website: <http://www.fs.fed.us/pnw/pubs/gtr550.pdf#search=%22water%20externalities%20columbia%20river%22>
- Huppert, Daniel, Gareth Green, William Beyers, Andrew Subkoviak, and Andrew Wenzl. 2004. *Economics of Columbia River Initiative: Final Report to the Washington Department of Ecology and CRI Economics Advisory Committee*. University of Washington and Seattle University. January 12, 2004.
- Independent Economic Analysis Board. 2005. *Economic Effects from Columbia River Basin Anadromous Salmonid Fish Production*. Northwest Power and Conservation Council. IEAB 2005-1. December 2005.
- Interagency Committee for Outdoor Recreation. 2002. *An Assessment of Outdoor Recreation in Washington State. A State Comprehensive Outdoor Recreation Planning (SCORP) Document 2002-2005*. July 2002.
- Jacobson, J.E. and M.C. Snyder. 2000. *Shrubsteppe Mapping of Eastern Washington Using Landsat Satellite Thematic Mapper Data*. Spatial Data Management Section, Science Division, Wildlife Program, Washington Department of Fish and Wildlife, Olympia, Washington.
- JISAO/SMA Climate Impact Group. 1999. *Impacts of Climate Change – Pacific Northwest. A Summary of the Pacific Northwest Regional Assessment Group*. November 1999.
- Johnson, A., D. Norton and B. Yake. 1988. *An Assessment of Metals Contamination in Lake Roosevelt*. Washington State Department of Ecology Toxics Investigations/Ground Water Monitoring Section. Olympia, Washington. 98504-6811. June 1988 (Revised December 1989).
- Johnson, A., D. Serdar and D. Norton. 1991b. *Spatial Trends in TCDD/TCDF Concentrations in Sediment and bottom Fish Collected in Lake Roosevelt (Columbia River)*. Washington State Department of Ecology, Environmental Investigations and Laboratory Services,

- Toxics, Compliance, and Ground Water Investigations Section. Olympia, Washington. 98504-6814. Publication No. 91-29. June 1991.
- Johnson, A., D. Serdar and S. Magoon. 1991a. Polychlorinated Dioxins and Furans in Lake Roosevelt (Columbia River) Sportfish, 1990. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Toxics Investigations and Ground Water Monitoring Section. Olympia, Washington. 98504-8711. Publication No. 91-4. March 1991.
- Johnson, D. H. and T. A O'Neil. 2001. Wildlife-habitat relationships in Oregon and Washington. D.H Johnson and T.A. O'Neil - managing directors. Oregon State University Press, Corvallis, Oregon. 768pp.
- Johnson, K.P. and J.R. Kort. 2004. "2004 Redefinition of the BEA Economic Areas." Survey of Current Business November: 68-75.
- Jones, Joseph L. and Richard J. Wagner. 1995. Water-Quality Assessment of the Central Columbia Plateau in Washington and Idaho, Analysis of Available Nutrient and Pesticide Data for Ground Water, 1942-92. U.S. Geological Survey Water Resources Investigation Report 94-4258. Pre-Publication Copy.
- Kauffman, J.B., M. Mahrt, L.A. Mahrt, and W.D. Edge. 2001. Wildlife of Riparian Habitats. *In* Wildlife-habitat relationships in Oregon and Washington (D. H. Johnson and T. A. O'Neil, eds). Oregon State University Press, Covallis. 768p.
- Kennedy/Jenks Consultants (Kennedy/Jenks), GeoEngineers, Inc., and Water & Natural Resources Group. 2005. Watershed Assessment Report Water Resource Inventory Area 43 Upper Crab Creek-Wilson Creek Watershed. Prepared for Lincoln County. Prepared by Kennedy/Jenks Consultants in association with GeoEngineers, Inc. and Water & Natural Resources Group. November 2005.
- Knick, Steven T., David S. Dobkin, John T. Rotenberry, Michael A. Schroeder, W. Matthew Vander Haegen and Charles Van Riper. 2003. Teetering on the Edge or Too Late? Conservation and Research Issues for Avifauna of Sagebrush Habitats. Report of the Cooper Ornithological Society Committee for Conservation of Sagebrush Ecosystems. *The Condor* 105:611-634.
- Knutson K. L., and V. L. Naef. 1997. Management Recommendations For Washington's Priority Habitats: Riparian. Washington Department of Fish and Wildlife. Olympia, Washington. 181 pp.
- Larsen, E. M., J. M. Azerrad, and N. Nordstrom, eds. 2004. Management Recommendations for Washington's Priority Species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia.
- Lasmanis, Raymond. 1991. *The Geology of Washington: Rocks and Minerals*, v. 66, no. 4, p. 262-277.

- Lenihan, D. J., T. L. Carrell, S. Fosberg, S. L. Ray, and J. A. Ware. 1981. The Final Report of the National Reservoir Inundation Study, Vol. 1 and 2. U.S. National Park Service, SWRO. Santa Fe, NM.
- Leonard W.P., Brown, H.A., Jones, L.L.C., McAllister K.R., and Storm R.M. 1993. Amphibians of Washington and Oregon. Seattle Audubon, Seattle, WA.
- Leonard, L. J., Hyndman, R.D., and Mazzotti, S., 2004. Coseismic subsidence in the 1700 great Cascadia earthquake: Coastal estimates versus elastic dislocation models. Geological Society of America Bulletin, Vol. 116, No. 5/6, pp. 655-670.
- Leonard, W.P. 2006. AmphibiaWeb: Information on amphibian biology and conservation. Berkeley, California. Accessed on August 29, 2006 from website <http://amphibiaweb.org>
- Littlefield, C. D., and G. L. Ivey. 2002. Washington State Recovery Plan for the Sandhill Crane. Washington Department of Fish and Wildlife, Olympia, Washington.
- Luzier, J.E. and J.A. Skrivan. 1975. Digital-Simulation and Projection of Water-Level Declines in Basalt Aquifers of the Odessa-Lind Area, East-Central Washington. U.S. Geological Survey Water Supply Paper 2036.
- Luzier, J.E. and R.J. Burt. 1974. Hydrology of basalt aquifers and depletion of groundwater in east central Washington. Washington Department of Ecology Water Supply Bulletin 33, 53pp.
- Mann, G.M., and Meyer, C.E. 1993. Late Cenozoic structure and correlations to seismicity along the Olympic-Wallowa Lineament, northwest United States, Geological Society of America Bulletin, Vol. 105, pp. 853-871.
- Masten, R. and J. Galm. 1986. *A Cultural Resources Inventory for the Grand Coulee Project: Douglas, Grant, Ferry, Lincoln, Okanogan, and Stevens Counties, Washington*. Prepared for the U.S. Bureau of Reclamation, Boise, Idaho by Archaeological and Historical Services, Eastern Washington University, Report No. 100-55.
- McCrumb, D.R., Galster, R.W., West, D.O., Crosson, R.S., Ludwin, R.S., Hancock, W.E., and Mann, L.V., 1989. Tectonics, Seismicity, and Engineering Seismology in Washington: in *Engineering Geology in Washington, Volume I*, Washington Division of Geology and Earth Resources Bulletin 78, pp. 97-120.
- McGranahan, D.A. 1999. Natural Amenities Drive Rural Population Change. U.S. Department of Agriculture, Economic Research Service, Food and Rural Economics Division. Agricultural Economic Report No. 781. September 1999.
- McKie James and David Chance. 1980. An archaeological survey of fourteen development areas, Coulee Dam National Recreation Area. Laboratory of Anthropology, University of Idaho, Moscow.

- McLellan, H.J., C. Lee, B. Scofield, and D. Pavlik. 2003. Lake Roosevelt Fisheries Evaluation Program, 1999 Annual Report. Prepared by Department of Natural Resources, Spokane Tribe of Indians, Wellpinit, Washington, 99040 for Bonneville Power Administration, Division of Fish and Wildlife, Portland Oregon.
- Memorandum of Understanding Concerning the State of Washington's Columbia River Initiative. 2004.
- Miller, Carey. 2001. *Lower Monumental Reservoir Cultural Resource Inventory Survey Report*. Prepared for the U.S. Army Corps of Engineers Walla Walla District by the Cultural Resources Protection Program of the Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.
- Miller, Jay. Middle Columbia River Salishans. 1998. In *Plateau*, edited by Deward E. Walker, Jr., pp. 253-270. Handbook of North American Indians, Vol. 12, William C. Strurtevant, general editor, Smithsonian Institution, Washington, D.C.
- Minor, Rick. 1986. *Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Lower Columbia Study Unit*. An RP3 document prepared for the Washington State Department of Community Development and Office of Archaeology and Historic Preservation by Heritage Research Associates, Eugene.
- Mitchell, B. 1968. *By River, Trail and Rail: A Brief History of the First Century of Transportation in North Central Washington, 1811-1911*. Wenatchee Daily World, Wenatchee, WA.
- Montgomery Water Group (MWG). 1995. East Columbia Basin Irrigation District. Comprehensive Water Conservation Plan. September 1995.
- Montgomery Water Group (MWG). 2002b. Quincy-Columbia Basin Irrigation District Water Conservation Plan. March 2002.
- Montgomery Water Group (MWG). 2003. Columbia Basin Project. Water Supply, Use and Efficiency Report. September 2003.
- Montgomery Water Group (MWG). 2000. Greater Wenatchee Irrigation District Water Conservation Plan. June 2000.
- Montgomery Water Group (MWG). 2002a. Brewster Flat Irrigation District Water Conservation Plan. June 2002.
- Montgomery Water Harza (MWH). 2005. *Columbia River Mainstem Storage Options, Washington: Off-Channel Storage Assessment Pre-Appraisal Report*. December 2005.
- Municipal Water Law Agency Responsibilities Outline June 23, 2006  
[http://www.ecy.wa.gov/programs/wr/rights/muni\\_wtr.html](http://www.ecy.wa.gov/programs/wr/rights/muni_wtr.html)

- National Marine Fisheries Service (NMFS). 2004. Endangered Species Act – Section 7 Consultation Biological Opinion, Consultation on Remand for Operation of the Columbia River Power System and 19 Bureau of Reclamation Projects in the Columbia Basin (Revised and reissued pursuant to court order, NWF v. NMFS, Civ. No. CV 01-640-RE (D. Oregon)). November 30, 2004.
- National Park Service (NPS). 2005. Natural Resources of the Lake Roosevelt National Recreation Area. Accessed on August 1, 2006 from website: <http://www.nps.gov/laro/nature.htm>.
- National Research Council of the National Academies (NRC). 2004. *Managing the Columbia River: Instream Flows, Water Withdrawals, and Salmon Survival*. Washington, DC: The National Academies Press.
- National Research Council of the National Academies (NRC). 2005. *Valuing Ecosystem Resources: Toward Better Environmental Decision-Making*. National Academies Press.
- Nelson, Margaret. 2006. *A Cultural Resource Overview of the Ice Harbor Reservoir*. Prepared for the U.S. Army Corps of Engineers Walla Walla District by the Cultural Resources Protection Program of the Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.
- Netboy, Anthony. 1980. *The Columbia River Salmon and Steelhead Trout: Their Fight for Survival*. University of Washington Press, Seattle.
- NOAA Fisheries (NOAA). 2006a. Chinook Salmon [http://www.nmfs.noaa.gov/prot\\_res/species/fish/Chinook\\_salmon.html](http://www.nmfs.noaa.gov/prot_res/species/fish/Chinook_salmon.html) <http://www.nmfs.noaa.gov/1salmon/salmesa/chinookswit.html>.
- NOAA Fisheries (NOAA). 2006b. Chum Salmon. [http://www.nmfs.noaa.gov/prot\\_res/species/fish/chum\\_salmon.html](http://www.nmfs.noaa.gov/prot_res/species/fish/chum_salmon.html) and <http://www.nmfs.noaa.gov/1salmon/salmesa/chumswit.html>.
- NOAA Fisheries (NOAA). 2006c. Coho Salmon. [http://www.nmfs.noaa.gov/prot\\_res/species/fish/coho\\_salmon.html](http://www.nmfs.noaa.gov/prot_res/species/fish/coho_salmon.html) and <http://www.nmfs.noaa.gov/1salmon/salmesa/cohoswit.html>.
- NOAA Fisheries (NOAA). 2006d. Sockeye Salmon. [http://www.nmfs.noaa.gov/prot\\_res/species/fish/sockeye\\_salmon.html](http://www.nmfs.noaa.gov/prot_res/species/fish/sockeye_salmon.html).
- NOAA Fisheries (NOAA). 2006e. Steelhead Trout. [http://www.nmfs.noaa.gov/prot\\_res/species/fish/steelhead\\_trout.html](http://www.nmfs.noaa.gov/prot_res/species/fish/steelhead_trout.html) and <http://www.nwr.noaa.gov/1salmon/salmesa/shhswit.html>.
- Northwest Power Planning Council (NPPC). 2004. Final Review Draft Kootenai River subbasin assessment. Obtained August 16, 2004 from website: <http://www.nwcouncil.org/fw/subbasinplanning/kootenai/plan/>.

- Office of Financial Management (OFM). 2002. Washington State County Population Projections for Growth Management by Age and Sex: 2000-2025. January 2002 Projections. Obtained July 31, 2006, from website: <http://www.ofm.wa.gov/pop/gma/countypop.pdf>.
- Office of Financial Management (OFM). 2005. 2005 Population Trends. Obtained July 31, 2006, from website: [http://www.ofm.wa.gov/pop/poptrends/poptrends\\_05.pdf](http://www.ofm.wa.gov/pop/poptrends/poptrends_05.pdf).
- Office of Financial Management (OFM). 2006. Office of Financial Management April 1 Population Determinations - Official Change from April 1, 1996 to April 1, 2006. June 29, 2006. Obtained July 31, 2006, from website: <http://www.ofm.wa.gov/pop/april1/gmacountychange.pdf>.
- Okanogan County. Okanogan County Demographics. Obtained from website: <http://okanogancounty.org/DEMO.HTM> September 5, 2006.
- Olsen, D. 2006. Pacific Northwest Project Legislative Briefing Paper Transmittal to Oregon State Legislators and Water Resources Policy Makers, dated November 15, 2006, re: The Regional Economic Significance of Columbia River Water Rights from the McNary-John Day Pools.
- Olsen, D. 2005. Memorandum to Jay Manning, Director Washington Department of Ecology by Darryll Olsen, Regional Planner/Resource Economist for the Columbia-Snake River Irrigators Association (CSRIA) dated June 22, 2005 re: The "Ghost" [of empirical science] haunting the NRC/NAS Columbia River Report. 2 pp. Access Washington. State Facts. <http://www.access.wa.gov/government/awgeneral.asp>. 1998-2002.
- Olsen, D. and White, T. 2004. Pacific Northwest Project Technical Memorandum to Columbia River Initiative (CRI) Economics Review Team: Dan Huppert, Ph.D., School of Marine Affairs, UW; Gareth Green, Ph.D., School of Business and Economics, Seattle Un.; William Beyers, Ph.D., Dept. of Geography, UW; and Mr. Gerry O'Keefe, CRI Coordinator; and the Water Science and Technology Board, NAS Technical Committee, dated October 13, 2003, revised April 2, 2004, re: Economic Analysis Methodology Illustration and Review: Estimating the Value of Water for Key Resource Sectors from the Mainstem Columbia River.
- Orr, E.L., and Orr, N.O. 1996. Geology of the Pacific Northwest. McGraw-Hill Companies.
- Ortolano, L., Kao Cushing, K., and contributing authors. 2000. Grand Coulee Dam and the Columbia Basin Project, USA, Executive Summary. World Commission on Dams. Cape Town, South Africa. Obtained December 29, 2006, from [http://www.dams.org/kbase/studies/us/us\\_exec.htm](http://www.dams.org/kbase/studies/us/us_exec.htm)
- Parkos, J.J III and D.H. Wahl. 2000. Center for Aquatic Ecology; Victor Santucci, Jr., Max McGraw Wildlife Foundation. Illinois Natural History Survey (INHS). Available from: <http://www.inhs.uiuc.edu/chf/pub/surveyreports/jan-feb00/fish.html>.

Partridge, M. and D. Rickman. 2003. "The Waxing and Waning of Regional Economies: the Chicken-Egg Question of Jobs Versus People." *Journal of Urban Economics*. 53: 76-97.

Pearcy, W. 1992. *Ocean ecology of North Pacific salmonids*. University of Washington Press. Seattle, WA.

Petrosky, C., H. Schaller and P. Wilson. 2006. *Delayed Mortality of Columbia River Salmon. Exploring evidence concerning delayed hydropower system mortality for Snake River spring/summer Chinook*. Draft Technical Document developed for the Framework/Policy Work Groups. Federal Columbia River Power System Salmon Biological Opinion Remand. By USFWS, Vancouver, Washington and Idaho Department of Fish and Game, Boise, Idaho.

Pharris, J.K. and P.T. McDonald. 2000. *An Introduction to Washington Water Law*, Office of the Attorney General, January 2000.

Pickett, Paul J., Helen Reuda, and Mike Herold. 2004. *Total Maximum Daily Load for Total Dissolved Gas in the Mid-Columbia River and Lake Roosevelt Submittal Report*. Washington State Department of Ecology Publication No. 04-03-002. June 2004.

Pimentel, D., C. Harvey, P. Resosudarmo, K. Sinclair, D. Kurz, M. McNair, S. Crist, L. Shpritz, L. Fitton, R. Saffouri, and R. Blair. 1995. "Environmental and Economic Costs of Soil Erosion and Conservation Benefits." *Science* 267. February 24: 1117-1122.

Public Utility District No. 2 of Grant County, Washington. 2003. *Priest Rapids Hydroelectric Project No. 2114. Final Application for a New License. Exhibit A: Project Description*. Submitted to Federal Energy Relicensing Commission. Accessed on January 2, 2007 at: [http://www.gcpud.org/relicensing/applications/Disk%201/Exhibits/Exhibit%20A/Ex\\_A\\_FLA.pdf](http://www.gcpud.org/relicensing/applications/Disk%201/Exhibits/Exhibit%20A/Ex_A_FLA.pdf)

Quinn, M. et al. 2001. *Draft Crab Creek subbasin summary, March 2, 2001. Summary*. Report of interagency team to Northwest Power Planning Council, Portland, OR. 91 pp.

Ratke, H.D. and S.W. Davis. 1995. *An Estimate of the Asset Value for Historic Columbia River Salmon Runs*. The Institute for Fisheries Resources. Eugene, OR. December.

Ray, Verne F. 1936. *Native Villages and Groupings of the Columbia Basin*. *Pacific Northwest Quarterly* 27(2):99-152.

Resource Dimensions. 2006. *Economic Analysis of the Columbia River Basin Water Mitigation Program (Draft)*. Prepared for Columbia River Inter-Tribal Fish Commission. September 28.

Ribaldo, M. and R. Johansson. 2006. "Water Quality: Impacts of Agriculture." In *Agricultural Resources and Environmental Indicators, 2006 Edition*. Edited by K.D. Wiebe and N. Gollehon. U.S. Department of Agriculture, Economic Research Service. Obtained August 17, 2006, from website: [http://www.ers.usda.gov/publications/arei/eib16/eib16\\_2-2.pdf](http://www.ers.usda.gov/publications/arei/eib16/eib16_2-2.pdf).

- Ribaudo, M.C. 1989. Water Quality Benefits from the Conservation Reserve Program. U.S. Department of Agriculture, Economic Research Service. Agricultural Economic Report. 606. February.
- Roulette, B., A. Finley, P. Solimano, J. Wilt, and C. Hodges. 2001. *Results of a Cultural Resources Inventory Survey of Lake Roosevelt between Elevations 1289 and 1310 feet above mean sea level and Tailrace Terrace*. Prepared for the Confederated Tribes of the Colville Reservation History/Archaeology Department by Applied Archaeological Research, Portland, Report No. 76.
- Russell, Betsy Z. 2006. The Spokesman-Review, <http://www.spokesmanreview.com/blogs/boise/archive.asp>.
- Ryker, Sarah J. and Lonna M. Frans. 2000. Summary of nitrate concentrations in ground water of Adams, Franklin, and Grant Counties, Washington, fall 1998: a baseline for future trend analysis. U.S. Geological Survey Water-Resources Investigations Report 99-4288.
- Saxton, K., Chandler, D., Schillinger, W. 2001. Wind Erosion and Air Quality Research in the Northwest U.S. Columbia Plateau: Organization and Progress, in Stott, D.E., Mohtar, R.H., Steinhardt, G.C. (eds). *Sustaining the Global Farm*. Selected papers from the 10<sup>th</sup> International Soil Conservation Organization Meeting held May 24-29, 1999 at Purdue University and the USDA-ARS National Soil Erosion Research Laboratory, p. 766-770.
- Schaible, G.D. 2000. "Economic and Conservation Tradeoffs of Regulatory vs. Incentive-based Water Policy in the Pacific Northwest." *Water Resources Development*. 16 (2): 221-238.
- Schroeder, M. A., and W. M. Vander Haegen. 2006. Use of Conservation Reserve Program fields by Greater Sage-grouse and other Shrubsteppe-associated Wildlife in Washington State. Technical report prepared for US Department of Agriculture Farm Service Agency. Washington Department of Fish and Wildlife, Olympia, WA.
- Schroeder, M.A., D.W. Hays, M.A. Murphy, and D.J. Pierce. 2000. Changes in the Distribution and Abundance of Columbian Sharp-tailed grouse in Washington. Washington Department of Fish and Wildlife, Bridgeport, Washington.
- Schuster, J. Eric. 2002. Geologic Map of Washington. Washington State Department of Natural Resources Website. Obtained August 15, 2006, from website: <http://dnr.wa.gov/geology/pdf/pagemap.pdf>.
- Scott, Shane. 2003. *Archaeological and Cultural Resources Monitoring of the Washington Shore of the Bonneville Pool*. Prepared for members of the Wana-Pa Koot Koot Working Group and the U.S. Army Corps of Engineers Portland District by the Confederated Tribes of the Yakama Nation, Toppenish.
- Scott, W.E., Iverson, R.M., Vallance, J.W., and Hildreth, W. 1995. Volcano Hazards in the Mount Adams Region, Washington: U.S. Geological Survey Open-File Report 95-492, 11 pp.

Scott, W.E., Pierson, T.C., Schilling, S.P., Costa, J.E., Gardner, C.A., Vallance, J.W., Major, J.J. 1997. Volcano Hazards in the Mount Hood Region, Oregon: U.S. Geological Survey Open-File Report 97-89, 14 pp.

Secretary of State. Census Data. Obtained August 16, 2006, from website:  
<http://www.digitalarchives.wa.gov/RecordSeriesInfo.aspx?rsid=3>

Shive, J., S. Hackenberger and P. Rice. 2004 *FINAL DRAFT Historic Properties Management Plan, Public Utility District No. 2 of Grant County, Ephrata, Washington, Priest Rapids Hydroelectric Project FERC Project No. 2114*. Prepared for the Public Utility District No. 2 of Grant County by Legacy Consulting Services and Earth Imaging Associates, Ellensburg.

Spatial Climate Analysis Service. Oregon State University. 2000. Available online at <http://www.ocs.orst.edu/pub/maps/Precipitation/Total/States/WA/wa.gif>. Accessed on July 27, 2006.

Sprandel, G.L., R.L. Cailteux and D.T. Cobb. 2002. Influence of reservoir drawdown on bird use of Lake Talquin, Florida, *Lake and Reservoir Management*. 18(2):164-176.

Stinson, D. W., D. W. Hays, and M. A. Schroeder. 2004. Washington State Recovery Plan for the Greater Sage-Grouse. Washington Department of Fish and Wildlife, Olympia, Washington.

Suttles, Wayne (editor). 1990. *Northwest Coast*. Handbook of North American Indians, Vol. 7, William C. Strutervant, general editor, Smithsonian Institution, Washington, D.C.

Thorsen, G. W., 1989. Landslide Provinces in Washington: in *Engineering Geology in Washington, Volume I*, Washington Division of Geology and Earth Resources Bulletin 78, p. 71-90.

Tolan, T.L., and S.P. Reidel. 1989. Revisions to the estimates of the areal extent and volume of the Columbia River Basalt Group. Geological Society of America, Special Paper 239, p. 1-20.

Topinka. 1997. Cascade Range Volcanoes Ash Accumulations of 10 cm or more, *modified* from Scott, W.E., Iverson, R.M., Vallance, J.W., and Hildreth, W., 1995. Volcano Hazards in the Mount Adams Region, Washington: U.S. Geological Survey Open-File Report 95-492.

U.S. Army Corps of Engineers (Corps), Water Resources Support Center, Institute for Water Resources. 1991. National Economic Development Procedures Manual: Overview Manual for Conducting National Economic Development Analysis. IWR Report 91-R-11. October 1991.

U.S. Army Corps of Engineers (Corps). 2006. Upper Columbia Alternative Flood Control and Fish Operations Columbia River Basin Final Environmental Impact Statement. Obtained

- online August 16, 2006 from website:  
[http://www.nws.usace.army.mil/Template/Display/More\\_Hot\\_Topics.cfm?recno=56](http://www.nws.usace.army.mil/Template/Display/More_Hot_Topics.cfm?recno=56).
- U.S. Army Corps of Engineers, Water Resources Support Center, Institute for Water Resources. 1991. National Economic Development Procedures Manual: Overview Manual for Conducting National Economic Development Analysis. IWR Report 91-R-11. October 1991.
- U.S. Army Corps of Engineers. 2006a. *Ice Harbor Lock and Dam*. Obtained August 15, 2006, from website: [http://www.nww.usace.army.mil/dpn/dpn\\_project.asp?project\\_id=59](http://www.nww.usace.army.mil/dpn/dpn_project.asp?project_id=59)
- U.S. Army Corps of Engineers. 2006b. *Lower Monumental Lock and Dam*. Obtained August 15, 2006, from website:  
[http://www.nww.usace.army.mil/dpn/dpn\\_project.asp?project\\_id=92](http://www.nww.usace.army.mil/dpn/dpn_project.asp?project_id=92)
- U.S. Army Corps of Engineers. 2006c. *Columbia River Power Complex Online Brochure*. Obtained August 15, 2006, from website:  
[https://www.nwp.usace.army.mil/op/b/docs/brochures/Col\\_River\\_Power\\_complex.pdf](https://www.nwp.usace.army.mil/op/b/docs/brochures/Col_River_Power_complex.pdf)
- U.S. Bureau of Reclamation (Reclamation), Bonneville Power Administration, and U.S. Army Corps of Engineers (Action Agencies). 2004. Final Updated Proposed Action for the FCRPS Biological Opinion Remand. November 24, 2004.
- U.S. Bureau of Reclamation (Reclamation). 2006c. Initial Alternative Development and Evaluation. Odessa Subarea Special Study, Columbia Basin Project, Washington. September 2006.
- U.S. Bureau of Reclamation (Reclamation). 2006e. *Plan of Study. Supplemental Feed Route for Potholes Reservoir*. Columbia Basin Project. May 2006.
- U.S. Bureau of Reclamation (Reclamation). 1982. Columbia Basin project Water Quality. July 1982.
- U.S. Bureau of Reclamation (Reclamation). 1998. Columbia Basin Project (Second Draft). Bureau of Reclamation History Program, Denver, Colorado, Research on Historic Reclamation Projects. Obtained August 11, 2006, from website:  
<http://www.usbr.gov/dataweb/projects/washington/columbiabasin/history.html#columbia>.
- U.S. Bureau of Reclamation (Reclamation). 2006b. Chief Joseph Dam Project, Washington. Obtained August 15, 2006, from website:  
<http://www.usbr.gov/dataweb/html/chiefjoseph.html>.
- U.S. Bureau of Reclamation (Reclamation). 2006d. Odessa Subarea Special Study Columbia Basin Project Plan of Study. February 2006.
- U.S. Bureau of Reclamation(Reclamation). 2006a. Grand Coulee Dam.  
<http://www.usbr.gov/dataweb/dams/wa00262.htm> 2006. Obtained August 15, 2006.

- U.S. Department of Agriculture, National Agricultural Statistics Service (USDA). 2004. 2002 Census of Agriculture: State Summary Highlights. June. Obtained December 18, 2006, from <http://www.nass.usda.gov/census/census02/volume1/wa/index2.htm>.
- U.S. Department of Commerce, Bureau of Economic Analysis (BEA). 2006. Local Area Personal Income. Tables CA1-3, CA25, and CA45. [http://www.bea.gov/bea/regional/reis/].
- U.S. Department of Transportation (USDOT). 2000. Washington Fast Facts 2000. Bureau of Transportation Statistics. Obtained on August 1 from website: [http://www.bts.gov/publications/state\\_transportation\\_profiles/washington/html/fast\\_facts.html](http://www.bts.gov/publications/state_transportation_profiles/washington/html/fast_facts.html).
- U.S. Environmental Protection Agency (EPA). 2002b. Columbia/Snake Rivers Temperature TMDL Preliminary Draft September 13, 2002. Obtained December 18, 2006, from website: <http://yosemite.epa.gov/R10/WATER.NSF/ac5dc0447a281f4e882569ed0073521f/9d61ce85bbbd93ba88256c3300601055?OpenDocument>
- U.S. Environmental Protection Agency (EPA). 2005. Columbia/Snake River Mainstem TMDL. Obtained August 11, 2006, from website: <http://yosemite.epa.gov/R10/WATER.NSF/ac5dc0447a281f4e882569ed0073521f/5ea7af703639a1f788256a3000764938!OpenDocument>.
- U.S. Environmental Protection Agency (EPA). 2006. National Air Quality and Emissions Trends Report, 2003. Obtained from website: [http://www.epa.gov/airtrends/non\\_table.pdf](http://www.epa.gov/airtrends/non_table.pdf) September 5, 2006.
- U.S. Environmental Protection Agency (EPA). 2002a. Columbia River Fish Contaminant Survey 1996-1998. December 18, 2006, from website: <http://yosemite.epa.gov/R10/OEA.NSF/webpage/Columbia+River+Basin+Fish+Contaminant+Survey>.
- U.S. Fish and Wildlife and U.S. Department of Commerce, Bureau of the Census (USFWS and US Census). 2003. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. March. Obtained December 15, 2006, from <http://www.census.gov/prod/2003pubs/01fhw/fhw01-wa.pdf>.
- U.S. Fish and Wildlife Service (USFWS). 1982. Management of Seasonally Flooded Impoundments for Wildlife. Authors Leigh H. Fredrickson and T. Scott Taylor. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Resource Publication 148.
- U.S. Fish and Wildlife Service (USFWS). 1985-1989. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed on August 7, 2006 from website: <http://www.fws.gov/nwi/>.

- U.S. Fish and Wildlife Service (USFWS). 1998. Bull Trout, *Salvelinus confluentus*. <http://training.fws.gov/library/pubs/bulltrt.pdf> . November 1998.
- U.S. Fish and Wildlife Service (USFWS). 2003a. Frequently Asked Questions About Proposed Critical Habitat. [http://pacific.fws.gov/bulltrout/q&a\\_crithab.pdf](http://pacific.fws.gov/bulltrout/q&a_crithab.pdf).
- U.S. Fish and Wildlife Service (USFWS). 2003b. Proposed Critical Habitat. <http://pacific.fws.gov/bulltrout/criticalhab.htm>.
- U.S. Fish and Wildlife Service (USFWS). 2004. Recovery Outline for the Columbia Basin Distinct Population Segment of the Pygmy Rabbit (*Brachylagus idahoensis*). Upper Columbia Fish and Wildlife Office, Spokane, Washington.
- U.S. Fish and Wildlife Service (USFWS). 2005a. Endangered, Threatened, Proposed, Candidate, and Species of Concern, and designated Critical Habitat, in the Upper Columbia Fish and Wildlife Office area of responsibility in eastern Washington State and northern Idaho. (Revised December 12, 2005). <http://www.fws.gov/easternwashington/documents/UCFWO%20listed-candidate%20spp.pdf>.
- U.S. Fish and Wildlife Service (USFWS). 2005b. Lists of Endangered, Threatened, Proposed, Candidate, and Species of Concern, in Wahkiakum County, Cowlitz County, Clark County, and Skamania County. Revised December 20, 2005.
- U.S. Fish and Wildlife Service (USFWS). 2006. Columbia National Wildlife Refuge overview. Accessed on August 7, 2006 from website: <http://www.fws.gov/refuges/profiles/index.cfm?id=13510>.
- U.S. Fish and Wildlife Service (USFWS). 2006. Draft Hanford Reach National Monument Comprehensive Conservation Plan and Environmental Impact Statement. Richland, Washington.
- U.S. Geologic Survey (USGS). 2002a. Columbia River Basin Washington. U.S. Geological Survey Website. Obtained August 11, 2006, from website: [http://vulcan.wr.usgs.gov/Volcanoes/Washington/ColumbiaRiver/description\\_columbia\\_river.html](http://vulcan.wr.usgs.gov/Volcanoes/Washington/ColumbiaRiver/description_columbia_river.html).
- U.S. Geological Survey (USGS). 2002b. Water Resources Data, Washington Water Year 2002. Water-Data Report WA-02-1, 577 pages.
- U.S. Geological Survey (USGS). 2006a. Central Columbia Plateau – Yakima River Basin. U.S. Geological Survey Website. Obtained August 15, 2006, from website: <http://wa.water.usgs.gov/projects/ccyk/>.
- U.S. Geological Survey (USGS). 2006b. Description: Columbia Plateau; Columbia River Basalt. Accessed August 16, 2006 from USGS web site: [http://vulcan.wr.usgs.gov/Volcanoes/ColumbiaPlateau/description\\_columbia\\_plateau.html](http://vulcan.wr.usgs.gov/Volcanoes/ColumbiaPlateau/description_columbia_plateau.html).

- U.S. Geological Survey (USGS). 2006c. Lake Roosevelt-Upper Columbia River. Obtained from web page: <http://wa.water.usgs.gov/projects/roosevelt/> on August 16, 2006.
- U.S. Geological Survey (USGS). 2006d. Largest Earthquake in Washington, Near Lake Chelan, Washington, 1872 12 15 05:40 UTC (local (12/14), Magnitude 7.3: Large Earthquakes in the United States, Earthquake Hazards Program, accessed August 16, 2006 from USGS web site: [http://earthquake.usgs.gov/regional/states/events/1872\\_12\\_15.php](http://earthquake.usgs.gov/regional/states/events/1872_12_15.php).
- U.S. Geological Survey (USGS). 2006e. Quaternary fault and fold database for the United States, accessed August 16, 2006, from USGS web site: <http://earthquake.usgs.gov/regional/qfaults/>.
- U.S. Geological Survey (USGS). 2006f. Water Data for the Nation. <http://waterdata.usgs.gov/nwis/>. Accessed August 7, 2006.
- U.S. Water Resources Council. 1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. March 10, 1983.
- U.S. Water Resources Council. 1983. Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. March 10, 1983.
- Vander Haegen, W. M., F. C. Dobler, and D. J. Pierce. 2000. Shrub steppe bird response to habitat and landscape variables in eastern Washington, USA. *Conservation Biology* 14:1145-1160.
- Vander Haegen, W. M., M. A. Schroeder, S. S. Germaine, S. D. West, and R. A. Gitzen . 2005. Wildlife on Conservation Reserve Program lands and native shrubsteppe in Washington: Progress Report for 2004. Washington Department of Fish and Wildlife, Olympia. 51pp.
- Vander Haegen, W. M., S. M. McCorquodale, C. R. Peterson, G. A. Green, and E. Yensen. 2001. Wildlife communities of eastside shrubland and grassland habitats. *In* Wildlife-habitat relationships in Oregon and Washington (D. H. Johnson and T. A. O'Neil, eds). Oregon State University Press, Covallis. 768p.
- Volkman, J. M. 1997. A river in Common: The Columbia River, the Salmon Ecosystem, and Water Policy. A Report to the Western Water Policy Review Advisory Commission. Springfield, VA: National Technical Information Service.
- Wagner, Richard J., Lonna M. Frans, and Raegan M. Huffman. 2006. [Occurrence, Distribution, and Transport of Pesticides in Agricultural Irrigation-Return Flow from Four Drainage Basins in the Columbia Basin Project, Washington, 2002-04, and Comparison with Historical Data](#). U.S. Geological Survey Scientific Investigations Report 2006-5005.
- Walker, Deward E. Jr. (editor). 1998. *Plateau*. Handbook of North American Indians, Vol. 12, William C. Strurtevant, general editor, Smithsonian Institution, Washington, D.C.
- Walsh, T.J., and Logan, R.L. 1989. Land Subsidence in Washington: in Engineering Geology in Washington, Volume I, Washington Division of Geology and Earth Resources Bulletin 78, pp. 121-134.

- Washington Department of Fish and Wildlife (WDFW). 1997. Nature Mapping for Fish and Streams, a Citizens Guide to Stream Monitoring and Restoration. January 1997.
- Washington Department of Fish and Wildlife (WDFW). 1998. Management Recommendations for Washington's Priority Habitats: Riparian, Executive Summary.
- Washington Department of Fish and Wildlife (WDFW). 2000. Wildlife Areas and Access Points. Accessed on August 4, 2006 from website:  
<http://wdfw.wa.gov/lands/wildarea.htm>.
- Washington Department of Fish and Wildlife (WDFW). 2000-2001. Pacific Salmon and Wildlife: Ecological Contexts, Relationships, and Implications for Management.  
<http://www.wa.gov/wdfw/hab/salmonwild/>.
- Washington Department of Fish and Wildlife (WDFW). 2001. Washington State Fishing Guide,  
<http://www.wa.gov/wdfw/outreach/fishing/wfg2001/wfgsport.htm>.
- Washington Department of Fish and Wildlife (WDFW). 2006. Priority Habitats and Species List.
- Washington Department of Fish and Wildlife (WDFW). 1995. Washington State Recovery Plan for the Pygmy Rabbit. Wildlife Management Program, Washington Department of Fish and Wildlife, Olympia, Washington.
- Washington Department of Fish and Wildlife (WDFW). 2003. Washington Pygmy Rabbit 2003 Recovery Plan Update. Addendum to Washington State Recovery Plan for the Pygmy Rabbit (1995). Wildlife Management Program, Washington Department of Fish and Wildlife, Olympia, Washington.
- Washington State Department of Community, Trade and Economic Development, Office of Financial Management, Department of Agriculture, Department of Ecology, and Employment Security Department. 2005. "Questions and Answers Concerning Economic Impacts of the Drought in Washington State. June 2005. Obtained August 21, 2006, from website:  
[http://www.co.snohomish.wa.us/documents/County\\_Services/FocusOnFarming/econimpactQA2005.pdf](http://www.co.snohomish.wa.us/documents/County_Services/FocusOnFarming/econimpactQA2005.pdf).
- Washington State Department of Ecology (Ecology) and the National Oceanic and Atmospheric Administration (NOAA). 2001. Managing Washington's Coast, Washington's Coastal Zone Management Program. Publication 00-06-029. February 2001.
- Washington State Department of Ecology (Ecology) and U.S. Bureau of Reclamation (Reclamation). 2005. Columbia River Mainstem Storage Options, Washington. Off-Channel Storage Assessment Pre-Appraisal Report. Prepared by MWH. December 2005.

- Washington State Department of Ecology (Ecology) and Washington Department of Fish and Wildlife (WDFW). 2004a. *Draft Environmental Impact Statement: Columbia River Initiative*. December 2004.
- Washington State Department of Ecology (Ecology) and Washington Department of Fish and Wildlife (WDFW). 2004b. *Draft Environmental Impact Statement: Columbia River Mainstem Water Management Program*. Ecology Publication Number 04-11-031. December 2004.
- Washington State Department of Ecology (Ecology), 2006c. Moses Lake Phosphorus-Response Model and Recommendations to Reduce Phosphorus Loading. Publication No. 06-03-011. June 2006.
- Washington State Department of Ecology (Ecology). 1995. *Ecology v. Acquavella*. Memorandum Opinion Re: Subbasin 8 Exceptions of Ivan and Mildred Hutchison, Court Claim No, 0876, and Vernon G. and Ellen F. Meyer, Court Claim No. 1875; Theiline Scheumann & Grousemont Farm, Claim No. 1335. January 31, 1995. Document No. 10,304.
- Washington State Department of Ecology (Ecology). 1995. Watershed Briefing Paper for the Upper and Lower Snake River Water Quality Management Area. Ecology Publication No. 95-346. September 1995.
- Washington State Department of Ecology (Ecology). 1996. *Ecology v. Acquavella*. Memorandum Opinion Re: Return Flow Exceptions of Harry Masterson and Mary Lou Masterson, Claim No. 01467 and (A) 03296, Subbasin No. 3. July 16, 1996. Document No. 11,813.
- Washington State Department of Ecology (Ecology). 1996a. Watershed Briefing Paper for the Mid-Columbia Basin Watershed. Ecology Publication No. 96-337. September 1996.
- Washington State Department of Ecology (Ecology). 1996b. Wetland Stewardship. <http://www.ecy.wa.gov/programs/sea/pubs/96-120/961201.html>.
- Washington State Department of Ecology (Ecology). 1997. Ground Water in Washington State. Prepared in cooperation with the Washington State Interagency Ground Water Committee. Publication No. WQ-96-07. March 1997.
- Washington State Department of Ecology (Ecology). 1998a. How Ecology Regulates Wetlands. Publication Number 97-112.
- Washington State Department of Ecology (Ecology). 1998b. The 303(d) List of Impaired and Threatened Waterbodies, 1998 List. <http://www.ecy.wa.gov/programs/wq/303d/1998/1998-index.html> . 2002.
- Washington State Department of Ecology (Ecology). 2000. *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution*, Appendix A, Washington Department of Ecology Publication No. 99-26, January 2000.

- Washington State Department of Ecology (Ecology). 2003a. Designating Waters for Native Char Protection, Proposal for Protecting the Spawning and Early Juvenile Tributary Rearing of Char. [http://www.ecy.wa.gov/programs/wq/swqs/bull\\_trout/early\\_trib.html](http://www.ecy.wa.gov/programs/wq/swqs/bull_trout/early_trib.html).
- Washington State Department of Ecology (Ecology). 2003b. *Final Environmental Impact Statement for Watershed Planning under Chapter 90.82 RCW*. Publication No. 03-06-013. July 18, 2003.
- Washington State Department of Ecology (Ecology). 2003c. Moses Lake Total Maximum Daily Load Study. Ecology Publication No. 03-03-005. February 2003.
- Washington State Department of Ecology (Ecology). 2003d. Restoring Wetlands in Washington, A Guidebook for Wetland Restoration, Planning, and Implementation. Publication No. 93-17. 2003.
- Washington State Department of Ecology (Ecology). 2004a. *An Evaluation of Probable Benefits and Costs for the Proposed Rule to Establish the Columbia River Water Resources Management Program*. Prepared by Shidong Zhang. Ecology Publication No. 04-11-032. December 2004.
- Washington State Department of Ecology (Ecology). 2004b. *Draft Environmental Impact Statement: Columbia River Mainstem Water Management Program*. December 2004.
- Washington State Department of Ecology (Ecology). 2004c. *Small Business Economic Impact Statement Proposed Columbia River Water Management Program Rule*. Ecology Publication No. 04-11-028. December 2004.
- Washington State Department of Ecology (Ecology). 2005a. Determining Irrigation Efficiency and Consumptive Use. GUID-1210. November 11, 2005.
- Washington State Department of Ecology (Ecology). 2005b *Final Programmatic Environmental Impact Statement For The Ahtanum Creek Watershed Restoration Program*. Publication #05-06-016. June 2005.
- Washington State Department of Ecology (Ecology). 2005c. 2004 Water Quality Assessment (Final) – Category 5 Listings. Wednesday, November 2, 2005. Obtained August 11, 2006, from website: [http://www.ecy.wa.gov/programs/wq/303d/2002/2004\\_documents/wria\\_pdfs-5final/kk-active-5.pdf](http://www.ecy.wa.gov/programs/wq/303d/2002/2004_documents/wria_pdfs-5final/kk-active-5.pdf).
- Washington State Department of Ecology (Ecology). 2006a. Columbia River Facts and Maps. Obtained August 11, 2006, from website: <http://www.ecy.wa.gov/programs/wr/cwp/cwpfactmap.html>.
- Washington State Department of Ecology (Ecology). 2006b. 2005 Drought Response: Report to the Legislature. Obtained August 22, 2006 from website: <http://www.ecy.wa.gov/biblio/0611001.html>. February 2006.

- Washington State Department of Ecology (Ecology). 2003. Mitigation Measures Used in Water Right Permitting. April 2003.
- Washington State Department of Natural Resources (DNR). 2001. The Geology of Washington modified from Lasmanis, Raymond, 1991, The Geology of Washington: Rocks and Minerals, v. 66, no. 4, p. 262-277. Obtained August 11, 2006, from website: <http://dnr.wa.gov/geology/geolofwa.htm>.
- Washington State Joint Natural Resources Cabinet (WSJNRC). 1999. Extinction is not an Option, Statewide Strategy to Recover Salmon. September 1999.
- Washington State Office of Archeology and Historic Preservation (OAHP). 2002. Archeological and Historic Site Records. <http://www.oahp.wa.gov/records.htm>.
- Washington State Office of Community Development (OCD). 2002. About Environmental Review. <http://www.oed.wa.gov/info/lgd/oahp/envir.htm>.
- Washington State Office of Financial Management (OFM). 2006. Rank of Cities and Towns by April 1, 2006 Population Size. Published April 1, 2006. Obtained from website <http://www.ofm.wa.gov/pop/april1/rank2006.pdf> on August 21, 2006.
- Washington State Office of Trade and Economic Development (OTED). 2001. Convergence: Natural Gas and Electricity in Washington. May 2001. Available at <http://www.efsec.wa.gov/Sumas2/adj2001/cfeprefiled/jl-6.pdf>, accessed on August 2, 2006.
- Washington State University (WSU), Remote Sensing and GIS Lab, Crop and Soil Science. 2006. Obtained July 28, 2006, from website: <http://remotesens.css.wsu.edu/washingtonsoil/>.
- Weaver, C.S. and Shedlock, K.M. 1996. Estimates of Seismic Source Regions from the Earthquake Distribution and Regional Tectonics in the Pacific Northwest: U.S. Geological Survey Professional Paper 1560, pp. 285-306.
- Whitehead, R.L. 1994. Ground Water Atlas of the United States, Idaho, Oregon, Washington, HA-730H. U.S. Geological Survey Publication. Obtained August 11, 2006, from website: [http://capp.water.usgs.gov/gwa/ch\\_h/index.html](http://capp.water.usgs.gov/gwa/ch_h/index.html).
- Williams, G.W. and O. Capps, Jr. 2005. An Assessment of Future markets for Crops Grown Along the Columbia River: Economic Implications of Increases in Production Resulting from New Agricultural Water Rights Under the Columbia River Initiative. September 2005.
- Williamson, A.K., Munn, M.D., Ryker, S.J., Wagner, R.J., Ebbert, J.C., and Vanderpool, A.M. 1998. Water Quality in the Central Columbia Plateau, Washington and Idaho, 1992-95: U.S. Geological Survey Circular 1144. Obtained August 11, 2006, from website: <http://water.usgs.gov/pubs/circ1144>, updated March 3, 1998.

- Willis, D.B. and Whittlesey N.K. 1998. "The Effects of Stochastic Irrigation Demands and Surface Water Supplies on On-Farm Water Management." *Journal of Agricultural and Resource Economics* 23: 206-224.
- Wilma, David. *Stevens, Isaac Ingalls (1818-1865)*. 2003. Obtained August 16, 2006, from website: [http://www.historylink.org/essays/output.cfm?file\\_id=5314](http://www.historylink.org/essays/output.cfm?file_id=5314)
- Wines. J. Irrigation Transformed the Desert. Washington State Employment Security Department. No date. Obtained August 17, 2006, from website: [http://www.workforceexplorer.com/admin/uploadedPublications/5078\\_IRRIGATION.pdf#search=%22wines%20%22irrigation%20transformed%20the%20desert%22%22](http://www.workforceexplorer.com/admin/uploadedPublications/5078_IRRIGATION.pdf#search=%22wines%20%22irrigation%20transformed%20the%20desert%22%22).
- Wooten, George. 2002. Shrub-steppe Conservation Prioritization in Washington State. Prepared for Kettle Range Conservation Group. Spokane, Washington. 21 pp.
- Wy-Kan-Ush-Mi Wa-Kish-Wit; Spirit of the Salmon*. The Columbia River Anadromous Fish Plan of the Nez Pierce, Umatilla, Warm Springs and Yakama Tribes, Volume 1. Columbia River Intertribal Fish Commission, 1995. Printed July 1996. Available on-line at : <http://www.critfc.org/text/trp.html>
- Yeats, R.S., Sieh, K, and Allen, C.R. 1997. *The Geology of Earthquakes*: Oxford University Press, New York, NY, 568 pp.
- Zhang, S. 2004. An Evaluation of Probable Benefits and Costs for the Proposed Rule to Establish the Columbia River Water Resources Management Program. Washington State Department of Ecology No. 04-11-032. December 2004.

**Personal Communications:**

- Blanchard, James. 2006. Special Projects Officer, Bureau of Reclamation. Personal communication. Email correspondence with Robert Montgomery, Montgomery Water Group, regarding the hydrologic analysis for the supplemental feed routes for Potholes Reservoir, August 23, 2006.
- Cook, Dave. 2004. Yakima County Auditor. Yakima County. Personal communication with Richard Mack, Ph.D., Central Washington University. December 27, 2004. Cited in *Final Programmatic Environmental Impact Statement For The Ahtanum Creek Watershed Restoration Program*. Publication #05-06-016. June 2005.
- Hoff, Gina. 2006. Personal communication. U.S. Bureau of Reclamation. August 23, 2006.
- Slattery, Ken. 2002. Personal communication, Washington State Department of Ecology, email subject CSRIA Settlement/probability of regulation under existing rule. December 2, 2002.

U.S. Bureau of Reclamation, 2007. Personal communication, January 3, 2007. Email from Donna Postma regarding acreage within Columbia Basin Project.

Washington State Department of Ecology (Ecology). 2006. Personal communication, August 9, 2006. Email from Ron Dixon, Preliminary data on interruptible water rights within 1 mile of the Columbia River.

Watson, Mike 2007. Personal communication, January 5, 2007. Email correspondence with Mike Watson, PE, Confederated Tribes, regarding the Confederated Tribes of the Colville Reservation—Bonneville Power Administration agreement on hydropower annual payments.

Yu, Pei-Lin. 2006. Archaeologist, U.S. Bureau of Reclamation, Boise. Personal communication with Paula Johnson, Paragon Research Associates, telephone conversation regarding drawdown of Lake Roosevelt. August 24, 2006.

## CHAPTER 8.0 DISTRIBUTION LIST

Gary Chandler, VP Gov't Affairs  
Association of Washington Business  
1414 Cherry St. SE  
Olympia, WA 98507

Cindy Custer  
Constituent Account Executive  
Bonneville Power Administration  
924 Capitol Way S  
Olympia, WA 98501

Rick George, Program Manager  
Environ. Planning and Right Protection-  
Umatilla Tribes  
P.O. Box 638  
Pendleton, OR. 97801

Bob Hammond, City Manager  
City of Kennewick  
210 W. Sixth Ave  
P.O. Box 6108  
Kennewick, WA 99336-0108

Mo McBroom, Policy Director  
WA Environmental Council  
615 2nd Ave, Suite 380  
Seattle, WA 98104

Gary Passmore  
Environmental Trust Director  
Colville Tribes  
P.O. Box 150  
Nespelem, WA 99155

Phil Rigdon, Natural Resources Director  
Yakama Nation  
P.O. Box 151  
Toppenish, WA 98948

Peggy Miller  
WA Dept. of Fish & Wildlife  
600 Capitol Way North  
Olympia, WA 98501

Kathleen Collins, Lobbyist  
Water Policy Alliance  
3905 Lakehills Drive SE  
Olympia, WA 98501

Dick Erickson, Manager  
East Columbia Basin Irrigation District  
P.O. Box E  
Othello, WA 99344

Bill Gray, Manager  
Ephrata District Office  
US Bureau of Reclamation  
32 "C" Street NW  
Ephrata, WA 98823

Joe Lukas, Assistant General Manager  
Ross Hendrick  
Grant County PUD  
P.O. Box 878  
Ephrata, WA 98823

Darryll Olsen, Board Representative  
Columbia-Snake Rivers Irrigation Assoc.  
3030 W Clearwater, Suite 205-A  
Kennewick, WA 99336

Lisa Pelly, Executive Director  
Washington Rivers Conservancy  
103 Palouse, Suite 33  
Wenatchee, WA 98801

Mike Schwisow, Lobbyist  
Columbia Basin Development League  
606 Columbia St. NW, Suite 101  
Olympia, WA 98501

Chris Parsons  
WA Dept. of Fish & Wildlife  
1550 Alder Street  
Ephrata, WA 98823

Jon Culp  
Irrigation Efficiencies Prog Coordinator  
WA State Conservation Commission  
921 Murry St  
Okanagon, WA 98840

Jim Fredericks  
Columbia River Representative  
US Army Corps of Engineers  
220 NW 8th Ave.  
Portland, OR. 97209

Tony Grover  
Subbasin Contract Manager  
NW Power and Conservation Council  
110 Y St.  
Vancouver, WA 98661

Rob Masonis, Regional Director  
American Rivers  
4005 20th Ave. W. Suite 221  
Seattle, WA 98199

Merrill Ott, Commissioner  
Stevens Co. Commission  
215 S. Oak St.  
Colville, WA 99114

Rudy Peone, Natural Resources Dir.  
Spokane Tribe  
6208 Ford/Wellpinit Road  
P.O. Box 100  
Wellpinit, WA 99040

Teresa Scott, Policy Analyst  
WA Department of Fish & Wildlife  
600 Capitol Way North  
Olympia, WA 98501

Ron Walter  
Chelan County  
400 Douglas Street  
Wenatchee, WA 98801

John Stuhlmiller  
Asst. Director of Gov't Relations  
Washington State Farm Bureau  
1011 10th Avenue S.E.  
Olympia, WA 98501

Paul Wagner  
NOAA Fisheries, Hydro Program  
US Dept. of Commerce--NOAA Fisheries  
1201 NE Lloyd Blvd. Suite 1100  
Portland, OR. 97232-2737

Gerry O'Keefe  
Policy Advisor  
Department of Ecology  
PO Box 47600  
Olympia, WA 98504

Derek Sandison  
Regional Director  
Department of Ecology  
15 West Yakima Ave., Suite 200  
Yakima, WA 98902

Elizabeth McManus  
Ross & Associates Environ. Consulting  
606 Columbia Street NW  
Suite 212, Office 211  
Olympia, WA 98501

Dan Silver  
606 Columbia St. NW, Suite 212  
Olympia, WA 98501

County Commissioners  
Adams County  
210 W Broadway  
Ritzville, WA 99169

County Commissioners  
Asotin County  
135 2nd St.  
Asotin, WA 99402

Max Benitz, Commissioner  
Benton County  
620 Market St.  
Prosser, WA 99350

County Commissioners  
Chelan County  
350 Orondo Ave.  
Wenatchee, WA 98801

County Commissioners  
Columbia County  
341 E. Main St.  
Dayton, WA 99328-1361

County Commissioners  
Douglas County  
213 Rainier  
Waterville, WA 98858

County Commissioners  
Ferry County  
350 E. Delaware  
Republic, WA 99166

County Commissioners  
Franklin County  
1016 N 4th Ave.  
Pasco, WA 99301

County Commissioners  
Garfield County  
PO Box 278  
Pomeroy, WA 99347

Rich Stevens, Commissioner  
Grant County  
35 C Street NW  
Ephrata, WA 98823

County Commissioners  
Kittitas County  
205 W 5th Ave.  
Ellensburg, WA 98926

County Commissioners  
Klickitat County  
205 S Columbus  
Goldendale, WA 98620

County Commissioners  
Lincoln County  
450 Logan Street  
Davenport, WA 99122

County Commissioners  
Okanogan County  
149 3rd N  
Okanogan, WA 98840

County Commissioners  
Pend Oreille County  
625 W 4th  
Newport, WA 99156

County Commissioners  
Skamania County  
PO Box 790  
Stevenson, WA 98648-0790

County Commissioners  
Spokane County  
W 1116 Broadway  
Spokane, WA 99260

County Commissioners  
Stevens County  
215 S Oak St.  
Colville, WA 99114

County Commissioners  
Walla Walla County  
315 W Main St.  
Walla Walla, WA 99362

County Commissioners  
Whitman County  
400 N Main  
Colfax, WA 99111

County Commissioners  
Yakima County  
128 N 2nd St.  
Yakima, WA 98901

Rob Masonis  
American Rivers  
4005 20th Ave West Ste 221  
Seattle, WA 98199

Robert T Rew.  
Avista Utility  
PO Box 587  
Othello, WA 99344

Big Bend Bass Masters  
1013 Oregon Street  
Moses Lake, WA 98837

William Riley  
Big Bend Economic Dev. Council  
410 W 3rd Ave Ste E  
Moses Lake, WA 98837

Big Bend Electric Co-op  
PO Box 348  
Ritzville, WA 99169-0348

Black Sands Irrigation District  
PO Box 432  
Ephrata, WA 98823

Cindy Custer  
Bonneville Power Administration  
Federal Hydro Projects – PGF 6  
PO Box 3621  
Portland, OR 97208

Bonneville Power Administration -PGP  
PO Box 3621  
Portland, OR 97208

Bonneville Power Admin. -PGP-5  
PO Box 3621  
Portland, OR 97208

Bureau of Indian Affairs  
The Federal Bldg  
911 NE 11th Ave  
Portland, OR 97232

Bureau of Indian Affairs  
1849 C St NW Ms 4513  
Washington, DD 20240

Bureau of Indian Affairs Environ  
Services Division 2  
1849 C St NW Ms-4516 Mib  
Washington, DC 20240

Shirley Nixon & Patrick Williams  
Center For Environ Law & Policy  
2400 N 45th #101  
Seattle, WA 98103

Steve Frazier  
Central Basin Audubon Society  
PO Box 86  
Moses Lake, WA 98837

Central Washington Bass Club  
1721 Methow Street  
Wenatchee, WA 98801

Karen Wagner  
Chamber of Commerce  
324 South Pioneer Way  
Moses Lake, WA 98837

Chelan County Planning Dept.  
411 Washington St  
Wenatchee, WA 98801

City of Connell  
PO Drawer 1200  
Connell, WA 99326

City of Coulee City  
P.O. Box 398  
Coulee City, WA 99115

City of Electric City  
P.O. Box 130  
Electric City, WA 99123

Bob Witkowski  
City of Ellensburg  
414 N Main St  
Ellensburg, WA 98926

City of Ephrata  
L21 Alder Street  
Ephrata, WA 98823

City of Grand Coulee  
P.O. Box 180  
Grand Coulee, WA 99133

Rick White  
City of Kennewick  
PO Box 6108  
Kennewick, WA 99336

Gilbert Alvarado  
City of Moses Lake  
PO Box 1579  
Moses Lake, WA 98837

David Mcdonald  
City of Pasco  
PO Box 293  
Pasco, WA 99301

Rick Simon  
City of Richland  
PO Box 190  
Richland, WA 99352

Dave Nakagawara  
City of Spokane  
West 808 Spokane Falls Blvd  
Spokane, WA 99201

Linda Kasting  
City of Walla Walla  
PO Box 478  
Walla Walla, WA 99362

City of Wenatchee  
PO Box 388  
Wenatchee, WA 98807

Coeur d'Alene Tribe  
PO Box 408  
Plummer, ID 83851

Alice Parker  
Columbia Basin Development League  
PO Box 1235  
Royal City, WA 98837

Mike Schwisow  
Columbia Basin Dev. League  
1336 Wilson St Ne  
Olympia, WA 98506

Columbia Basin Environmental Council  
P.O. Box 1285  
Soap Lake, WA 98551

Columbia County  
114 South Second St  
Dayton, WA 99328

Rachael P.Osborn  
Columbia Institute for Water Policy  
2421 W. Mission  
Spokane, WA 99201

Julie A. Carter  
Columbia River Inter-Tribal Fish Comm.  
729 Ne Oregon St, Ste 200,  
Portland, OR 97232

Gary Passmore  
Colville Confederated Tribes  
PO Box 150  
Nespelem, WA 99155

Steve Suagee  
Colville Confederated Tribes  
PO Box 150  
Nespelem, WA 99155

Rick George  
Confederated Tribes of  
The Umatilla Indian Reservation  
PO Box 638  
Pendleton, OR 97801

Patty O'Toole  
Confederated Tribes of  
The Warm Springs Reservation  
PO Box C  
Warm Springs, OR 97761

Jim Fredricks  
Corps of Engineers Portland Dist.  
PO Box 2870  
Portland, OR 97232

Cultural Resources Spokane Tribe of Indians  
PO Box 100  
Wellpinit, WA 99040

Linda Crerar  
Dept of Agriculture  
PO Box 42560  
Olympia, WA 98504

Teresa Scott  
Dept of Fish & Wildlife  
PO Box 43200  
Olympia, WA 98504

Dept of Transportation  
PO Box 47330  
Olympia, WA 98504

Big Bend Economic Council  
226 W. Third Ave  
Moses Lake, WA 98837

Mark Kulaas  
Douglas County  
140 19th Street NW Ste A  
East Wenatchee, WA 98802

Dick Erickson  
East Columbia Basin Irrigation District  
P.O. Box E  
Othello, WA 99344

Environmental Protection Agency  
Geographic Implementation Unit Region 10  
ECO-088  
1200 Sixth Ave.  
Seattle, WA 98101

Mark Nielson  
Franklin Conservation District  
1620 Road 44  
Pasco, WA 99301

Grant County Planning Dept  
PO Box 37  
Ephrata, WA 98823

Christopher W Hesse  
Grant County Farm Bureau  
480 N Frontage Rd E  
Moses Lake, WA 98837

Grant County Port District No. 4  
P.O. Box 537  
Coulee City, WA 99115

Grant County Port District No. 7  
P.O. Box 616  
Grand Coulee, WA 99133

Joe Luka  
Grant County Public Utility District  
P.O. Box 878  
Ephrata, WA 98823

Idaho Dept of Environ. Quality  
1401 N Hilton  
Boise, ID 83706

Idaho Rivers United  
PO Box 633  
Boise, ID 83701

Curt Dreyer  
Klickitat County  
228 West Main St MS – Ch-17  
Goldendale, WA 98620

Kootenai Tribes of Idaho  
PO Box 1269  
Bonners Ferry, ID 83805

Moses Lake Irrigation and  
Rehabilitation District  
PO Box 98  
Moses Lake, WA 98837

Dale Bambrick  
National Marine Fisheries Service  
304 S. Water St #200  
Ellensburg, WA 98926

Jaime Pinkham  
Nez Perce Tribe  
3404 Hwy 12  
Orofino, ID 83544

Nez Perce Tribe  
PO Box 365  
Lapwai, ID 83540

Dennis Conley  
Northwest Food Processors Association  
4 Pelican Place  
Moses Lake, WA 98837

Craig Smith  
Northwest Food Processors Assoc.  
9700 SW Capitol Hwy Ste 250  
Portland, OR 97219

Tony Grover  
Northwest Power & Conservation Council  
851 SW Sixth Ave Ste 1100  
Portland, OR 97204

Pat Boss  
Odessa Aquifer Replenishment Coalition  
PO Box 1940  
Moses Lake, WA 98837

Dr Robert Whitlam  
Office of Archaeology and  
Historic Preservation  
PO Box 48343  
Olympia, WA 98504

Oregon Dept of Environmental Quality  
Headquarters  
811 SW 6th Ave  
Portland, OR 97204

Oregon Water Resources Dept  
725 Summer Street NE, Ste. A  
Salem, OR 97301

Pacific Fishery Management Council  
7700 NE Ambassador  
Place Ste 200  
Portland, OR 97220

Parks & Recreation Commission  
PO Box 42668  
Olympia, WA 98504

Port of Warden  
PO Box 841  
Warden, WA 98857

Andrew Glassell  
PUD - Chelan County  
PO Box 1231  
Wenatchee, WA 98801

Darvin Fales  
Quincy Columbia Basin Irrigation Dist.  
PO Box 188  
Quincy, WA 98848

Quincy Columbia Basin Irrigation Dist.  
P.O. Box 188  
Quincy, WA 98848

John Ahern  
Representative  
PO Box 40600  
Olympia, WA 98504

Mike Armstrong  
Representative  
P O Box 40600  
Olympia, WA 98504

Brian Blake  
Representative  
PO Box 40600  
Olympia, WA 98504

David Buri  
Representative  
P O Box 40600  
Olympia, WA 98504

Bruce Chandler  
Representative  
PO Box 40600  
Olympia, WA 98504

Jim Clements  
Representative  
PO Box 40600  
Olympia, WA 98504

Cary Condotta  
Representative  
P O Box 40600  
Olympia, WA 98504

Don Cox  
Representative  
P O Box 40600  
Olympia, WA 98504

Larry Crouse  
Representative  
PO Box 40600  
Olympia, WA 98504

Richard Curtis  
Representative  
PO Box 40600  
Olympia, WA 98504

Jerome Delvin  
Representative  
P O Box 40408  
Olympia, WA 98504

Jim Dunn  
Representative  
PO Box 40600  
Olympia, WA 98504

David Duvall  
Representative  
PO Box 40600  
Olympia, WA 98504

Bill Fromhold  
Representative  
PO Box 40600  
Olympia, WA 98504

Bill Grant  
Representative  
PO Box 40600  
Olympia, WA 98504

Larry Haler  
Representative  
PO Box 40600  
Olympia, WA 98504

Shirley Hankins  
Representative  
PO Box 40600  
Olympia, WA 98504

Bill Hinkle  
Representative  
PO Box 40600  
Olympia, WA 98504

Janea Holmquist  
Representative  
PO Box 40600  
Olympia, WA 98504

Joel Kretz  
Representative  
PO Box 40600  
Olympia, WA 98504

Jim Moeller  
Representative  
PO Box 40600  
Olympia, WA 98504

Daniel Newhouse  
Representative  
PO Box 40600  
Olympia, WA 98504

Ed Orcutt  
Representative  
PO Box 40600  
Olympia, WA 98504

Timm Ormsby  
Representative  
PO Box 40600  
Olympia, WA 98504

Eric Pettigrew  
Representative  
P O Box 40600  
Olympia, WA 98504

Lynn Schindler  
Representative  
PO Box 40600  
Olympia, WA 98504

John Serben  
Representative  
PO Box 40600  
Olympia, WA 98504

Mary Skinner  
Representative  
PO Box 40600  
Olympia, WA 98504

Bob Sump  
Representative  
P O Box 40600  
Olympia, WA 98504

Dean Takko  
Representative  
PO Box 40600  
Olympia, WA 98504

Deb Wallace  
Representative  
PO Box 40600  
Olympia, WA 98504

Maureen Walsh  
Representative  
P O Box 40600  
Olympia, WA 98504

Alex Wood  
Representative  
PO Box 40600  
Olympia, WA 98504

Ritzville Area  
Chamber of Commerce  
PO Box 122  
Ritzville, WA 99169

Save Our Wild Salmon  
2031 SE Belmont  
Portland, OR 97214

Potholes Bass Club  
PO Box 1155  
Moses Lake, WA 98837

Brad Benson, Senator  
PO Box 40406  
Olympia, WA 98504

Donny Benton, Senator  
PO Box 40417  
Olympia, WA 98504

Lisa Brown  
Senator  
PO Box 40403  
Olympia, WA 98504

Alex Deccio  
Senator  
PO Box 40414  
Olympia, WA 98504

Mark Doumit, Senator  
PO Box 40419  
Olympia, WA 98504

Mike Hewitt, Senator  
P O Box 40416  
Olympia, WA 98504

Jim Honeyford, Senator  
PO Box 40415  
Olympia, WA 98504

Bob Mccaslin, Senator  
PO Box 40404  
Olympia, WA 98504

BobMorton, Senator  
P O Box 40407  
Olympia, WA 98504

Joyce Mulliken, Senator  
P O Box 40413  
Olympia, WA 98504

Linda Evans Parlette, Senator  
P O Box 40412  
Olympia, WA 98504

Craig Pridemore, Senator  
PO Box 40449  
Olympia, WA 98504

Mark Schoesler, Senator  
PO Box 40409  
Olympia, WA 98504

Paull Shin, Senator  
PO Box 40421  
Olympia, WA 98504

Joseph Zarelli, Senator  
PO Box 40418  
Olympia, WA 98504

U.S. Bureau of Land Management  
Spokane District Office  
1103 N Fancher  
Spokane, WA 99212

Rudy Peone  
Spokane Tribe of Indians  
PO Box 100  
Wellpinit, WA 99040

Deanna Pavlik  
Spokane Tribe of Indians  
PO Box 100  
Wellpinit, WA 99040

Doc Hastings  
U.S. Representative  
2715 St Andrews Loop Ste D  
Pasco, WA 99301

Cathy McMorris  
U.S. Representative  
10 North Post 6th Floor  
Spokane, WA 99201

Maria Cantwell  
U.S. Senator  
717 Hart Senate Office Building  
Washington, DC 20510

United State Bureau of  
Land Management  
915 Walla Walla  
Wenatchee, WA 98801

Robert Flores  
U.S. Fish & Wildlife Service  
PO Drawer F  
Othello, WA 99344

Mark Miller, Ecological Services  
U.S. Fish & Wildlife Service,  
Central Washington Field Office  
215 Melody Lane, Suite 119  
Wenatchee, WA 98801

Patty Murray  
U.S. Senator  
402 E Yakima Ave Ste 390  
Yakima, WA 98901

Jim Petersen  
USGS/CRR1  
5501 A Cook-Underwood Rd  
Cook, WA 98605

Lou Nevsimal  
WA State Bass Federation  
Banks Lake Enhancement Project  
PO Box 6  
Wilbur, WA 99185

Rex C Crawford PhD  
Wa State Dept of Natural Res.  
WA Natural Heritage Program  
PO Box 47016  
Olympia, WA 98504

Gretchen Borck  
WA Association of Wheat Growers  
109 East First  
Ritzville, WA 99169

Barbara Ritchie  
Washington Department of Ecology  
PO Box 47703  
Olympia, WA 98504

Keith Stoffel  
Washington Department of Ecology  
4601 N Monroe St  
Spokane, WA 99205

Bill Tweit  
WA Department of Fish & Wildlife  
600 Capitol Way N  
Olympia, WA 98501

Dennis Beich  
WA Department of Fish & Wildlife, Region  
2 Office  
1550 Alder Street N.W.  
Ephrata, WA 98823

Milt Johnston  
WA Dept of Natural Resources  
713 E Bowers Rd  
Ellensburg, WA 98926

Mo McBroom  
WA Environmental Council  
615 Second Ave Ste 380  
Seattle, WA 98104

Washington State Parks  
PO Box 370  
Electric City, WA 99123

Mark C Schulz  
WA State Parks & Recreation Comm  
Eastern WA Resources Dev  
2201 North Duncan Drive  
Wenatchee, WA 98801

Chris Voigt  
Washington State Potato Commission  
108 Interlake Rd  
Moses Lake, WA 98837

Tom Myrum  
Washington State Water Resources Assoc  
606 Columbia St Nw Ste 100  
Olympia, WA 98501

Johnson Meninick  
Yakama Nation Cultural Resources  
PO Box 151  
Toppenish, WA 98948

Philip Rigdon  
Yakama Nation Natural Res. Division  
PO Box 151  
Toppenish, WA 98948

Tom Ring  
Yakama Nation Water Res. Program  
PO Box 151  
Toppenish, WA 98948

Agnes Katchen  
Yakama Nation Water Code  
P.O. Box 151  
Toppenish, WA 98948

Jeff Breckel  
Lower Columbia Fish  
Recovery Board  
2127 8th Ave  
Longview, WA 98632

Melodie Tereski  
Lower Columbia Fish  
Recovery Board  
2127 8th Ave  
Longview, WA 98632

Phil Trask  
Lower Columbia Fish  
Recovery Board  
2127 8th Ave  
Longview, WA 98632

Charly Boyd  
Skamania County  
PO Box 790  
Stevenson, WA 98648

Dave McClure  
Klickitat County  
228 W. Main St MS-CH-17  
Goldendale, WA 98620

Cathy Schaeffer  
Walla Walla County  
PO Box 1506  
310 W. Poplar, Suite 001)  
Walla Walla, WA 99362-2865

Robert Buchert  
Palouse Conservation District  
325 NW State Street  
Pullman, WA 99163

David Lundgren  
Lincoln County  
27234 SR 25N  
Davenport, WA 9122

Sarah Walker  
Chelan County Conservation Dist.  
301 Yakima St., Room 307  
Wenatchee, WA 98801

Tim Simpson  
Asotin County  
PO Box 6051  
Clarkston, WA 98403-0605

Jim Milton  
Tri-County Water Resource Agency  
2301 Fruitvale Blvd  
Yakima, WA 98902

Mike Kaputa  
Chelan County  
316 Washington St., Ste 401  
Wenatchee, WA  
98801

Jim DeGraffenreid  
Lincoln County  
27234 SR-25N  
Davenport, WA 99122

Marilynn Lynn  
Foster Creek Conservation District  
PO Box 428  
Waterville, WA 98858-0428

Mike Kaputa  
Chelan County Natural Res. Dept.  
316 Washington St., Ste 401  
Wenatchee, WA 98801

Mary Jo Sanborn  
Chelan County Natural Resources Dept.  
316 Washington Street, Ste 401  
Wenatchee, WA 98801

Peggy Entzel  
Chelan County Conservation District  
301 Yakima St. Room 307  
Wenatchee, WA 98801

Nick Christoph  
Okanogan County  
PO Box 791  
Okanogan, WA 98841

Craig Nelson  
Okanogan Conservation District  
1251 S. 2nd Ave. Room 101  
Okanogan, WA 98840

Rob Lindsay  
Spokane County Public Works  
Utilities Division  
1026 W. Broadway  
Spokane, WA 99260-0430

Walt Edelen  
Spokane County Conservation Dist.  
210 N Havana  
Spokane, WA 99202

Linda Kiefer  
Stevens County  
215 S. Oak St.  
Colville, WA 99114

Joy Osterberg  
Ferry County  
350 East Delaware #5  
Republic, WA 99166

Don Comins  
Pend Oreille Conservation Dist.  
PO Box 280  
Newport, WA 99156

Asotin County Library  
417 Sycamore Street  
Clarkston, WA 99403-2666

Ephrata Community Library  
45 Alder Street NW  
Ephrata, WA 98823-2420

Colville Public Library  
195 South Oak Street  
Colville, WA 99114-2845

Grand Coulee Community Library  
225 Federal  
Grand Coulee, WA 99133-0062

Dayton Memorial Library  
111 South 3rd Street  
Dayton, WA 99328-0074

Moses Lake Community Library  
418 East 5th Avenue  
Moses Lake, WA 98837-1797

Fort Vancouver Regional Library Dist.  
1007 East Mill Plain Blvd  
Vancouver, WA 98663-3504

Okanogan Community Library  
228 Pine  
Okanogan, WA 98840-0489

Kennewick Library  
1600 South Union Street #1699  
Kennewick, WA 99338-2264

Wenatchee Public Library-NCRL  
NCRL Headquarters  
318 Douglas Street  
Wenatchee, WA 98801-2864

Othello Library  
101 East Main Street  
Othello, WA 99344-1039

Richland Public Library  
955 Northgate Drive  
Richland, WA 99352-3539

Odessa Public Library  
21 East 1st  
Odessa, WA 99159-0218

Spokane Public Branch  
906 West Main Avenue  
Spokane, WA 99206-5114

Pasco Library  
1320 West Hopkins Street  
Pasco, WA 99301-5097

Walla Walla Public Library  
238 East Alder Street  
Walla Walla, WA 99362-1943

Bridgeport Community Library  
1206 Columbia Street  
Bridgeport, WA 98813-0220

Yakima Valley Regional Library  
102 North 3rd Street  
Yakima, WA 98901-2759

Coulee City Community Library  
405 West Main Street  
Coulee City, WA 99115-0387

Attn: Roger Sonnichsen  
US Bureau of Reclamation  
P.O. Box 815  
Ephrata, WA 98823

Jake Wollmant  
CBDC  
1054 W. Harder Rd.  
Warden, WA 98857

Clark Kagele  
CBDL  
1491 Kagele Rd. N  
Odessa, WA 99159

Devon Michel  
2235 McManaman Rd.  
Othello, WA 99344

Adam J. Fyall  
7127 West Okanogan Place  
Kennewick, WA 99336

VJ Meadows  
Benton County  
P.O. Box 910  
Prosser, WA 99350

Pete Rogalsky  
City of Richland  
505 Swift Blvd.  
Richland, WA 99352

Peter Beaudry  
City of Kennewick  
P.O. Box 6108  
Kennewick, WA 99336

Victor Johnson  
Kennewick Irrigation District  
1500 S. Clodfelter Rd.  
Kennewick, WA 99336

Nancy Aldrich  
City of Richland  
P.O. Box 190, MS-26  
Richland, WA 99352

Keith Goehner  
400 Douglas Street  
Wenatchee, WA 98801

Deborah Bird  
National Park Service  
Lake Roosevelt National Recreation Area  
1008 Crest Dr.  
Coulee Dam, WA 99116

Gerald W. Kelso, Area Manager  
U.S. Bureau of Reclamation  
Upper Columbia Area Office  
1917 Marsh Rd.  
Yakima, WA 98901

Shannon D. Work, P.C.  
Attorney at Law  
P.O. Box 3409  
Coeur d'Alene, ID 83816

Buell Hawkins, Commissioner  
Commissioner Chambers  
400 Douglas St.  
Wenatchee, WA 98801

Sandy Swope Moody  
WA Natural Heritage Program  
Department of Natural Resources  
P.O. Box 47014  
Olympia, WA 98504

Brett VandenHeuvel  
Law Office of Brett VandenHeuvel  
620 SW Main, Ste. 615  
Portland, OR 97205

Brent Foster  
Columbia Riverkeeper  
724 Oak Street  
Hood River, OR 97301

Brian Walker  
The Lands Council  
c 423 W. First Ave, Ste. 240  
Spokane, WA 99201

John Osborn, MD  
Upper Columbia River Group  
Box 413  
Spokane, WA 99210

Harold Shepherd  
Center for Water Advocacy  
P.O. Box 583  
Clifton, CO 81520

Llewellyn Matthews  
NW Pulp & Paper Association  
1300 114<sup>th</sup> Ave. SE, Ste. 200  
Bellevue, WA 98004

Peter Fraley  
Ogden Murphy Wallace PLLC  
1 Fifth Street, Suite 200  
P.O. box 1606  
Wenatchee, WA 98807

Paul Stoker  
890 South Lucy Rd.  
Othello, WA 99344

Pat Hamod  
Ferry Conservation District  
P.O. Box 1045  
Republic, WA 99166

Andrew Dunau  
2206 South Sherman St.  
Spokane, WA 99203

Tri-Cities Herald, Andrew Sicocchi  
P.O. Box 2608  
Pasco, WA 99302

Mark Peterson  
Peterson Law Office  
103 Palouse St, Ste. 5  
Wenatchee, WA 98801

Dennis Bly  
Lincoln County Commissioner  
P.O. Box 28  
Davenport, WA 99122

Yakima Basin Storage Alliance  
P.O. Box 30  
Prosser, WA 99350

Stuart Crane  
Yakima Nation Water Program  
503 South Elm St.  
Toppenish, WA 98948

Merle Gibbens  
Grand Coulee Project  
Hydroelectric Authority  
P.O. Box 219  
Ephrata, WA 98823

Sally Sovee  
Bureau of Land Management  
915 Walla Walla Ave.  
Wenatchee, WA 98801

David Taylor, Taylor Angus Ranch  
1661 Beane Rd.  
Moxee, WA 98936

Bob Heinith  
Columbia River Inter-Tribal  
Fish Commission  
729 NE Oregon St, Ste. 200  
Portland, OR 97232

Harold Heacock  
Tri-Cities Development Council  
901 North Colorado  
Kennewick, WA 99336

**NOTICE OF AVAILABILITY**

Karst Riggers  
Asotin County  
P.O. Box 610  
Asotin WA 99402

Benton Clean Air Authority  
114 Columbia Point Dr Ste C  
Richland WA 99352

Terry Marden  
Benton County  
P.O. Box 910  
Prosser WA 99350

Bob Koeing  
Cascade Bassmasters  
20033 Birch Way  
Lynnwood WA 98063

Audie Palmantier  
Chelan Bass Club  
P.O. Box 212  
Chelan WA 98816

Monte Brachmann  
City of Camas  
P.O. Box 1055  
Camas WA 98607

Glenn Scholten  
City of Cheney  
112 Anderson Rd  
Cheney WA 99004

Connie Krueger  
City of College Place  
310 West Poplar #001  
Walla Walla WA 99362

Jim Sewell  
City of Grandview  
207 West 2nd St  
Grandview WA 98930

Kent Anderson  
City of Kelso  
105 Allen St  
Kelso WA 98626

Robert Millspaw  
City of Longview  
P.O. Box 128  
Longview WA 98632

Mark Workman  
City of Pullman  
P.O. Box 249  
Pullman WA 99163

Dan Frazier  
City of Quincy  
P.O. Box 338  
Quincy WA 98848

John Granholm  
City of Stevenson  
P.O. Box 371  
Stevenson WA 98648

Mark Kunkler  
City of Sunnyside  
818 East Edison Ave  
Sunnyside WA 98944

Chad Eiken  
City of Vancouver  
P.O. Box 1995  
Vancouver WA 98668

William Cook  
City of Yakima  
129 North 2nd St  
Yakima WA 98901

Travis Goddard  
Clark County  
P.O. Box 9810  
Vancouver WA 98668

Columbia Basin Fish & Wildlife  
851 Sw 6th Ave Ste 260  
Portland OR 97204

Verla & Charles Row  
Columbia Basin Walleye Club  
1811 S 17th St  
Union Gap WA 98903

Cowlitz County  
207 Fourth Ave N  
Kelso WA 98626

Dept of Community Development  
P.O. Box 48300  
Olympia WA 98504

Ducks Unlimited Inc  
One Waterfowl Way  
Memphis TN 38120

Allen Fiksdal  
Energy Facility Site Eval. Council  
P.O. Box 43172  
Olympia WA 98504

Grand Coulee Dam Area,  
Chamber of Commerce  
P.O. Box 760  
Grand Coulee WA 99133

Merle Gibbons  
Grand Coulee Power Hydro Authority  
P.O. Box 219  
Ephrata WA 98823

Grant County Edc  
6594 Patton Blvd Ne  
Moses Lake WA 98837

Jerry Janke  
Grant County Noxious Weed Control  
P.O. Box 1115  
Ephrata WA 98823

Grant County Public Works Department  
124 Enterprise St Se  
Ephrata WA 98823

Grant County Tourism Commission  
P.O. Box 37  
Ephrata WA 98823

Yvonne and Gary Eyer  
10411 East 24<sup>th</sup> Ave.  
Spokane Valley, WA 99206

Jackie Keele  
601 South Pioneer Way  
Suite F, PMB 108  
Moses Lake, WA 98837

Ken Hilton  
9652 Superior Ct. NE  
Moses Lake, WA 98837

Lloyd Henry  
833 Aladdin Rd.  
Colville, WA 99114

Pearl Fletcher  
P.O. Box 9  
Royal City, WA 99357

Larry A. Stewart  
16243 Rd. E SW  
Royal City, WA 99357

Shelly Short  
555 South Main St., Ste. A  
Colville, WA 99114

Anita and Larry Sather  
P.O. Box 128  
Royal City, WA 99357

William L. Pelham  
3565 Lower Crab Creek Rd.  
Royal City, WA 99357

Jayn Courchais  
East 17201 Cataldo  
Spokane Valley, WA 99016

Caroline Mathews  
9035 Lower Crab Creek Rd. W  
Royal City, WA 99357

Jack Myriel  
1751 Rd. E NE  
Moses Lake, WA 98837

M.L. Gerdy  
7227 Lower Crab Creek Rd. W  
Royal City, WA 99357

Don and Shannon Stewart  
15908 Rd. E SW  
Royal City, WA 99357

Shirley Stewart  
5248 Rd. 16-4 SW  
Royal City, WA 99357

Dewey Lester  
4528 SE 13<sup>th</sup>  
Othello, WA 99344

Paula Forester  
17669 Rd. 9 SW  
Royal City, WA 99357

Kathleen Bergen  
9428 Goodrich Rd. SE  
Moses Lake, WA 98837

Joan Prchal  
10022 Rd. R. SW  
Royal City, WA 99357

Ronald Hull  
2145 Basin St. SW, Suite C  
Ephrata, WA 98823

Norma J. Booker  
P.O. Box 116  
Royal City, WA 99357

Bob and Terese Schrom  
7240 Rd. 17 SW  
Royal City, WA 99357

Kurt Hughes  
612 ½ W. McGraw St.  
Seattle, WA 98119

Tanna Thornton  
17203 E. Cataldo Ave.  
Greenacres, WA 99016

Jim Irish  
1653 E. Heritage Loop  
LaCenter, WA 98629

Jerry Thornton  
2240 E. 30<sup>th</sup>  
Kennewick, WA 99337

Douglas Dick  
917 Adams Ave.  
Toppenish, WA 98948

Agnes Ketchen  
P.O. Box 157  
Toppenish, WA 98948

Robert F. Smith  
618 W. Lake Samish Dr.  
Bellingham, WA 98229

Mike Smith  
713 S. Yolo St.  
Kennewick, WA 99336

Steve Hailey  
691 Hailey Rd.  
Mesa, WA 99343

William E. Farris  
2533 Harris Ave.  
Richland, WA 99354

Larry Hullet  
6311 Morrison St.  
West Richland, WA 99353

Erin Fuhrer  
Benton Conservation District  
415 Wine Country Rd.  
Prosser, WA 99350

Mario Martinez  
P.O. Box 872  
Mabton, WA 98935

Nancy Kenmotsu  
101 N. 48<sup>th</sup> Ave. 613  
Yakima, WA 98908

Ray Lam  
31831 W. Hwy 12  
Walla Walla, WA 99363

Becky and Dave Bechtold  
7623 W. River Blvd.  
Pasco, WA 99301

Bruce Beauchene  
98705 E. Clover Rd.  
Kennewick, WA 99336

Terry Tolan  
1020 W. Center Pkwy, Ste F  
Kennewick, WA 99336

Chuck Garner  
8606 Bell St.  
Pasco, WA 99301

Dan McDonald  
MWH Americas  
2353 130<sup>th</sup> Ave. NE  
Bellevue, WA 98004

Tim Richman  
City of Kennewick  
P.O. Box 6100  
Kennewick, WA 99336

Kevin Lindsey  
Groundwater Solutions  
1020 W. Center Pkwy, Suite F  
Kennewick, WA 99336

Kevin Scribner  
500 Tamsick Way  
Walla Walla, WA 99362

Stan Schweissing  
3631 W. Klamath Ave.  
Kennewick, WA 99336

L. McCracken  
231 Cowell Dr.  
Prescott, WA 99348

Susan Evans  
1101 Appleland Dr.  
Wenatchee, WA 98801

Steve Kolk  
301 Yakima, Rm. 311  
Wenatchee, WA 98801

Larry M. Cordes  
104 E. 9<sup>th</sup> St.  
Wenatchee, WA 98801

Steve Jenkins  
P.O. Box 640  
Bridgeport, WA 98813

C. and N. Fliegel  
7 Columbia View Dr.  
Quincy, WA 98848

Stuart Crank  
503 South Elm St.  
Toppenish, WA 98948

Jessica Shaw  
P.O. Box 519  
Wenatchee, WA 98807

Steve Nelson  
1211 N. Lake Stickory Dr.  
Lynnwood, WA 98087

Kris Kauffman  
12228 Nyanza Rd. SW  
Lakewood, WA 98499

Dennis Dorrategue  
2353 130<sup>th</sup> Ave. NE  
Bellevue, WA 98005

Carol VanArnam  
129 S. Emerson  
Wenatchee, WA 98801

Jon Soest  
18150 River Rd.  
Leavenworth, WA 98826

Chuck Jones  
530 Valley Mall Pkwy, Ste. 4  
East Wenatchee, WA 98802

Kristi Scherger  
Walla Walla County Watershed Planning  
Department  
310 W. Poplar, Ste. 201  
Walla Walla, WA 99362

Stephen R. Oliver  
Bonneville Power Administration – PG/5  
P.O. Box 3621  
Portland, OR 97208

Randy Asplund  
300 Simon St. #6  
East Wenatchee, WA 98802

Laura Ackerman and Larry Hampson  
3118 S. Windsor Rd.  
Spokane, WA 99224

Wesley L. McCart, President  
Stevens County Farm Bureau  
4979 Lyons Hill Rd.  
Springdale, WA 99173

Dan Curry  
Department of Public Works  
City of Wenatchee  
P.O. Box 388  
Wenatchee, WA 98807

Peter S. Burgoon, PhD, PE  
103 Palouse St, Ste. 2  
Wenatchee, WA 98801

Barney Bowdish  
31350 Aspen Lane  
Davenport, WA 99122

Lois J. Aldrich  
33917 Hawk Creek Ranch Rd. N  
Davenport, WA 99122

Paul Marker  
711-14<sup>th</sup> NE  
East Wenatchee, WA 98802

Julie Dalsaso  
P.O. Box 5053  
Coeur d'Alene, ID 83814

Wanda Daehlin  
1608 S. Ash St.  
Spokane, WA 99203

Jena Gilman  
1480 SW 10<sup>th</sup> St.  
North Bend, WA 98045

Frans Eykel  
199 Ostervold Rd.  
Cathlamet, WA 98612

Jason Duba  
Faith and Environment Network  
2612 W. Gardner  
Spokane, WA 99201

Jacqui Halvorson  
3417 S. Division  
Spokane, WA 99203

Suzi Hokonsoon  
1315 W. Woodside  
Spokane, WA 99208

James Hollingsworth  
2508 S. Adams Rd.  
Veradale, WA 99037

Mary Jokela  
35417 N. Dalton Rd.  
Deer Park, WA 99006

Beatrice Lackaff  
2018 W. Bridge Ave.  
Spokane, WA 99201

James C. Langford  
1338 Sacramento  
Richland, WA 99354

Harvey Morrison  
3805 S. Lamonte  
Spokane, WA 99203

W. Thomas Soeldner  
801 W. Riverside Ave, Ste. 220  
Spokane, WA 99201

Jan Treecraft  
1203 W. 16<sup>th</sup> Ave.  
Spokane, WA 99203

Lynn Fackenthall Wells  
5924 Homestead Way  
Nine Mile Falls, WA 99026

Helen Whitney Virgin, PhD  
32583 Whitney Rd. E  
Davenport, WA 99122

Cathy Verret  
2450 Potter St.  
Eugene, OR 97405

Eldon Roush  
2213 Hwy 25 North  
Evans, WA 99216

Barbara Winkle  
3231 W. Boone Ave. #911  
Spokane, WA 99201

Larry Vinsonhaler  
2567 Lynx Way  
Boise, ID 83705

Bob Hall  
P.O. Box 1262  
Yakima, WA 98907

Katie Lafree, Sr. Admin Assistant  
City of Bellevue-Utilities Dept  
450 110 Ave. NE  
Bellevue, WA 98004

Larry Mattson  
2810 Shelton Ave.  
Yakima, WA 98902

Patricia Smith  
1029 SW Cherry Park Rd.  
Troutdale, OR 97060

Rebecca Penn  
626 32<sup>nd</sup> Ave.  
Seattle, WA 98112

Steven Hughes  
URS Corp  
1501 4<sup>th</sup> Ave, Ste. 1400  
Seattle, WA 98101

Glen Klock  
Wenatchee Resources Analysis Inc.  
2113 Sunrise Circle  
Wenatchee, WA 98801

Graeme Aggett  
Riverside Technology Inc.  
2290 East Prospect  
Fort Collins, CO 80525

Ryan Sudbury  
Nez Perce Tribe  
P.O. Box 305  
Lapwai, ID 83843

Alex Zimmerman  
3400 SE Columbia Way #43  
Vancouver, WA 98661

Tam Seasholtz  
P.O. Box 2465  
Portland, OR 97208

Lawrence Hullet  
Student - Columbia Basin College  
6311 Morrison Street  
West Richland, WA 99353