WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Final Environmental Impact Statement for Watershed Planning under Chapter 90.82 RCW

July 18, 2003
Shorelands and Environmental Assistance Program
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August 18, 2003

RE: Final Environmental Impact Statement for Watershed Planning

Dear Interested Parties:

I am pleased to present this final environmental impact statement addressing the development and implementation of watershed plans under the Watershed Planning Act, Chapter 90.82 RCW. The 2001 Washington State Legislature, directed the Department of Ecology (Ecology) to develop a State Environmental Policy Act (SEPA) "template," to streamline environmental review associated with local approval of watershed plans. Based on input from lead agencies for various watershed planning units around the state, it was concluded that the most appropriate form for the template, would be a statewide environmental impact statement that could be adopted in whole or in part by SEPA lead agencies as part of local watershed plan approval processes.

This final environmental impact statement describes the watershed planning process set forth in the Watershed Planning Act, as well as procedures for rule making that may be undertaken by state agencies to support implementation of watershed plans. It describes the existing framework of federal, state, and local laws, regulations, and programs that affect, or are related to management of watersheds. In addition, it evaluates the impacts of, and identifies mitigation measures for, various types or classes of recommended actions that may be included in watershed plans. These generic recommendations were developed based on input from lead agencies for watershed plans and Ecology watershed leads working with planning units. Generic recommended actions are presented and evaluated for each of the four components of watershed planning including water quantity, instream flow, water quality, and habitat. A "no action" alternative for each of the four components is also analyzed. A draft environmental impact statement was prepared and distributed on March 28, 2003 for a 45 day comment period. The document includes comments received by Ecology regarding the draft, as well as Ecology's responses to the comments.

We believe this final environmental impact statement will assist decision makers to identify the key environmental issues, and options associated with actions related to development and implementation of watershed plans.

Sincerely,

Gordon White
Program Manager

Gordon White

Shorelands and Environmental Assistance Program

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR WATERSHED PLANNING UNDER CHAPTER 90.82 RCW

FACT SHEET

Brief Description of Proposal:

The proposal consists of local development and approval of watershed plans under provisions of the Watershed Planning Act (Chapter 90.82 RCW) and rule making undertaken by state agencies to support implementation of such watershed plans. All watershed plans prepared under Chapter 90.82 RCW must contain a water quantity component and may, at the discretion of the initiating governments for a Water Resources Inventory Area (WRIA) or multi-WRIA planning area, contain instream flow, water quality, and habitat components. The planning process defined in Chapter 90.82 RCW involves three initial phases: 1) organization, during which the planning unit is formed and the scope of watershed planning is developed; 2) technical assessment; 3) plan development as well as approval of the plan by the jurisdictional county legislative authority or authorities. The first three phases of watershed planning are followed by a fourth phase, watershed plan implementation.

Proposed or Tentative Date for Implementation:

At date of publication, watershed planning under Chapter 90.82 RCW is occurring in 42 of the state's 62 Water Resources Inventory Areas (WRIAs). The 42 WRIAs are represented by 33 planning units engaged in watershed planning including eight multi-WRIA planning efforts. In accordance with provisions of Chapter 90.82 RCW, watershed plans associated with these planning efforts are scheduled to be approved by jurisdictional county legislative authorities between 2003 and 2006. It is anticipated that watershed plan implementation activities will be ongoing thereafter.

Proponent:

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Permits, Licenses, and Approvals Required for Proposal:

Watershed plans prepared in accordance with provisions of Chapter 90.82 RCW may include a broad range of recommended actions to address issues and problems associated with water quantity, instream flow, water quality, and habitat. In consideration of the potential variability in content of individual watershed plans, it is not possible to present an exhaustive list of permits, licenses, and approvals that may be required for each plan that will be developed throughout the state. It is possible, however, to identify a number of the most common types of permits, licenses, and approvals associated with water resources and habitat. These permits, licenses, and approvals are listed below by the jurisdictional agency:

Federal Permits, Licenses, and Approvals

Section 404 permit – U.S. Army Corp of Engineers
Section 10 permit – U.S. Army Corp of Engineers
Endangered Species Act consultation – NOAA Fisheries
Endangered Species Act consultation – U.S. Fish and Wildlife Service
Federal Energy Regulatory Commission (FERC) License – FERC

State Permits, Licenses, and Approvals

Water use permit/certificate of water right – Department of Ecology
Reservoir permit/aquifer storage and recovery – Department of Ecology
Dam safety permit – Department of Ecology
National Pollutant Discharge Elimination System permit – Department of Ecology
State waste discharge permit – Department of Ecology
Section 401 water quality certification – Department of Ecology
Shoreline conditional use permit, or variance – Department of Ecology
Reclaimed water use permit – Department of Health and Department of Ecology
Group A drinking water operating permit – Department of Health
Water system plan approval – Department of Health
Hydraulic project approval – Department of Fish and Wildlife
Coastal zone management consistency determination – Department of Ecology
Forest practices approval – Department of Natural Resources

Local Permits, Licenses, and Approvals
Critical areas permit or approval – Appropriate local jurisdictional agency
Floodplain development permit – Appropriate local jurisdictional agency
Shoreline substantial development permit, conditional use permit, or variance – Appropriate local jurisdictional agency
Building permit – Appropriate local jurisdictional agency
Grading permit – Appropriate local jurisdictional agency

In addition, implementation of some aspects of watershed plans developed under Chapter 90.82 RCW may require rule making by state agencies to implement state agency obligations.

Authors and Contributors to the Environmental Impact Statement:

Principal Author**:** Derek Sandison, Department of Ecology, Shorelands and Environmental Assistance (SEA) Program

The following **agency** individuals were contributors to the preparation of the draft and final environmental impact statement:

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Alice Schisel – Section 3.5.5 (Laws, Regulations, and Programs Related to Watershed Planning – Portion relating to shoreline management)
Lynne Geller – Sections 6.26 and 6.27 (Impacts and Mitigation Measures – Instream flow alternatives)
John Monahan – Section 4.6 (Affected Environment - Wildlife); Sections 6.26 and 6.27 (Impacts and Mitigation Measures – Instream flow alternatives)
Catherine Reed – Section 4.5 (Affected Environment – Plants)

The following **agency** individuals were reviewers or editors of the environmental impact statement:

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John Monahan – All chapters
Derek Sandison – All chapters
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Barbara Ritchie – Chapter 2.0 (State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) Compliance for Watershed Plans)
Dan Haller – Section 3.1 (Laws, Regulations, and Programs Related to Watershed Planning – Water Quantity Section)
Richard Frye – Section 3.2 (Laws, Regulations, and Programs Related to Watershed Planning – Water Quality Section)
Mark Schuppe – Section 3.4.9 (Laws, Regulations, and Programs Related to Watershed Planning – Portion of Habitat Section regarding federal and state regulatory programs)

Bob Barwin – Portions of Chapters 3.0, 4.0, and 6.0 related to comments received on the draft document

Doug Rushton – Sections 6.1 through 6.25 (Impacts and Mitigation Measures – all water quantity alternatives)

Governor's Salmon Recovery Office

Bob Bugert – Sections 3.4.1 through 3.4.4 (Laws, Regulations, and Programs Related to Watershed Planning – Portions of Habitat Section regarding Endangered Species Act and Salmon Recovery)

The following **contract** individuals were contributors to the preparation of the draft and final environmental impact statement:

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Mary McCrea – Section 3.1.6 (Laws, Regulations, and Programs Related to Watershed Planning – Portion of Water Quantity Section regarding system for water right permitting and relinquishment) and Sections 5.2.1, 5.2.2, and 5.2.3 (Water Quantity alternatives)

Science Applications International Corporation (SAIC)

Ted Turk – Section 2.3 (State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) Compliance for Watershed Plans – Portion regarding NEPA compliance)

Mark Dagel – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Earth and Ground Water)

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Jim Eldridge – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Plants and Wildlife)

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Mark Yinger – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Surface Water and Ground Water)

Karen F. Welch – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Surface Water

Watershed Professionals Network

Joanne (Joanie) Greenberg – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Surface Water)

Domoni Glass – Chapter 6.0 (Impacts and Mitigation Measures – Discussions regarding Surface Water (quality), Ground Water (quality), and Wildlife (fish))

Date of Issue of Final Environmental Impact Statement: August 18, 2003

Date Final Action Is Planned or Scheduled:

In accordance with provisions of Chapter 90.82 RCW, the local watershed plans currently in preparation are scheduled to be approved by jurisdictional county legislative authorities between 2003 and 2006. It is anticipated that watershed plan implementation activities will be ongoing thereafter. State rule making in support watershed plan implementation could occur at any time after a plan has been adopted.

Timing of Additional Environmental Review:

This statewide nonproject environmental impact statement has been prepared to generally address probable significant adverse environmental impacts associated with watershed planning conducted under provisions of Chapter 90.82 RCW. Individual watershed plans will require additional environmental review at the local level, which could potentially involve preparation of an addendum to the statewide nonproject environmental impact statement or preparation of a supplemental environmental impact statement.

Many of the recommended actions of individual watershed plans may require project level or nonproject level SEPA review at time of implementation.

Availability of Final Environmental Impact Statement: August 18, 03

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TABLE OF CONTENTS

FIGURES

TABLES

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CHAPTER 1.0
DESCRIPTION OF PROPOSAL AND BACKGROUND

1.1 DESCRIPTION OF PROPOSAL

The proposal consists of development and approval of watershed plans under provisions of the Watershed Planning Act, Chapter 90.82 RCW, and state agency rule making that may be undertaken to support implementation of such watershed plans. The Watershed Planning Act establishes a comprehensive and cooperative method for assessment of the current status of water resources within the state's watersheds, and for local development of watershed plans for management of such resources. The act creates a framework for addressing the state's water resource and water quality issues, establishing instream flows, and addressing salmon habitat needs.

All watershed plans prepared under Chapter 90.82 RCW must contain a water quantity component and may, at the discretion of the initiating governments for a Water Resources Inventory Area (WRIA) or multi-WRIA planning area, contain instream flow, water quality, and habitat components. The planning process defined in Chapter 90.82 RCW involves three initial phases: 1) organization, during which the planning unit is formed and the scope of watershed planning is developed; 2) technical assessment; and 3) plan development as well as approval of the plan by the jurisdictional county legislative authority or authorities.

The three initial phases of watershed planning are followed by a fourth phase, watershed plan implementation. After approval of a plan by the jurisdictional county legislative authority or authorities, state and local entities that were party to the plan and its recommended actions become obligated to implement the recommended actions.

1.2 PURPOSE AND NEED FOR PROPOSAL

Within many of the state's watersheds, significant water resource issues have arisen concerning diminishing water availability, declining water quality, and loss of critical habitat for fish and wildlife. Past efforts to manage water resources through statewide planning as well as statewide policy and regulatory development and implementation have generally been unsuccessful in addressing the aforementioned issues because such efforts failed to account for local variability in socioeconomic, political, and natural resource conditions.

In passage of Chapter 90.82 RCW, the legislature determined that local development of watershed plans for managing water resources and for protecting existing water rights is vital to both state and local interests. Local development of such plans serves vital local interests by placing it in the hands of people who have:

- The greatest knowledge of both the resources and the aspirations of those who live and work in watersheds; and

- The greatest stake in the proper, long-term management of the resources.

The legislature also found that the development of watershed plans serves the state's vital interests by ensuring that the state's water resources are used wisely, by protecting existing water rights, by protecting instream flows for fish, and by providing for the economic well-being of the state's citizenry and communities.

1.3 LEGISLATIVE AUTHORITY OR LEGAL MANDATE FOR PROPOSAL

Chapter 90.82 RCW establishes a framework for watershed planning to address the state's water resource and water quality issues, as well as to establish instream flows and address salmon habitat needs. While local governments are not required to perform watershed planning under Chapter 90.82 RCW, those that accept funding from the Department of Ecology (hereafter referred to as Ecology) for that purpose must conduct planning in accordance with the provisions of that RCW.

1.4 OBJECTIVES OF PROPOSAL

The objectives of watershed plans developed under Chapter 90.82 RCW are to:

- Supply water in sufficient quantities to satisfy the minimum instream flows for fish and to provide water for future out-of-stream uses for water; and

- Ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth consistent with of the state's Growth Management Act (Chapter 36.70A RCW).

In addition, watershed plans may incorporate plan components that are intended to:

- Provide recommendations for modifications to instream flows already adopted by rule, or to set, in a collaborative process between Ecology and individual planning units as described in RCW 90.82.080 (1) (a) (ii), instream flows for streams for which instream flows have not previously been adopted;

- Provide a recommended approach for implementing total maximum daily loads established by the department for achieving compliance with water quality standards in nonmarine waters within a WRIA or multi-WRIA planning area; and

- Protect or enhance fish habitat in a WRIA or multi-WRIA planning area.

In addition, most planning units have or will develop objectives specific to their WRIA or multi-WRIA planning area as part of watershed plan development.

1.5 DESCRIPTION OF WATERSHED PLANNING PROCESS

Watershed planning conducted under Chapter 90.82 RCW may be initiated for a Water Resources Inventory Area (WRIA) only with the unanimous consent of the initiating governments within the WRIA. The initiating governments include:

- All counties within the WRIA;
- The largest city or town within the WRIA (unless the WRIA does not contain a city or a town); and
- The water supply utility obtaining the largest quantity of water from the WRIA, or, in the case of WRIA's with lands within the federal Columbia Basin Project, the water supply utility obtaining the largest quantity of water <u>for</u> the WRIA (RCW 90.82.060).

The aforementioned entities must invite all tribes with reservation lands within the WRIA to participate as initiating governments.

In cases where a watershed planning area consists of multiple WRIAs, the initiating governments include: all counties within the multi-WRIA planning area, the largest city or town within each WRIA, and the water supply utility obtaining the largest quantity of water in each WRIA. As with single WRIA planning efforts, the aforementioned entities must invite all tribes with reservation lands within the multi-WRIA area to participate as initiating governments.

The initiating governments for each WRIA or multi-WRIA planning area are responsible for selecting a lead agency for watershed planning. The lead agency coordinates staff support and receives grants from the Ecology to fund the watershed planning process. Once the initiating governments for a WRIA or multi-WRIA planning area have designated their lead agency, they must provide notification to Ecology of their intent to proceed with watershed planning under Chapter 90.82 RCW and may apply for funding assistance to support planning activities.

Under Chapter 90.82 RCW, funding assistance for watershed planning activities is available for three distinct phases: 1) organization, 2) technical assessment, and 3) plan development and approval. These phases are discussed in more detail below followed by a discussion of plan implementation.

1.5.1 Phase One – Organization

During Phase One of watershed planning, the initiating governments for each WRIA or multi-WRIA planning area are required to organize a planning unit responsible for development of the watershed plan. Initiating governments can apply for grants of up to $50,000 for a single WRIA or up to $75,000 for a multi-WRIA planning area to support initial organization.

Although Chapter 90.82 RCW does not contain specific requirements for composition of a planning unit, it does stipulate that in selecting members for a planning unit, initiating governments must "provide for representation of a wide range of water resource interests" (RCW 90.82.060). Composition of the planning unit may vary considerably from WRIA to WRIA because of differences in the nature and extent of specific beneficial uses of water, or the level of stakeholder interest in water resource related issues, or both. Examples of planning members could include, but are not limited to, representatives of:

- Cities, public water supply utilities or districts, or irrigation districts in addition to those designated as initiating governments;

- Federal agencies such as the Bureau of Reclamation, U.S. Army Corps of Engineers; and U.S. Forest Service;

- State agencies such as Ecology, Department of Fish and Wildlife, Department of Health, Department of Natural Resources, Department of Transportation, Office of Community Development, Conservation Commission, and Parks and Recreation Commission;

- Local agencies such as county or city planning departments, public works departments, and local health jurisdictions;

- Sewer districts, conservation districts, flood control districts, and other local governmental or quasi-governmental organizations;

- Tribes with reservation lands within a WRIA engaged in watershed planning;

- Tribes with treaty fishing rights within a WRIA undergoing watershed planning under Chapter 90.82 RCW;

- The public at large;

- Business interests such as developers, builders, timber and forest products industries, shellfish industry, commercial fishing industry, chambers of commerce, and other industrial organizations and associations;

- Agricultural interests including farmers and ranchers;

- Recreational interests including sport fishing groups and organizations, whitewater rafting groups, and kayaking groups;

- Environmental organizations; and

- Watershed councils, Salmon Recovery Lead Entities, or similar watershed related organizations.

Although not required under Chapter 90.82 RCW, some planning units have designated agencies, tribes, or organizations that are not primary stakeholders in the watershed planning process, but nonetheless wish to be or should be kept apprised of that process, as "ex-officio" or non-voting members or granted them "interested party status." In this manner, the non-voting member or interested party has ongoing opportunities to provide input to the planning process.

It should be noted that 12 state agencies entered into a memorandum of understanding (MOU) regarding their roles and responsibilities in supporting watershed planning and salmon recovery efforts at the local level (Department of Agriculture et al, 1998). Under the MOU, Ecology coordinates the participation of the 12 departments and agencies in local watershed planning efforts, including providing information and technical assistance to planning units.

Additionally, the initiating government must establish the initial scope of watershed planning during Phase One; although, the scope may be modified during subsequent phases. The scope of planning must include a water quantity component and may, at the discretion of the initiating governments, also include instream flow, water quality, and habitat components. By December 1, 2001, or within one year of initiating Phase One of watershed planning, whichever occurs later, the initiating governments for each WRIA or multi-WRIA planning area in which watershed planning has commenced must decide, by majority vote, whether to include an instream flow component in its watershed plan.

The initiating governments, in consultation with state government, other local governments, and affected tribal governments, establish the watershed planning process and protocols during Phase One. Phase One may also involve determination of goals and objectives for the watershed plan; development of a work plan, budget, and schedule for subsequent phases; prioritization of issues; formation of special committees; development of a public involvement process; and establishment of a data management program.

1.5.2 Phase Two – Technical Assessment

The technical assessment consists of an evaluation of the status of water resources within each WRIA or multi-WRIA planning area, and provides information necessary to support plan development. Generally, planning units take a tiered approach to conducting their technical assessments. Initial assessment activities, referred to as a level 1 assessment, consist of compilation and review of existing data. A level 2 assessment involves collection of new data to fill data gaps identified in the level 1 assessment and to support well-defined decision making needs within the time frame of the watershed planning process. A level 3 assessment involves long-term monitoring initiated after adoption of a watershed management plan to support adaptive management of the watershed.

In accordance with RCW 90.82.070, at a minimum, a technical assessment must include:

- An estimate of the surface and ground water present in the watershed planning area;
- An estimate of the surface and ground water available for beneficial uses within the watershed planning area, taking into consideration seasonal and other variations;
- An estimate of the water in the watershed planning area represented by claims in the water rights claims registry, water use permits, certificated rights, existing minimum instream flow rules, federally reserved rights, and other rights to water;
- An estimate of the surface and ground water actually being used in the watershed planning area;
- An estimate of the water needed in the future for use in the watershed planning area;

- An identification of the location of areas where aquifers are known to recharge surface water bodies and areas known to provide recharge of aquifers from the surface; and

- An estimate of the surface and ground water available for further appropriation, taking into account the minimum instream flows adopted by rule or to be adopted by rule for streams in the watershed planning area including the data needed to evaluate necessary flows for fish.

If a watershed plan includes a water quality component, RCW 90.82.090 requires that the technical assessment include the following:

- An examination, based on existing studies conducted by federal, state, and local agencies, of the extent to which legally established water quality standards are being met within the watershed planning area;

- An evaluation, based on existing studies conducted by federal, state, and local agencies, of the causes of water quality violations in the watershed planning area, including an assessment of information regarding pollutants, point and nonpoint sources of pollution, and pollution carrying capacity of water bodies in the planning area, taking into consideration seasonal stream flow and level variations, natural events, and pollution from natural sources that occurs independent of human activities;

- An assessment of the legally established characteristic uses of each of the nonmarine water bodies in the watershed planning area;

- An examination of any total maximum daily load established for nonmarine water bodies in the watershed planning area, unless a total maximum daily load process has commenced in the planning area as of the date the watershed planning process is initiated under RCW 90.82.060; and

- An evaluation of existing data related to the impact of fresh water on marine water quality, where applicable.

To support the development of technical assessments, a planning unit can apply for up to $200,000 grant funding for each WRIA in its planning area. Chapter 90.82.040 allows for supplemental funding to be provided for the following elements: 1) developing instream flow recommendations; 2), conducting detailed assessments of multipurpose storage opportunities; and 3) conducting water quality assessments. For each of these elements, a planning unit can apply for an additional $100,000 in supplemental funding for each WRIA in its planning area.

1.5.3 Phase Three – Plan Development and Approval

In Phase Three, the watershed plan development and approval phase, the planning unit determines how best to manage the water resources of the WRIA or multi-WRIA planning area. Under 90.82 RCW, planning units are allowed four years from the time that they first draw upon grant funds for Phase Two to submit a proposed watershed plan to the jurisdictional county legislative authority or authorities for approval. Under RCW 90.82.040, a planning unit can apply for grants of up to $250,000 for each WRIA in its planning area for purposes of supporting formulation of recommended actions and development of a watershed plan.

A watershed plan includes recommendations for actions to be taken by local, state, and federal agencies; tribes; private property owners; private organizations; and individual citizens in support of effective watershed management. Chapter 90.82 RCW establishes specific parameters or limitations concerning the content of watershed plans. According to RCW 90.82.120, watershed plans developed and approved under the Watershed Planning Act must not contain provisions that:

> . . . (a) Are in conflict with existing state statutes, federal laws, or tribal treaty rights;
>
> (b) Impair or diminish in any manner an existing water right evidenced by a claim filed in the water rights claims registry established under chapter 90.14 RCW or a water right certificate or permit;
>
> (c) Require a modification in basic operation of a federal reclamation project with a water right the priority date of which is before June 11, 1998, or alter in any manner whatsoever the quantity of water available under the water right for the reclamation project, whether the project has or has not been completed before June 11, 1998;
>
> (d) Affect or interfere with an ongoing general adjudication of water rights;
>
> (e) Modify or require the modification of any waste discharge permit issued under Chapter 90.48 RCW;
>
> (f) Modify or require the modification of activities or actions taken or intended to be taken under a habitat restoration work schedule developed under Chapter 246, Law of 1998 [Salmon Recovery Act, Chapter 77.85 RCW]; or
>
> (g) Modify or require the modification of activities or actions taken to protect or enhance fish habitat if the activities or actions are:
>
> > (i) Part of an approved habitat conservation plan and an incidental take permit, an incidental take statement, a management or recovery plan, or other cooperative or conservation agreement entered into with a federal or state fish and wildlife protection agency under its statutory authority for fish and wildlife protection that addresses the affected habitat; or
> >
> > (ii) Part of a water quality program adopted by an irrigation district under Chapter 87.03 RCW.

Plans may contain recommendations for modifications to local ordinances as well as state rules and permits, but cannot directly bring about such modifications. In addition, watershed plans can not create obligations or restrictions on forest practices that are in addition to or inconsistent with provisions of the Forest Practices Act (Chapter 76.09 RCW) or rules adopted to implement the act. Limitations placed by Chapter 90.82 RCW on the recommended actions of a watershed plan specific to each of the four components of watershed planning (water quantity, instream flow, water quality, and habitat) are discussed in Chapter 5, Alternatives.

Approval of a watershed plan, as stipulated in RCW 90.82.130, involves two-steps: approval of the planning unit followed by approval of the jurisdictional county legislative authority or authorities. Upon completing a watershed plan, the planning unit may approve the plan by consensus of all members of the planning unit, or by consensus among the planning unit members that represent units of government and a majority vote of the nongovernmental members. The watershed plan is then submitted to the county legislative authority or authorities with jurisdiction over lands within the WRIA or multi-WRIA planning area. If a watershed plan is not approved by the planning unit, the planning unit may submit components of the plan for which consensus has been achieved to the county legislative authority or authorities.

Once in receipt of the planning unit approved watershed plan, the jurisdictional county legislative authority or authorities must provide public notice of and conduct a public hearing on the proposed watershed plan. After the public hearing or hearings, the jurisdictional county legislative authority or authorities must convene a session to approve of the proposed watershed plan. In cases where there is more than one county legislative authority with jurisdiction over the WRIA or multi-WRIA planning area, the legislative authorities must convene a joint session to consider the proposed plan. A jurisdictional county legislative authority may reject the plan, but may not amend it. Under RCW 90.82.130, approval of a watershed plan can be achieved by a majority vote of the members of the jurisdictional county legislative authority, or in cases where there is more than one county legislative authority with jurisdiction over the WRIA or multi-WRIA planning area, a majority of vote of each county legislative authority.

If a proposed plan is rejected by one or more jurisdictional county legislative authority, it must be returned to the planning unit with recommendations for revisions. The approval process for a revised plan is the same as that described for the original watershed plan. If approval of the revised plan is not achieved, watershed planning under provision of Chapter 90.82 RCW terminates.

As stipulated in RCW 90.82.130, once a watershed plan is approved, actions identified within the plan to be taken by local, state, and tribal governments that impose a fiscal impact, a redeployment of resources, or a change in existing policy become “obligations” for such governments. However, obligations cannot be created by a watershed plan unless the government entity to which the obligation will apply was represented on the planning unit and the representative for the entity is on record as agreeing to the obligation.

1.5.4 Phase Four – Plan Implementation

RCW 90.82.130 stipulates that:

> . . . agencies [of state government] shall adopt by rule the obligations of both state and county governments and rules implementing the state obligations, the obligations on state agencies are binding upon adoption of the obligations into rule, and the agencies shall take other actions to fulfill their obligations as soon as possible . . . .

Obligations are also binding on counties. County legislative authorities are required to adopt any necessary implementing ordinances and take any other action necessary to fulfill obligations as soon as possible after plan approval.

Financial support for implementation activities is likely to require a combination of existing and new funding sources. The 2001 legislature directed Ecology to facilitate establishment of a panel to evaluate options for funding implementation activities and to address other potential implementation issues. The established panel, referred to as the Phase Four Watershed Plan Implementation Committee, was comprised of stakeholders, the legislature, county and city governments, tribal governments, and the public at large. The Phase Four committee provided recommendations to planning units and to the 2003 Legislature. Recommendations to planning units included the following:

- Develop detailed implementation plans within one year of management plan adoption;
- Identify potential funding sources during Phase Three planning, anticipating reviews within the context of water-resource needs in a given WRIA;
- Include provisions for management decisions, progress reviews, and revisions in implementation guidelines;
- Address the purposes of any data collection, efforts to update key data, coordination of monitoring activities, and provisions for data management; and
- Identify information needed to assess effectiveness of watershed plan activities and determine when changes are necessary.

The Phase Four committee's recommendations to the Legislature included:

- Allow planning units or successor groups to continue after adoption;
- Establish "Implementing Governments" and "Implementation Lead Agencies" to coordinate the process;
- Enable local governments to establish WRIA-wide "Water Resource Districts" by citizen vote with taxing authority, locally elected or appointed board members, and authority to administer implementation;

- Expand "obligations" to include voluntary acceptance by any government, and "rule-making" to include policies, procedures, and interlocal agreements;

- Authorize implementation grants of $100,000 per year per WRIA planning area and an extra $25,000 per year for each additional WRIA in a multi-WRIA planning area for three years after adoption. Allow for a possible two-year extension with grants of $50,000 per year. All grants would be subject to a 10-25 percent local match requirement;

- Review how state fund managers and key federal programs can support implementation;

- Consider new state-level funding for water-related infrastructure and watershed management programs;

- Provide for periodic review and amendment of adopted plans by planning units or successor groups at the discretion of initiating governments through a process involving county legislative authorities;

- Direct statewide monitoring and information systems to address a broader range of water resource information needs;

- Improve information coordination among state agencies, enhance smaller-scale monitoring capabilities, and provide better data access for watershed managers and the public; and

- Fund watershed information improvements where data limitations preclude effective management (Ecology 2003).

The final Phase Four committee report, Ecology Publication 02-06-023 dated December 2002, is available at: http://www.ecy.wa.gov/biblio/0206023.html.

Second Engrossed Second Substitute House Bill (SESSHB 1336) was enacted by the 2003 Legislature in response to the Phase Four committee report. SESSHB 1336 is intended to establish a clear statutory process for implementation of watershed plans. Some of the major provisions of this legislation are as follows:

- Funding assistance is made available to support implementation, Phase Four, of watershed plans developed under authority of chapter 90.82 RCW. Phase Four grants may be up to one hundred thousand dollars for each planning unit for each of the first three years of implementation. A two year extension may be granted at the end of the three-year period, during which an additional amount up to $50,000 may be available each year. A 10 percent match is required for the Phase Four grants and may be in the form of financial contributions or in-kind services related to watershed plan implementation. The match can be provided by the planning unit or by the combined commitments of federal agencies, tribal governments, local governments, special districts or other local jurisdictions.

- Within one year of accepting Phase Four funding, a planning unit must prepare a detailed implementation plan and submit the plan to Ecology. Submittal of the plan to Ecology is a condition of receiving funding for the second and any subsequent years of the Phase Four grant. The implementation plan must contain strategies to provide sufficient water for production agriculture; commercial, industrial, and residential use; and instream flows, as well as timelines and interim milestones for achieving those strategies. The implementation plan must clearly identify and define coordination and oversight responsibilities; any needed interlocal agreements, rules, or ordinances; any needed state or local administrative approvals and permits; and specific funding mechanisms. In developing its plan, the planning unit is required to consult with other entities planning in the watershed and to eliminate activities or policies that are duplicative or inconsistent.

- A county legislative authority is allowed to opt out of watershed planning if the county's jurisdictional territory within a WRIA or multi-WRIA planning area is less than five percent of all lands in the planning area, or if the county's jurisdictional territory within a WRIA or multi-WRIA planning area is five or more percent of all lands in the planning area and all other initiating governments within the planning area consent. A county that opts out is not bound to by obligations within the watershed plan. Even if a county opts out, other counties within the WRIA or multi-WRIA planning area may adopt the watershed plan under provisions of chapter 90.82 RCW.

- In cases where Ecology participated in a watershed plan, that department must rely on the plan as the framework for future resource management decisions within the affected watershed. In addition, Ecology must rely on the plan as a primary consideration in determining the public interest in relation to such decisions.

- Once a watershed plan is approved, Ecology can develop and adopt modifications to the plan or obligations imposed by the plan only through a negotiated rule making process similar to the process used in development of the watershed plan.

The complete text of SESSHB 1336 can be viewed online at: www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=1336.

1.5.5 Other 2003 Legislation Affecting Chapter 90.82 RCW

In addition to SESSHB 1336, two other bills were enacted by the 2003 Legislature that amended Chapter 90.82 RCW: Engrossed Senate Bill (ESB) 5343 and Second Engrossed Substitute House Bill (SESHB) 1338. ESB 5343 provides that, for purposes of watershed planning, WRIA 40 (Alkali – Squilchuck) is divided into WRIA 40a and WRIA 40b. WRIA 40a consists of the portion of the WRIA occupied by the Stemilt and Squilchuck subbasins, while WRIA 40b encompasses the remainder of the WRIA. The legislation allows for watershed planning to be conducted separately for WRIA 40a and 40b, with WRIA 40a eligible for 25 percent of all funding available for watershed planning under Chapter 90.82 RCW and WRIA 40b the remaining 75 percent. The complete text of ESB 5343 can be viewed online at: www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=5343.

SESSHB 1338 (discussed in more detail in Section 3.1.7) requires that the detailed implementation plans required under SESSHB 1336 (discussed above) address the planned future use of existing water rights for municipal water supply purposes that are **inchoate** (approved but not used). This includes consideration of how such rights will be used to meet the projected future needs identified in the watershed plan and how the use of such rights will be addressed when implementing instream flow strategies. The planning unit or other designated lead agency must ensure that holders of inchoate water rights for municipal water supply purposes are asked to participate in defining the timelines and milestones included in the implementation plan. In consultation with Ecology; the Washington State Department of Community, Trade, and Economic Development; and the Washington Department of Fish and Wildlife, the Washington State Department of Health is required to identify watersheds where further coordination is needed between public water system planning and watershed planning, and to develop a work plan for achieving such coordination. The complete text of SESSHB 1338 can be viewed online at www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=1338.

1.6 STATE RULE-MAKING PROCESS

As noted previously, under Chapter 90.82 RCW state agency rule making may be necessary to implement obligations of a watershed plan or to establish instream flows recommended as part of a watershed plan. In addition, while a watershed plan cannot directly change state agency rules, it can recommend changes to such rules.

“Rules” are agency orders, directives, or regulations and are compiled in the Washington Administrative Code (WAC). The Administrative Procedures Act (Chapter 34.05 RCW) governs the general process under which state rules are adopted; while, Chapter 1-21 WAC implements the provision Administrative Procedures Act relating to state agency rule-making.

RCW 34.05.370 stipulates that a state agency maintain a rule-making file for each rule that it proposes or adopts. The rule making file is intended to make available to the public data and other information that formed the basis for the agency’s decision to proceed with rule making and documentation indicating the agency followed the procedural requirements of the Administrative Procedures Act.

Prior to filing formal notice of proposed rule making, agencies are required to complete a **Preproposal Statement of Intent** form and file it with the state code reviser’s office. The Preproposal Statement of Intent entered on a **CR-101 form**, is intended to facilitate public comment regarding a potential rule adoption consistent with the provisions of the Administrative Procedures Act. The code reviser’s office places the filing in the State Register, the state’s official publication for notices and forms related to rule making. The State Register is printed the first and third Wednesday of each month.

Any time after 30 days from when the CR-101is published in the State Register, an agency may file a **Notice of Proposed Rule Making** with the code reviser’s office. The notice, entered on a **CR 102 form**, must be accompanied by the complete text of the proposed rule. The notice and proposed rule comprise the "notice package." The proposing agency must provide six copies of the notice package to the code reviser's office. The code reviser's office places the Notice of Proposed Rule Making and the accompanying proposed rule in the State Register.

If required, a Small Business Economic Impact Statement must be filed at the same time as the CR-102. The Regulatory Fairness Act (Chapter 19.85 RCW) requires the preparation of a Small Business Economic Impact Statement to analyze the average cost of a proposed rule on small businesses when a proposed rule imposes more than minor costs on businesses within a specific industry, or when requested by the state's Joint Administrative Rules Review Committee. A small business is defined as:

> . . . any business entity, including a sole proprietorship, corporation, partnership, or other legal entity, that is owned and operated independently from all other businesses, that has the purpose of making a profit, and that has fifty or fewer employees (RCW 19.85.020).

If it is determined that a rule places a disproportionate economic impact on small businesses, the proposing agency must mitigate the impacts to reduce the burden of the rule, if legal and feasible.

The proposing agency must also determine whether the rule will be a "Significant Legislative Rule." A Significant Legislative Rule is defined as a rule other than a procedural or interpretive rule that:

> . . . adopts substantive provisions of law pursuant to delegated legislative authority, the violation of which subjects a violator of such rule to penalty or sanction; establishes, alters, or revokes any qualification or standard for the issuance, suspension, or revocation of a license or permit; and adopts a new, or makes significant amendments to, a policy or regulatory program (RCW34.05.328).

Significant Legislative Rules are subject to additional rulemaking procedures and require a series of determinations regarding the purpose and effect of the rule (see RCW 34.05.328 for more information).

Twenty days after the CR-102 has been published in the State Register, a proposing agency can hold hearings on the proposed rule. After holding hearings, the proposing agency may file a **Rule Making Order** entered on a **CR-103 form** and signed by the agency director. The Rule Making Order must be filed no later than 180 days after publication of the CR-102. Generally, a rule becomes effective 31 days after an agency files the signed CR-103.

Except where exempted by statute, rule-making is subject to environmental review under the State Environmental Policy Act (SEPA). If a threshold determination establishes that a proposed rule is likely to have probable significant adverse impacts on the environment, a determination of significance and a request for comments of the scope of an environmental impact statement (DS/scoping notice) should be distributed at the time the CR-101 is published. The release of a draft environmental impact statement should be timed to coincide with publishing of the CR-102.

The final environmental impact statement would need to be released at least seven days prior to filing of the CR-103.

If the threshold determination indicates that a proposed rule is not likely to result in significant adverse environmental impacts, release of a determination of non-significance (DNS) should be timed to coincide with publishing of the CR-102.

1.7 SCHEDULE/STATUS OF WATERSHED PLANNING UNDER CHAPTER 90.82 RCW

Currently, 42 of the state's 62 WRIAs are represented by 33 planning units engaged in planning under Chapter 90.82 RCW. This includes eight multi-WRIA planning efforts. Watershed planning has been proposed for two additional WRIAs; however, Ecology is awaiting formal notice of intent to proceed. Table 1-1 provides a listing of those WRIAs for which watershed planning under Chapter 90.82 RCW has been initiated, the current status of the planning effort, the completion date for the watershed plan, and the elements to be included in the plan. Figure 1-1 demonstrates the location and boundaries of the state's WRIAs.

TABLE 1-1
WATERSHED PLANNING STATUS/SCHEDULE

WRIA	PLANNING PHASE	PLANNED COMPLETION DATE	PLANNING ELEMENTS (as of 12/02)			
			Water Quantity	Instream Flows	Water Quality	Habitat
#1 – Nooksack	3	4th Qtr. 2003	X	X	X	X
#2 – San Juan	3	4th Qtr. 2003	X		X	X
#3 – Lower Skagit/ #4 – Upper Skagit	3	4th Qtr. 2003	X	X		
#5 – Stillaguamish	Currently no Chapter 90.82 RCW planning					
#6 – Island	3	2nd Qtr. 2005	X			
#7 – Snohomish	Currently no Chapter 90.82 RCW planning					
#8 – Cedar – Sammamish	Currently no Chapter 90.82 RCW planning					
#9 – Duwamish – Green	Currently no Chapter 90.82 RCW planning					
#10 Puyallup	Currently no Chapter 90.82 RCW planning					
#11 – Nisqually	3	4th Qtr. 2003	X	X	X	X
#12 – Chambers – Clover	3	4th Qtr. 2004	X		X	X
#13 – Deschutes	3	4th Qtr. 2004	X	X	X	X
#14 – Kennedy – Goldsborough	3	4th Qtr. 2005	X	X	X	X
#15 – Kitsap	3	2nd Qtr. 2005	X	X	X	X
#16 – Skokomish – Dosewallips	3	4th Qtr. 2005	X	X	X	X
#17 – Quilcene – Snow	3	4th Qtr. 2004 2003	X	X	X	X
#18 – Elwha – Dungeness	3	4th Qtr. 2003	X	X	X	X
#19 – Lyre – Hoko/ #20 – Solduck-Hoh	2	3rd Qtr. 2005	X	X	X	X
#21 – Queets – Quinault	Currently no Chapter 90.82 RCW planning					
#22 – Lower Chehalis/ #23 – Upper Chehalis	3	4th Qtr. 2003	X	X	X	X

TABLE 1-1
WATERSHED PLANNING STATUS/SCHEDULE

WATER RESOURCE INVENTORY AREA	PLANNING PHASE	PLANNED COMPLETION DATE	PLANNING ELEMENTS (as of 12/31/01)			
			Water Quantity	Instream Flows	Water Quality	Habitat
#24 – Willapa	Currently no Chapter 90.82 RCW planning					
#25 – Grays – Elochoman/ #26 – Cowlitz	3	3rd Qtr. 2004	X	X	X	X
#27 – Lewis/ #28 – Salmon – Washougal	3	3rd Qtr. 2004	X	X	X	X
#29 – Wind – White Salmon	2	2nd Qtr. 2005	X		X	X
#30 – Klickitat	3	2nd Qtr. 2005	X		X	X
#31 – Rock – Glade	1	To be determined	X	To be determined		
#32 – Walla Walla	3	3rd Qtr. 2005	X	X	X	X
#33 – Lower Snake	Currently no Chapter 90.82 RCW planning					
#34 – Palouse	1	To be determined	X	To be determined		
#35 – Middle Snake	1	To be determined	X	To be determined		
#36 – Esquatzel Coulee	Currently no Chapter 90.82 RCW planning					
#37 – Lower Yakima/ #38 – Naches/ #39 – Upper Yakima	3	Completed 4th Qtr. 2002	X		X	X
#40 – Alkali – Squilchuck*	Currently no Chapter 90.82 RCW planning					
#41 – Lower Crab Creek	Currently no Chapter 90.82 RCW planning					
#42 – Grand Coulee	Currently no Chapter 90.82 RCW planning					
#43 – Upper Crab/Wilson Creek	2	3rd Qtr. 2006	X	X	X	X
#44 – Moses Coulee/ #50 – Foster Creek	3	3rd Qtr. 2004	X	X	X	X
#45 – Wenatchee	2	2nd Qtr. 2006	X	X	X	X
#46 – Entiat	3	4th Qtr. 2003	X	X	X	X

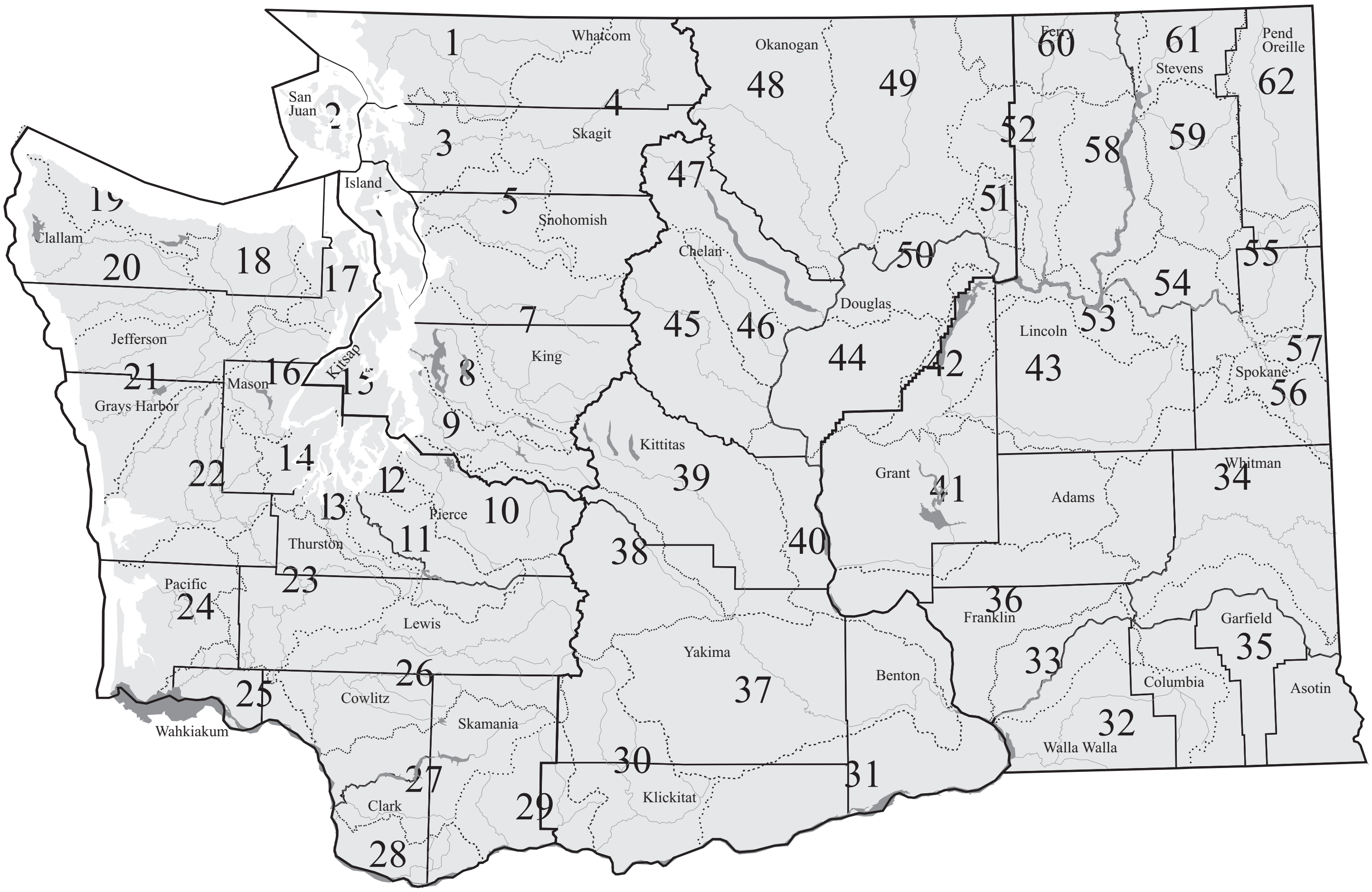
TABLE 1-1
WATERSHED PLANNING STATUS/SCHEDULE

WATER RESOURCE INVENTORY AREA	PLANNING PHASE	PLANNED COMPLETION DATE	PLANNING ELEMENTS (as of 12/31/01)			
			Water Quantity	Instream Flow	Water Quality	Habitat
#47 – Chelan	Currently no Chapter 90.82 RCW planning					
#48 – Methow	3	4th Qtr. 2003	X		X	X
#49 – Okanogan	Currently no Chapter 90.82 RCW planning					
#51 – Nespelum	Currently no Chapter 90.82 RCW planning					
#52 – Sanpoil	Currently no Chapter 90.82 RCW planning					
#53 – Lower Lake Roosevelt	Currently no Chapter 90.82 RCW planning					
#54 – Lower Spokane	Currently no Chapter 90.82 RCW planning					
#55 – Little Spokane/ #57 – Middle Spokane	3	1st Qtr. 2004	X	X	X	X
#56 – Hangman	3	4th Qtr. 2004	X	X	X	X
#58 – Middle Lake Roosevelt	Currently no Chapter 90.82 RCW planning					
#59 – Colville	3	4th Qtr. 2004	X		X	
#60 – Kettle	2	2nd Qtr. 2006	X	X		
#61 – Upper Lake Roosevelt	Currently no Chapter 90.82 RCW planning					
#62 – Pend Oreille	3	3rd Qtr. 2004	X		X	X

*As discussed in Section 1.5.5 above, for purposes of watershed planning, the 2003 Legislature divided WRIA 40 into WRIA 40a and 40b.

Note: Supplemental grants for multipurpose storage assessments have been awarded to planning units for six planning areas including: Kisap (WRIA 15); Elwah/Dungeness (WRIA 18); Lower Chehalis/Upper Chehalis (WRIAs 22 and 23); Walla Walla (WRIA 32); Upper Yakima/Naches/ Lower Yakima (WRIAs 37, 38, and 39); and Colville (WRIA 59).

FIGURE 1-1
WRIA MAP



1.8 OVERVIEW OF WATERSHED PLANNING ENVIRONMENTAL IMPACT STATEMENT

The Watershed Planning Environmental Impact Statement is intended to assist decision makers in identifying and analyzing probable adverse environmental impacts and possible mitigation measures associated with the development and approval of watershed plans under the Watershed Planning Act (Chapter 90.82 RCW) and rule making by state agencies that may be undertaken to support implementation of such plans. The environmental impact statement provides background information regarding:

- The watershed planning process specified in Chapter 90.82 RCW and the current status of watershed planning efforts around the state (Chapter 1);

- Pathways for compliance with the State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) for watershed plans and rule making (Chapter 2);

- Laws, regulations, and programs relating to water quantity, instream flow, water quality, and habitat (Chapter 3); and

- Washington's natural and built environments to provide context for the environmental analysis (Chapter 4).

The environmental impact statement provides numerous examples of possible recommended actions (alternatives) that may be included as part of local watershed plans to meet the objectives of Chapter 90.82 RCW and/or objectives of the local planning process (Chapter 5). The alternatives were identified in consultation with planning units, watershed planning lead agencies, consultants for watershed planning units, and Ecology watershed leads. Alternatives are identified for each of the four components of watershed planning: water quantity; instream flow; water quality; and habitat. Alternatives identified for water quantity can be categorized generally as those that:

- Promote water use efficiency;

- Effectively manage allocation and use of water resources through legal mechanisms; and

- Develop or improve water resources storage infrastructure.

In addition, a no action alternative regarding water quantity is evaluated.

For instream flow, an alternative that requests Ecology to set instream flows for protection and/or restoration by administrative rule is identified as well as a no action alternative. Three general categories of water quality alternatives are identified in addition to a no action alternative:

- Improve point source pollution control;
- Improve nonpoint source pollution control; and
- Modify land/shoreline use activities to protect, preserve, or enhance water quality.

For habitat, the following five general categories of potential recommended actions are identified in addition to a no action alternative:

- Conduct instream modifications to fish habitat;
- Conduct out-of-stream modifications to riparian habitat;
- Modify land and shoreline use to protect, preserve, or enhance habitat;
- Improve or enhance hatchery operations, and
- Improve forest practices.

The environmental impact statement concludes with an evaluation of the potential significant adverse environmental impacts and possible mitigation measures associated with each of the identified alternatives (Chapter 6).

1.9 ENVIRONMENTAL IMPACT STATEMENT SCOPING

On January 29, 2002, Ecology circulated a **Determination of Significance (DS)** and a request for comments on the scope of the environmental impact statement for Watershed Planning under Chapter 90.82 RCW (hereafter referred to as the watershed planning environmental impact statement). The DS and scoping notice were mailed to approximately 500 agencies, affected tribes, and members of the public. In addition, legal notices were placed in 16 newspapers around the state of Washington including: *The Daily World* (Aberdeen), *The Bellingham Herald*, *The Sun* (Bremerton), *The Statesman Examiner* (Colville), *The Herald* (Everett), the *Skagit Valley Herald*, *The Olympian*, the *Tri-City Herald*, *The Chronicle* (Omak), the *Daily Journal of Commerce*, the *Spokesman Review* (Spokane), the *Tacoma News Tribune*, *The Columbian* (Vancouver), the *Wenatchee World*, the *Yakima Herald-Republic*, and the *Union Bulletin* (Walla Walla).

Although the official comment period was 21 days in duration, comments regarding the scope were accepted by Ecology throughout the approximately one-year draft watershed planning environmental impact statement preparation period. In the DS and scoping notice, the following were identified for discussion in the draft watershed planning environmental impact statement:

Water Quantity Component

- Impacts to public services and utilities associated with implementation of municipal conservation programs.

- Short-term impacts to earth, air, and environmental health from construction activities associated with agricultural water conservation and irrigation efficiency efforts.

- Long-term impacts to microclimates, ground water recharge, surface water temperature, plants and animals, and land and shoreline use associated with agricultural water conservation and irrigation efficiency efforts.

- Impacts to publicly owned wastewater treatment facilities associated with industrial conservation measures.

- Long-term impacts to land use, aesthetics, and ground water recharge associated with voluntary transfers of water and changes in water use.

- Short-term impacts to earth, air, surface water, plants and animals, environmental health, and traffic associated with construction of water reclamation and reuse facilities.

- Impacts to ground and surface water quality and quantity, land and shoreline use, and public health associated with operation of water reclamation and reuse facilities.

- Short-term impacts to earth, air, surface water, plants and animals, environmental health, and traffic associated with construction of new on-channel or off-channel storage facilities, raising of existing storage facilities, or implementing artificial recharge/aquifer storage projects.

- Seismic effects and impacts to stream ecology, wildlife habitat, land and shoreline use, and energy associated with operation of new on-channel or off-channel storage facilities, or raised existing storage facilities.

- Short-term and long-term impacts to surface water quality, recreation, aesthetics, and public services and utilities associated with installation, operation, and maintenance of water quantity monitoring devices.

Instream Flow Component

- Long-term impacts to surface water, ground water, land and shoreline use, aesthetics, recreation, and cultural resources associated with setting of instream flows and with implementation of actions intended to achieve instream flows once set.

Water Quality Component

- Short-term and long-term impacts to surface water quality, recreation, and public services and utilities associated with development and operation of monitoring programs, including installation and maintenance of monitoring devices.

- Long-term impacts to land and shoreline use associated with modifications to comprehensive plans, shoreline master programs, critical areas ordinances, stormwater plans, and on-site sewage regulations intended to reduce nonpoint pollution and to implement total mass daily loads established for federal 303 (d) listed water bodies.

Habitat Component

- Short-term construction related impacts to earth, air, surface water, plants and animals, environmental health, and traffic associated with placement of instream structures, riparian restoration projects, and removal of fish passage obstructions.

- Impacts to recreation and aesthetics associated with placement of instream structures and riparian restoration projects.

- Long-term impacts to traffic and public services and utilities associated with removal of fish passage obstructions such as bridges, culverts, and roadways.

In addition to the aforementioned issues, a number of additional issues were raised by agencies, affected tribes, and the public in scoping comments. These issues include the following:

General Comments

- Impacts to state resource agencies associated with implementation of watershed plans should be evaluated.

Water Quantity Component

- The relationship between the availability of water and the assumptions upon which comprehensive land use plans are based should be considered. If water assumed to be available to support planned growth is determined to be unavailable, comprehensive plans may need to be modified to reduce intensity of development or reduce the size of designated Urban Growth Areas.

- Global warming and climate change should be considered by planning units when evaluating future planning options for water quantity.

- Reduced availability of water associated with increased diversions of surface water may result in long-term impacts to wildlife.

Instream Flow Component

- Reductions in instream flow will result in reductions in habitat structure and will impact use of wildlife corridors.

- Low instream flows will adversely impact resident fish species.

Water Quality Component

- Seawater intrusion represents a concern for some water supply development options. Localized contamination may be exacerbated by additional water supply development or increased withdrawals of ground water. Projects in coastal areas intended to reduce leakage from irrigation systems may induce seawater intrusion by reducing freshwater recharge.

- Ground water quality may be adversely affected by artificial recharge and storage projects.

Habitat Component

- The science behind requirements for preservation of riparian corridors should be analyzed.

- The placement of instream structures such as large woody debris may cause flooding of upstream and adjacent properties.

CHAPTER 1 REFERENCES

State laws (RCWs) can be viewed at http://www.leg.wa.gov/ws/adm/rcw.cfm.

State rules and regulations (WACs) can be viewed at http://leg.wa.gov/wac.

Washington State Department of Ecology (Ecology). Status of Watershed Planning Efforts in Washington State. Publication 03-06-010. January 2003.

The Department of Agriculture; the Conservation Commission; the Department of Community, Trade, and Economic Development; the Department of Ecology; the Department of Fish and Wildlife; the Department of Health; the Department of Natural Resources; the Department of Transportation; the Interagency Committee for Outdoor Recreation; the Puget Sound Water Quality Action Team; the Salmon Recovery Office within the Governor's Office; and the Parks and Recreation Commission. Memorandum of Understanding for the Coordinated Implementation of Chapter 247, Laws of 1998: Watershed Management (Engrossed Substitute House Bill 2514), and Chapter 246, Laws of 1998: Salmon Recovery Planning (Engrossed Substitute House Bill 2496), By the Participating Agencies of the State of Washington. http://www.ecy.wa.gov/watershed/MOU.html. September 1998.

CHAPTER 2.0
STATE ENVIRONMENTAL POLICY ACT AND NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE FOR WATERSHED PLANS

The watershed planning environmental impact statement is intended to serve two purposes:

- To assist local planning units, lead agencies, and legislative authorities in satisfying State Environmental Policy Act (SEPA) environmental review requirements necessary for approval of individual watershed plans prepared under authority of Chapter 90.82 RCW; and

- To assist state agencies in satisfying SEPA environmental review requirements for any rule making that may be needed to implement individual watershed plans, including instream flow rules.

This section focuses on the former purpose: how this document can assist in local approval processes for individual watershed plans. It also provides a discussion of the National Environmental Policy Act (NEPA) in relationship to watershed plans.

2.1 INTRODUCTION TO STATE ENVIRONMENTAL POLCY ACT

Prior to discussing how this document can be used at the local level, it is useful to introduce the State Environmental Policy Act (SEPA) and the rules developed under authority of SEPA, define some basic SEPA terms, and briefly describe fundamental SEPA processes.

A number of guidance documents are available on Ecology's website that provide additional information regarding SEPA requirements and procedures. These documents include, but are not limited to:

- *SEPA Handbook*, http://www.ecy.wa.gov/programs/sea/sepa/handbk.htm;

- *SEPA Guide to Project Applicants Online*, http://www.ecy.wa.gov/programs/sea/sepa/apguide/sepa_guide_for project_applicant.htm; and

- *Citizen's Guide to SEPA Review and Comment*, http://www.ecy.wa.gov/programs/sea/sepa/citizensguide/citizensguide.htm.

SEPA (Chapter 43.21C RCW) was enacted by the legislature to ensure that state and local agencies consider the likely environmental consequences of proposed actions during decision making processes concerning such actions. The SEPA review process is intended to provide information to agencies, applicants, and the public to encourage the development of environmentally sound proposals (Ecology 1998).

SEPA also authorizes Ecology to adopt rules for interpretation and implementation of the act (RCW 43.21C.110). The **SEPA Rules (Chapter 197-11 WAC)** provide state and local agencies with specific requirements for implementing SEPA, including procedures for evaluating a proposal and documenting the analysis. **Agencies** are defined as:

> . . . any state or local governmental body, board, commission, department, or officer authorized to make law, hear contested cases, or otherwise take actions . . . , except the judiciary and the state legislature. An agency is any state agency or local agency (WAC 197-11-714).

The SEPA Rules require agencies to:

- Identify and evaluate the probable impacts of a proposed action, reasonable alternatives to the proposed action, and mitigation measures before committing to a particular course of action;

- Integrate the SEPA process with planning, permitting, and licensing processes so that such processes run concurrently rather than consecutively;

- Integrate SEPA as early as possible in a planning, permitting, or licensing processes to ensure that they reflect environmental values, to avoid later delays in such processes, and to gain early resolution of identified problems; and

- Prepare environmental documents that are concise, clear, and to the point (Ecology 1998).

Actions are defined in the SEPA rules as:

> . . . (a) New and continuing activities (including projects and programs) entirely or partly financed, assisted, conducted, regulated, licensed, or approved by agencies;
>
> (b) New or revised agency rules, regulations, plans, policies, or procedures; and
>
> (c) Legislative proposals (WAC 197-11-704).

As will be discussed in more detail below, actions can be **project actions** or **nonproject actions**. Project actions include agency decisions regarding new construction, demolition, purchase, sale, or exchange of natural resources. Nonproject actions include agency decisions regarding plans, rules, or regulations (Ecology 1998).

In determining whether a proposed project or activity (proposal) is subject to environmental review under SEPA,

- The entire proposal must be defined;

- Any agency actions necessary to facilitate or allow the proposal, including permits, licenses, approvals, must be identified; and

- The proposal must be evaluated to determine if it is categorically exempt from SEPA review based on the provisions of WAC 197-11-800 thru 880 (Ecology 1998).

If a proposal requires agency actions and is not categorically exempt, SEPA environmental review must be conducted. The initial step in the environmental review process is the identification of the **SEPA lead agency**. The SEPA lead agency is the agency with the main responsibility for complying with SEPA's procedural requirements (WAC 197-11-758). When an agency initiates a proposal, it is the lead agency for that proposal. When two or more agencies share in the implementation of a proposal, the agencies will, by agreement, determine which agency will serve as the lead agency (WAC 197-11-926). This provision applies to WRIA or multi-WRIA planning areas under the jurisdiction of more than one county legislative authority.

Once the lead agency is determined, that agency must review the proposal to evaluate its probable significant adverse environmental impacts. In most cases, the principal tool used in the evaluation of probable significant adverse environmental impacts is an environmental checklist. The environmental checklist is a document usually completed by the proponent of a proposal that provides information about the proposal and possible mitigation measures intended to assist the SEPA lead agency in making a **threshold determination**. A threshold determination is the decision by the SEPA lead agency as to whether the proposal and its identified mitigation measures will result in probable significant adverse environmental impacts and whether an **environmental impact statement** is required.

The lead agency will issue a **determination of nonsignificance**, with or without mitigation conditions, if it determines that the proposal will not result in probable significant adverse environmental impacts. However, if the lead agency determines that the proposal will likely have significant adverse environmental impacts, it will issue a **determination of significance/ scoping notice**, which initiates the environmental impact statement process. A determination of significance/scoping notice can be issued without preparation of an environmental checklist for public (government) proposals when the SEPA lead agency decides to prepare its own environmental impact statement. Similarly, preparation of the checklist can be waived if the proponent and the SEPA lead agency agree that an environmental impact statement must be prepared (WAC 197-11-310 thru 330).

2.2 HOW TO USE THE WATERSHED PLANNING ENVIRONMENTAL IMPACT STATEMENT IN LOCAL APPROVAL PROCESSES

This document is a **statewide, nonproject** environmental impact statement. Under the SEPA Rules (Chapter 197-11 WAC), nonproject actions are governmental actions involving decisions on policies, plans, or programs. Such actions can include:

- The adoption of comprehensive plans or zoning ordinances;

- The adoption or amendment of policies, programs, or plans, such as watershed plans under Chapter 90.82 RCW, that will govern the development of a series of connected actions; or

- The adoption or amendment of legislation, ordinances, rules, or regulations that contain standards controlling the use or modifications of the environment (WAC 197-11-704).

Any proposal that meets the definition of a nonproject action must be reviewed under SEPA, unless specifically exempted.

When SEPA environmental review is applied to planning documents, such review forms the basis for later project level review as individual elements of a plan are implemented. Watershed plans developed under Chapter 90.82 RCW would typically be comprised of a series of related project actions. Generally, if thorough environmental review occurs at the broad nonproject level, project level review for individual actions can be focused on those environmental issues not addressed at the nonproject stage. The same is true of recommendations for individual nonproject actions contained within a watershed plan such as adoption or modification of ordinances, rules, or regulations and specific changes to existing comprehensive plans, water or sewer general plans, or other planning documents undertaken in response to a watershed plan.

As a statewide document, the watershed planning environmental impact statement does **not** contain site specific information concerning individual watersheds within which watershed planning is occurring under Chapter 90.82 RCW. It does, however, provide basic information to local decision makers concerning:

- The provisions and procedural requirements of the Watershed Planning Act (Chapter 90.82 RCW) (see Chapter 1);

- Laws, regulations, and programs that bear some relationship to planning conducted under the Watershed Planning Act (see Chapter 3);

- A general description of the state of Washington's natural and built environments to provide context for the environmental analysis of alternatives (see Chapter 4);

- Examples of possible recommended actions (alternatives) that may be included as part of local watershed plans to meet the objectives of the Watershed Planning Act and/or objectives of the local planning process (see Chapter 5); and

- Potential significant adverse environmental impacts and mitigation measures that would likely be associated with the examples of recommended actions (see Chapter 6).

The watershed planning environmental impact statement is intended to **assist** local decision makers in meeting SEPA requirements, but will not eliminate the need for local decision makers to comply with SEPA. The SEPA rules allow for **adoption** of existing environmental documents that analyze all or part of the environmental impacts of a proposal (WAC 197-11-600). In this context, the statewide, nonproject watershed planning environmental impact statement can be adopted by a SEPA lead agency (see Section 2.1 above for a discussion of SEPA lead agency) to meet part or all of its responsibility to prepare an environmental impact statement or other environmental document. Sample adoption notices are contained in Appendix D of the *SEPA Handbook* (link provided above in Section 2.1 above).

Under the SEPA rules:

> . . . the agency adopting an existing environmental document must independently review the content of the document and determine that it meets the adopting agency's environmental review Standards and needs for the proposal. However, a document is not required to meet the adopting agency's own procedures for the preparation of environmental documents (such as circulation, commenting, and hearing requirements) to be adopted (WAC 197-11-630).

Based upon the independent review of the statewide, nonproject watershed planning environmental impact statement, a SEPA lead agency may want to consider any of a number of courses of action:

- An **Adoption and Determination of Significance (DS)** could be issued if it is determined that the statewide document adequately addresses the probable significant adverse impacts associated with the recommended actions contained in the watershed plan. A copy of the adoption notice and DS must be circulated to Ecology, agencies with jurisdiction, and interested parties, but neither a comment period nor public notice is required. There is a seven day waiting period before action can be taken to approve the watershed plan (WAC 197-11-630).

- An **Adoption, Determination of Significance (DS) and Addendum** could be prepared and issued if it is determined that the statewide document adequately addresses the probable significant adverse impacts associated with the recommended actions contained in the watershed plan, but there is a need to provide local decision makers with additional minor information regarding the plan. For example, an addendum could provide background information concerning the natural and built environments within the watershed. The same procedures as that described for Adoption and DS would apply, except that the addendum would be circulated with the adoption notice and DS.

- An **Adoption and Supplemental Environmental Impact Statement** could be prepared and issued if it is determined that the statewide document addresses some, but not all, of the probable significant adverse environmental impacts associated with the local watershed plan and there is a need to conduct additional environmental analyses. The notice of adoption is included in the supplemental environmental impact statement. The SEPA lead agency is not required to conduct scoping prior to preparation of the supplemental environmental impact statement, but may opt to do so (WAC 197-11-620). Copies of a **draft** supplemental environmental impact statement must be circulated to Ecology, agencies with jurisdiction, tribes, and interested parties for a minimum 30-day comment period (WAC 197-11-455). Public notice of the availability of the draft supplemental environmental impact statement must be given consistent with provisions of WAC 197-11-510. The SEPA lead agency must then prepare and circulate a **final** supplemental environmental impact statement that responds to comments received regarding the draft document, make appropriate modifications to the supplemental environmental impact statement, and provide any necessary additional environmental analyses. After release of the final supplemental environmental impact statement, there is a seven day waiting period before action can be taken to approve the watershed plan.

- An **Adoption and Determination of Non-Significance (DNS)** could be issued if it is determined that there are no probable significant adverse impacts associated with the recommended actions contained in the watershed plan. Copies of adoption notice and DNS must be circulated to Ecology, agencies with jurisdiction, tribes, and interested parties in accordance with the requirements in WAC 197-11-340. Action cannot be taken to approve the watershed plan for 14 days following release of the adoption notice and DNS.

It should be noted that while local planning units, lead agencies, and county legislative authorities are encouraged to use the statewide watershed planning environmental impact statement to help streamline their watershed plan adoption process, they are <u>not</u> required to use this document in their SEPA procedures. Local planning units, lead agencies, and county legislative may choose to develop environmental documents independent of the statewide watershed planning environmental impact statement to satisfy SEPA requirements prior to plan approval.

2.3 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

All actions by federal agencies that potentially affect the environment must comply with the National Environmental Policy Act (NEPA). If an action proposed by a local watershed planning unit entails participation by a federal agency (through action, funding, or permitting), it may be necessary to comply with NEPA as well as the State Environmental Policy Act (SEPA). This section briefly addresses 1) how a proposed watershed management action could trigger a requirement for NEPA compliance, and 2) the general process for coordinating NEPA compliance with the federal lead agency.

2.3.1 Triggering NEPA

A watershed management action would trigger a requirement for NEPA compliance under the following circumstances.

- **Action by a federal agency is required** – If an action recommended by a local planning unit involves an action by a federal agency, or if an action is proposed on federal land, NEPA compliance would be required. The local planning unit must coordinate the recommended action with the jurisdictional federal agency, and the federal agency must to agree to its part of the recommended action. For example, a joint project between the U.S. Forest Service and owners of adjacent non-federal land to improve fish passage by replacing impassible culverts on stretches of a stream that flows through both National Forest and non-federal land would trigger NEPA. The U.S. Forest Service would be responsible for NEPA compliance (and funding) for the portion of the project within the National Forest. However, it would be in the local planning unit's best interests to assist the Forest Service in complying with NEPA (see Section 2.3.2 below). Other federal agencies that may undertake an action in response to recommendations of a watershed plan, or manage federal lands that may be affected by such recommendations include the Bureau of Reclamation, Bureau of Land Management, and the National Park Service.

- **Permit or approval from a federal agency is required** – Actions by private parties or non-federal agencies often require an approval or permit from a federal agency. Before issuing such approvals or permits, the approving federal agency must comply with NEPA. For watershed management projects, one typical federal approval may be a permit from the Army Corps of Engineers under Section 404 of the Clean Water Act. Section 404 regulates the discharge of dredged or fill material into waters of the U.S., which include most rivers, streams and wetlands. Projects involving construction in such waters include actions that meet the technical definition of discharge of dredged or fill material. Another potentially required approval is a permit under Section 10 of the Rivers and Harbors Act from the Army Corps of Engineers. This permit is required for any action affecting navigable waters of the U.S. The Army Corps of Engineers normally evaluates and issues Section 404 and Section 10 permits jointly. For major projects involving the issuance of individual permits, the Army Corps of Engineers will use information provided by the project proponent in the permit application to prepare any required NEPA documents. Approvals of the Federal Energy Regulatory Commission (FERC) are also subject to environmental review under NEPA and may require preparation of NEPA documents.

- **Federal funding is involved** – NEPA compliance is also required for actions that are at least partially funded by a federal agency, as long as the federal agency has some control over the use of the funds. An example would be federal funding for a Washington State Department of Transportation project to replace bridges or culverts to remove channel constrictions that impede fish passage. In this case, the funding federal agency would also be responsible for NEPA compliance. However, the Council on Environmental Quality's (CEQ) regulations (regulations that implement NEPA) state that NEPA compliance is not required for:

  > " . . . funding assistance solely in the form of general sharing funds, distributed under the State and Local Assistance Act of 1972 . . . with no federal agency control over the subsequent use of such funds" (40 CFR Section 1508).

2.3.2 Complying with NEPA

While complying with NEPA is the responsibility of the federal lead agency, proposed projects may be expedited if the local planning unit assists the federal agency in this compliance. This section provides a brief overview of the NEPA process and points of possible coordination with the SEPA process.

- **Identify the federal lead agency –** The federal lead agency is the agency responsible for the federal action, approval/permitting, or funding that triggers the requirement for NEPA compliance. In cases where more than one federal agency is taking action, providing approvals/permits, or funding the project, the federal agencies must decide among themselves which agency has the largest role and should be the lead federal agency. The local planning unit should identify and contact the lead federal agency about NEPA compliance at the earliest possible date (for example, in the early planning phases of the project). In joint projects involving a federal agency, coordination with the federal agency will usually begin in the very early planning stages, even before NEPA compliance begins in earnest.

- **Cooperate with the federal lead agency in complying with NEPA -** Compliance with NEPA entails a number of steps. Cooperation and coordination with the federal lead agency may streamline the process. The steps are discussed below.

  Define the federal action. The first step in NEPA compliance is to define the federal action. This may be obvious in some cases but not in others. For example, in a joint local/federal project, the federal action may be only the federal portion of the project, as in the example of culvert replacements on stream reaches on federal lands. NEPA compliance would only be required for the federal portion of the project. Impacts of the non-federal portions of the project would probably be discussed as cumulative or indirect impacts of the federal action. In the case of federal funding for a non-federal project (for example, a Washington State Department of Transportation project to replace culverts or bridges to improve fish passage), the action would probably be the entire project. In any case, the project will have to be defined in sufficient detail for the environmental impacts of the project to be determined.

  Determine the level of NEPA compliance required. The next step in NEPA compliance is for the federal lead agency to determine which level of NEPA compliance is appropriate. There are three levels of NEPA compliance: categorical exclusion, environmental assessment, and environmental impact statement. These are described in the subsequent paragraphs.

  Certain types of actions that typically have negligible environmental impacts do not require detailed environmental documentation under NEPA. Each federal agency has identified categories of actions in their purview that have negligible environmental impacts and are thus exempt from further NEPA compliance. These are called c**ategorical exclusions**. If the proposed federal action falls within one of these categories, it should be identified as a categorical exclusion; and additional NEPA documentation is not necessary. This is equivalent to a categorical exemption under SEPA.

The next level is the **environmental assessment** (EA). An environmental assessment is an environmental analysis document of moderate detail that is used to determine whether a proposed action has a potential for significant adverse impacts. The environmental assessment is the equivalent of a SEPA checklist, although an environmental assessment is usually in the form of a standard report rather than a checklist. Unlike a SEPA checklist, an environmental assessment analyzes alternatives to the proposed action. It is like a "mini-environmental impact statement" in that it contains sections describing the affected environment (existing conditions), impacts, and mitigation measures. If the environmental assessment indicates that the project will have no significant environmental impacts, a **finding of no significant impact** (FONSI) is prepared by the federal agency. A finding of no significant impact is the equivalent of the SEPA determination of non-significance (DNS). If the environmental assessment concludes there is a potential for the project to have significant impacts, the federal agency must proceed to the third level and prepare an **environmental impact statement**. If the federal agency determines that a project is likely to have significant impacts, it can proceed directly to preparation of an environmental impact statement without first preparing an environmental assessment.

As soon as possible after the decision has been made that an environmental impact statement is required, the lead agency must publish a Notice of Intent to prepare an environmental impact statement and initiate the scoping process. A NEPA environmental impact statement is a detailed document that evaluates the potential impacts of the proposed action and alternatives to the proposed action, which would achieve the basic purpose of the proposed action. An environmental impact statement describes the affected environment, the expected impacts of the proposed action and each alternative, measures to mitigate any adverse impacts, and other related topics. NEPA specifies a public review process for environmental impact statements, which includes publication of a draft environmental impact statement for public review, followed by response to public comments and preparation of a final environmental impact statement. For projects that are the subject of an environmental impact statement, the lead federal agency prepares a **record of decision** (ROD) after the environmental impact statement is finalized to document the agency's decision whether or not to implement the project. A NEPA environmental impact statement is equivalent to a SEPA environmental impact statement, although there are some differences as discussed below.

Determine whether joint NEPA/SEPA document should be prepared. The NEPA implementing regulations (Council on Environmental Quality regulations, 40 CFR 1500-1508) allow federal agencies to cooperate with state agencies in joint compliance with NEPA and equivalent state laws such as SEPA. This includes preparation of joint environmental assessments or environmental impact statements that meet the requirements of both NEPA and the equivalent state law. Many joint NEPA/SEPA environmental impact statements have been prepared in Washington. In such cases, the environmental review of the project and documents occurs jointly for NEPA and SEPA. If SEPA documentation is required for a project with federal involvement, the SEPA lead agency should communicate with the federal lead agency early in the project to determine whether a joint NEPA/SEPA compliance process would simplify the environmental review for the project.

The purpose, format and content of environmental impact statements prepared under NEPA and SEPA are similar. However, NEPA requires that environmental impact statements address several topics not required by SEPA including the irreversible and irretrievable commitments of resources resulting from the proposed action, and environmental justice issues.

NEPA environmental impact statements must also identify unavoidable adverse impacts, a requirement of SEPA as well. In addition, NEPA environmental impact statements are required to address the cumulative impacts of the proposed action in conjunction with the impacts of other actions in the project area in the past, present, and reasonably foreseeable future. This requirement is less clear under SEPA. Conversely, the requirement to address socioeconomic impacts is clearer under SEPA; thus, such impacts are often given more importance in SEPA environmental impact statements than in NEPA environmental impact statements. As described below, there are other minor differences between NEPA and SEPA environmental impact statements at the document preparation stage.

Determine whether federal lead agency can adopt an existing SEPA document for the project. The Council on Environmental Quality's NEPA regulations are silent on adopting state environmental documents to achieve NEPA compliance. However, if a SEPA document has already been prepared for a project with federal involvement, the local planning unit and federal lead agency should evaluate the possibility of achieving NEPA compliance by adoption of the SEPA document as the NEPA document. Naturally, this would only be possible if the SEPA document meets the requirements of NEPA. There have been numerous instances in Washington of state or local agencies adopting NEPA documents for SEPA compliance. If a NEPA document has already been prepared for a joint project and it addresses the entire project, the local planning unit should consider adopting the NEPA document to achieve SEPA compliance (WAC 197-11-610).

Prepare the required environmental documentation. Once the appropriate type of environmental document for NEPA compliance has been identified, the federal lead agency must prepare that document. The local planning unit should cooperate by providing project information, technical or environmental information, and administrative coordination, as appropriate. It might even be appropriate for the federal agency to fund the local agency to prepare some sections of the NEPA document. If a joint NEPA/SEPA document is to be prepared, the NEPA and SEPA lead agencies will be equal partners in preparing the document and ensuring that the appropriate public review is accomplished.

Accomplish NEPA-required public notification and review. Council on Environmental Quality's NEPA regulations have specific requirements for public notification and review for federal actions and related environmental documents. These requirements are similar to those under SEPA and include public notification of important events (for example, public meetings, hearings, and document availability), public scoping of NEPA documents, and soliciting comments from the public, agencies, and tribes. Each federal agency has adopted regulations for public involvement based on the general guidance provided in the Council on Environmental Quality regulations. Typically, scoping and public hearings are required only for environmental impact statements. For environmental impact statements, federal agencies are also required to publish a **notice of intent (NOI)** to prepare an environmental impact statement for a proposed project in the Federal Register. Notice of availability of an environmental assessment and finding of no significant impact are usually published in a local newspaper.

NEPA environmental impact statements must be filed with the Environmental Protection Agency and Council on Environmental Quality in Washington, D.C. The Council on Environmental Quality's NEPA regulations specify the length of review times for draft and final environmental impact statements, as well as restrictions on actions that can be taken before the required reviews are completed. The local planning unit should coordinate closely with the federal lead agency in meeting the NEPA requirements for public involvement.

Publish Record of Decision. Once a NEPA environmental impact statement is finalized, the lead federal agency must publish a record of decision in the Federal Register. The record of decision must state the decision, the alternatives to the selected action that were considered, the factors that lead to the decision, the environmental consequences of the proposed action, and means to avoid or reduce impacts.

CHAPTER 2 REFERENCES

The Council on Environmental Quality's Regulations for Implementing NEPA can be viewed by clicking on the "CEQ NEPAnet" link at http://ceq.eh.doe.gov/ntf.

State laws (RCWs) can be viewed at http://www.leg.wa.gov/ws/adm/rcw.cfm.

State rules and regulations (WACs) can be viewed at http://leg.wa.gov/wac.

Washington State Department of Ecology (Ecology). *SEPA Handbook*. Publication Number 98-114. 1998

CHAPTER 3.0
LAWS, REGULATIONS, AND PROGRAMS RELATED TO WATERSHED PLANNING UNDER 90.82 RCW

This section describes various laws, regulations, and programs that are related to watershed planning under Chapter 90.82 RCW. It is not an exhaustive list; rather it represents the most significant of such laws, regulations, and programs on a statewide level. The section begins with a discussion of the laws, regulations, and programs related to each of the four components of watershed planning under Chapter 90.82 RCW, Water Quantity, Instream Flow, Water Quality, and Habitat, followed by a discussion of the state's framework for land and shoreline use planning. It should be noted that laws, regulations, and programs are subject to change over time. The descriptions of laws, regulations, and programs contained in this section are based on those in effect on the publication date of this environmental impact statement.

3.1 WATER QUANTITY

Decision making concerning water quantity in the state of Washington is primarily governed by three state laws: Water Resources Act of 1971 (Chapter 90.54 RCW), the Water Code (Chapter 90.03 RCW), and the Regulation of Public Ground Waters Act (Chapter 90.44 RCW). These and other selected laws, regulations, and programs pertaining to water quantity are discussed in this section.

3.1.1 Water Resources Act of 1971 (Chapter 90.54 RCW)

The Water Resources Act of 1971 (Chapter 90.54 RCW) outlines the guiding principals for water resource management in Washington State. Although it presented in the Water Quantity portion of this chapter, its provisions also apply to instream flow, water quality, and habitat components of Watershed planning under Chapter 90.82 RCW.

The purpose of the Water Resources Act of 1971 is to set forth the fundamentals of state water resource policy to ensure that the waters of the state are protected and fully utilized for the greatest benefit to the people of the state of Washington and to provide direction to the Department of Ecology and other state agencies as well as local governments in carrying out water and water-related resource programs (RCW 90.54.010). These fundamentals guide the utilization and management of the waters of the state and provide the underlying framework for watershed plans prepared under Chapter 90.82 RCW. The fundamentals include the following:

Beneficial Uses. Uses of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational and thermal production purposes; preservation of environmental and aesthetic values; and all other uses that are compatible with the enjoyment of public waters of the state are declared to be beneficial.

Water Allocation. Allocation of waters among potential uses and users must be generally based on securing the maximum net benefits for the people of the state. Maximum net benefits shall constitute total benefits minus costs including opportunity costs (water allocated for one purpose may not be available for another).

Instream Resources. Perennial rivers and streams of the state must be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental values as well as navigational values. Similarly, lakes and ponds must be retained substantially in their natural condition. Withdrawals of water that would adversely affect necessary stream base flows or the natural conditions of lakes and ponds can only be permitted in those situations where it is clear that overriding considerations of the public interest will be served.

Interrelationship of Surface and Ground Waters. In the administration of water allocation and water use programs, full recognition must be given to the natural interrelationships between surface and ground water.

Water Quality and Antidegradation Policy. Waters of the state must be of high quality. All wastes and other materials proposed for entry into waters of the state must be provided with all known, available, and reasonable methods of treatment (referred to as AKART) prior to entry. Wastes and other materials and substances are not allowed to enter waters of the state if they will reduce the existing quality of such waters except in those situations where it is clear that overriding considerations of the public interest will be served.

Potable Water Supplies. To satisfy human domestic water needs, adequate and safe supplies of water must be preserved and protected in a potable condition.

Storage. Multiple-purpose impoundment structures are preferred over single-purpose structures. The development of multipurpose water storage facilities is to be a high priority of state programs for water allocation, planning, management, and efficiency. The Department of Ecology, other state agencies, and local governments are directed to evaluate the potential for the development of new storage projects and the benefits and effects of storage in reducing damage to stream banks and property; increasing use of land; providing water for municipal, industrial, agricultural, power generation, and other beneficial uses; and improving stream flow regimes for fisheries, and other instream uses. In planning and construction of storage facilities, proper consideration must be given to methods for protection of fish resources.

Conservation. Federal, state, and local governments, individuals, corporations, groups, and other entities are encouraged to implement water conservation practices. Improved water use efficiency and conservation must be emphasized in the management of the state's water resources and in some cases will be considered a potential new source of water to meet future needs throughout the state.

Public Water Systems. Development of public water systems on a regional basis is encouraged. The act discourages the development of new public water systems in areas where service is available from an existing public water system.

Water Management Programs. Water management programs, such as watershed plans, are deemed under the act to be in the public interest.

Expressions of Public Interest. During all stages of water planning and allocation processes, expressions of public interest will be sought (RCW 90.54.020).

Chapter 90.54 RCW directs Ecology to develop and implement, through adoption of rules, a comprehensive state water resources program in accordance with the water resource policies set forth by the act for purposes of providing a process for making decisions on future water resource allocation and use. Ecology is authorized to develop the program incrementally, with each increment addressing a specific geographic segment of the state. Developing the program in this manner allows immediate attention to be given to regions of the state experiencing critical water allocation and use problems. Chapter 90.54 RCW further stipulates that Ecology must modify its rules or adopt new rules to ensure that existing regulatory programs are consistent with the water resource policies of the act as well as with the aforementioned comprehensive state water resources program (RCW 90.54.040).

The act also provides recommendations concerning the manner in which state and local governments as well as other entities should implement **conservation** and **water use efficiency measures** as follows:

- Conservation and water use efficiency programs should utilize an appropriate mix of economic incentives, cost-share programs, regulatory programs, and public information efforts. Programs that encourage voluntary participation and compliance are preferred under the act.

- Increased water use efficiency should receive consideration as a potential source of water in state and local water resource planning processes.

- Consideration should be given to the benefits of conservation and water reclamation in considering the cost effectiveness of alternative water sources (RCW 90.54.180).

The act requires that public water systems receiving state financial assistance for acquisition and construction of new sources of water or expansion of existing water sources to develop and implement, if cost effective, a water use efficiency and conservation element of their water system plans prepared pursuant to Chapter 43.20 RCW (RCW 90.54.180).

3.1.2 Water Code (Chapter 90.03 RCW)

The Water Code (Chapter 90.03 RCW) establishes the authority of the state to regulate and control beneficial use of the waters of the state of Washington (RCW 90.03.010). The act establishes the doctrine of prior appropriation as the primary basis for allocation of surface waters of the state. Under that doctrine, ownership of water is vested in the state as a common property of the public. Right to put water to a beneficial use is granted to appropriators by the state in the form of a water right. An appropriator that is first in time to put a specific source or increment of water to a beneficial use has a priority right to its use. Subsequent appropriations are generally not allowed if they are injurious to priority water right holders (90.03.010).

The act enumerates the following basic state water policies:

> . . . it is a policy of the state to promote the use of public waters in a fashion which provides for obtaining maximum net benefits arising from both diversionary [out-of-stream] uses of the state's public waters and the retention of waters within streams and lakes in sufficient quantity and quality to protect instream and natural values and rights. . . Further based on the tenet of water law which precludes wasteful practices in the exercise of rights to use water, the department of ecology shall reduce these practices to the maximum extent practicable, taking into account sound principals of water management, the benefits and costs of improved water use efficiency, and the most effective use of public and private funds, and when appropriate, work to that end in concert with agencies of the United States and other public and private entities (RCW 90.03.005).

The act establishes procedures for appropriation of surface water including making appropriation permit applications and issuance of **appropriation permits**, **water right certificates**, and **water rights changes** by Ecology (RCW 90.03.250-390). These procedures are discussed in greater detail in Section 3.1.6 below. In granting water rights, the act requires that Ecology insure that four basic tests are met: 1) the water will be put to beneficial use(s), 2) water is available for appropriation, 3) the appropriation will not be injurious to existing water rights, and 4) the appropriation will not be detrimental to the public interest.

The act also establishes the process for adjudicating all existing water rights, including rights and claims established by custom or other doctrines (for example, riparian rights, federal reserve rights, etc.) prior to the enactment of Chapter 90.03 RCW (RCW 90.03.105-245). A **general adjudication** is a legal process conducted through the State Superior Court that determines the validity and scope (amount, place of use, period of use, etc.) of water rights in a given area. RCW 90.03.105 allows planning units formed pursuant to Chapter 90.82 RCW to petition Ecology to conduct a general adjudication for a Water Resource Inventory Area (WRIA) or for a portion of a WRIA. Ecology is required to give high priority to such a request.

Under RCW 90.03.060, Ecology is authorized to appoint a **water master** whenever it finds it to be in the interest of the state or water users to require them. The water master, acting under the direction of Ecology, divides, regulates, and controls the use of water within a designated water master district as necessary to prevent the use of water in excess of the amount of water to which each water right holder is entitled. The water master is responsible for enforcing applicable state water laws (RCW 90.03.070) and has the power to arrest, within their jurisdictional district, any person in the act of violating the Water Code (RCW 90.03.070). If requested by a watershed plan adopted pursuant to Chapter 90.82 RCW, Ecology may appoint a water master for a Water Resource Inventory Area (WRIA) or for a portion of a WRIA, subject to availability of state or non-state funding (RCW 90.03.060).

The Water Code requires that the owner or owners of any surface water diversion must maintain, to the satisfaction of Ecology, controlling works and a measuring device to allow accurate regulation and measurement of diverted water (RCW 90.03.360). For surface water bodies in which the status of a salmon stock is classified as a **depressed stock**, as determined by the Washington State Department of Fish and Wildlife, Ecology is directed to require the owner or owners of any surface water diversions to **meter or measure diversions** using a method or methods approved by Ecology. A depressed stock is defined as:

> . . .a stock of fish whose production is below expected levels based on available habitat and natural variations in survival rates, but above the level where permanent damage to the stock is likely (WDF and WDW 1992).

Similarly, where the volume of water being diverted exceeds one cubic foot per second, owner or owners of surface water diversions are required to meter or measure diversions using a method or methods approved by Ecology.

The Water Code sets forth requirements for **storage reservoir permits** and for **secondary permits**; the latter being permits for beneficial use of the water stored in reservoirs (RCW 90.03.370). Reservoir permits and secondary permits are processed in accordance with the appropriation permit and water right certification requirements enumerated in RCW 90.03.250-320. Under RCW 90.03.370, Ecology is required to expedite processing of applications for the following types of reservoir projects:

- Development of storage facilities that do not require a new water right for diversion (surface water) or withdrawal (ground water) of the water to be stored;
- Adding or changing one or more purposes of use of stored water;
- Adding to the capacity of an existing storage facility; and
- Applications for secondary permits to secure use of water from existing storage facilities.

The Water Code considers underground geologic formations used for **underground artificial storage and recovery** projects to be "reservoirs," and provides for permitting of such projects under the reservoir permit provisions of the code (RCW 90.03.360). Ecology is directed to develop rules establishing standards for review and standards for mitigation of adverse impacts underground artificial storage and recovery projects addressing the following issues:

- Aquifer vulnerability and hydraulic continuity;
- Potential impairment of existing water rights;
- Geotechnical impacts and aquifer boundaries and characteristics;
- Chemical compatibility of surface water and ground water;

- Recharge and recovery treatment requirements;
- System operation;
- Water rights and ownership of water stored for recovery; and
- Environmental impacts.

To qualify for a reservoir permit, proposed underground artificial storage and recovery projects must be consistent with the standards for review and standards for mitigation.

The Water Code also sets forth provisions for public water systems **interties** that permit the exchange or delivery of water between public water systems to increase water system reliability and/or to achieve public health and resource management objectives (RCW 90.03.383). The exchange or delivery of water enabled by an intertie must be within the limitations of the withdrawal or diversion rates established under the participating public water systems' existing water right permits or certificates, or contained in claims (See Chapter 90.14 RCW below).

3.1.3 Regulation of Public Ground Waters (Chapter 90.44 RCW)

Regulation of Public Ground Waters (Chapter 90.44 RCW) was established by the state legislature as a supplement to the Water Code (Chapter 90.03 RCW) intended to extend the application of surface water statutes to the appropriation and beneficial use of ground water (RCW 90.44.020). The chapter defines ground water as:

> . . . all waters that exist beneath the land surface or beneath the bed of any stream, lake, or reservoir, or other body of surface water within the boundaries of this state, whatever may be the geological formation of structure in which such water stands or flows, percolates or otherwise moves (RCW 90.44.035).

Two types of ground water are recognized: 1) underground storage owing wholly to natural processes, and 2) artificially stored ground water, which includes water that has been intentionally stored (e.g., artificial storage and recovery projects) and incidentally stored (recharge from irrigation facilities).

The chapter declares ground water to be waters of the state and stipulates that the **appropriation and beneficial use of ground water** is subject to a system of permitting and certification similar to that described under the Water Code (RCW 90.44.040-060, RCW 90.44.070-080). However, the chapter provides an **exemption** to the permitting requirements for small withdrawals of ground water for:

> . . . stock-watering purposes, or for the watering of a lawn or of a noncommercial garden not exceeding one-half acre in area, or for single or group domestic uses in an amount not exceeding five thousand gallons per day, or for an industrial purpose in an amount not exceeding five thousand gallons per day . . . (RCW 90.44.050).

Water appropriated under this exemption is entitled to a right equal to that established by permit (for example, a priority date) provided it is regularly used beneficially (RCW 90.44.050).

The permitting requirements do not apply to use of reclaimed water by the owner of a wastewater treatment facility nor to the use of agricultural process water (RCW 90.44.062).

Chapter 90.44 RCW contains provisions for Ecology to establish by rule, standards, criteria, and a process for the designation of **Ground Water Management Areas** and for the preparation of **Ground Water Management Programs** (RCW 90.44.400-440). Such programs are developed through a collaborative effort involving state and local government and stakeholder groups.

3.1.4 Water Rights – Registration – Waiver and Relinquishment (Chapter 90.14 RCW) (also referred to as the Water Rights Claims Registration Act)

In recognition that records concerning water rights that were established prior to adoption of the Water Code (Chapter 90.03 RCW) in 1917 and Regulation of Public Ground Waters (Chapter 90.44 RCW) in 1945 were incomplete, the state legislature enacted the Water Rights Claims Registration Act in 1967 to provide for a more comprehensive understanding of the amount of water that has been allocated. The act authorized Ecology (then Water Resources Department) to accept and register **water right claims** (RCW 90.14.041). A water right claim is a claim to water use that began prior to adoption of Chapter 90.03 RCW and Chapter 90.44 RCW where there is not a clear record of a water right permit or certificate. A claim does not establish a water right; the validity of a claim must be determined through a general adjudication. The first claims filing period ended in 1974. Subsequently, the claims registry has been re-opened and closed on a number of occasions. The most recent claims filing period extended from September 1, 1997 to June 30, 1998 (RCW 90.14.068).

This act also provides a process for **relinquishment** of a right or a portion of a right that has been abandoned or not beneficially used for a period of five years. The relinquished right or portion of a right reverts back to the state of Washington (RCW 90.14.160-180). The act stipulates circumstances under which non-use of water rights will not result in relinquishment, such as drought or service in the U.S. armed forces during a military crisis. Additionally, the act exempts a number of types of water rights from relinquishment, such as water claimed for municipal supply purposes (RCW 90.14.140).

3.1.5 Water Conservancy Boards (Chapter 90.80 RCW)

The 1997 state legislature authorized creation of local conservancy boards to enable processing of water right transfers and changes at the local level. Counties may establish, through resolution and approval by Ecology, conservancy boards as independent units of local government (RCW 90.80.020-030). A conservancy board can be established by a single county, in cases where all lands within in a Water Resource Inventory Area or Areas are within the jurisdictional boundaries of that county, or by multiple counties where a WRIA encompasses land under jurisdiction of more than one county (RCW 90.80.035). All conservancy board decisions are ultimately reviewed and affirmed, reversed, or modified by Ecology (RCW 90.80.080).

3.1.6 How Chapter 90.54 RCW, Chapter 90.03 RCW, Chapter 90.44 RCW, Chapter 90.14 RCW, and Chapter 90.80 RCW function together in Water Right Permitting and Relinquishment

This section summarizes processes employed by Ecology for permitting of new water rights, relinquishment of water rights, and permitting changes to existing water rights.

3.1.6.1 Permitting New Water Rights.

To receive a new water right, a person must first file an application to appropriate waters of the state. Ecology provides notice of the proposed project and evaluates the proposal to determine if: 1) there is water to appropriate in the quantities requested; 2) the uses proposed are beneficial; and 3) the proposed project would not impair existing water rights nor be detrimental to the public welfare. Documentation of such an evaluation is provided in a **Report of Examination**. Based on the Report of Examination, Ecology will either issue a permit authorizing the appropriation of waters of the state, or deny the application. The applicant is not authorized to divert or withdraw water until Ecology issues a permit and then only in accordance with the conditions in the permit.

Permits are issued with a development schedule to allow facilities to withdraw ground water (well and pump) or divert surface water (diversion works) to be constructed to enable the water to be put to beneficial use. Extensions to this development schedule may only be granted by Ecology for good cause (RCW 90.03.320). During development of the project, the intent of the original project (for example, the purpose of use) cannot be changed. Once the facilities have been constructed and the water has been put to beneficial use, the water right is said to have been **perfected**. Ecology then issues a water right certificate for the purpose of use, place of use, point of diversion or withdrawal, period of use, and quantity of water that has been put to beneficial use (see Section 3.1.1 for a discussion of beneficial use).

In evaluating an application to appropriate waters of the state, Ecology must conclude that water is available for appropriation. Water availability has both physical and legal meaning. Technically, there must be water physically available from the source to meet the uses or needs proposed for the requested quantity of water. Legally, there is water available only if it can be appropriated without impairing existing water rights, either by reducing the quantity available to satisfy those rights or by reducing the quality of the water available. For purposes of the impairment analysis, existing rights include rights to withdraw or divert water, applications for new water rights filed before the application under evaluation (in cases of priority processing in accordance with administrative rule, Chapter 173-152 WAC), and instream flows set by administrative rule. A proposed direct diversion out of a surface water source will clearly affect that source. Withdrawal of ground water from a source that is interconnected with (in **hydraulic continuity** with) a surface water body will similarly affect surface water flows. However, the location and timing of the effect may be considerably different than with a direct diversion.

Evaluations of availability and impairment must recognize this interrelationship between ground water and surface water.

Finally, Ecology cannot issue a permit if the use of water will be detrimental to the public welfare (RCW 90.03.290). The policies in the Water Resources Act of 1971 (Chapter 90.54 RCW) require:

> . . . allocation of water in a manner that preserves instream resources, protects the quality of the water, provides adequate and safe supplies of water and promotes regional water supply systems that serve the public generally (Pharris and McDonald 2000).

These factors and relevant case law serve as guidance for Ecology in evaluating whether granting an application for a new water right would be detrimental to the public welfare.

Generally, applications for new water rights are processed in the order they are received by Ecology. However, a new application may be processed prior to completing other applications from the same source of water if it:

> . . . 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).

Similarly, an application may be processed prior to competing applications if there is a public health or safety emergency or the proposed use is nonconsumptive and would:

> . . .substantially enhance or protect the quality of the natural environment (WAC 173-152-050).

3.1.6.2 Relinquishment of Water Rights

Once a water right is perfected, it must continue to be used or is subject to loss through abandonment or relinquishment. Abandonment requires nonuse for an extended period of time and intent to abandon the right. Relinquishment occurs when all or a portion of a water right is not used for five consecutive years, unless there is a sufficient cause for the nonuse (RCW 90.14.180). The legislature has defined **"sufficient cause"** to include, but not be limited to, the following circumstances:

- Drought or other unavailability of water;
- Active service in the armed forces of the United States during military crisis;
- Operation of legal proceedings that prevent the use of water; and
- Federal or state leases/options to buy land or water rights that preclude or reduce the use of the right by the owner of the water right (RCW 90.14.140).

The legislature recently added several sufficient causes that specifically apply to irrigation rights:

- Temporary reductions due to varying weather conditions that warrant a reduction in water use;
- Temporary reductions in diversions or withdrawals associated with electrical buy-back programs;
- Reliance on transitory presence of return flow in lieu of diversion or withdrawal of water from the primary source when the return flows are measured or reliably estimated; and
- Reductions in water use due to crop rotation (RCW 90.14.140).

The legislature also applied the sufficient cause provisions to water saved as part of conservation measures implemented under the Yakima River Basin Enhancement Project, provided it is reallocated according to the federal law that established the enhancement project.

In addition to the "sufficient causes" for not using water, Chapter 90.14 RCW exempts the following water rights from relinquishment:

- Water rights claimed for power development;
- Water rights used for standby or reserve water supply to be used in times of drought or other low flow period so long as withdrawal or diversion facilities are maintained in good operating condition;
- Water claimed for a determined future development where there is a fixed and determined development plan prepared within the first five years after nonuse and action is taken to develop the source within fifteen years of the last use;
- Municipal water rights;
- Water rights leased to another party that makes beneficial use of the water and the change is approved by Ecology;
- Water rights or portions of a right satisfied by the use of reclaimed agricultural industrial process water; and
- Trust water rights (RCW 90.14.140).

In order for a water right to be relinquished, Ecology must issue an order notifying the water right holder of Ecology's finding of relinquishment (RCW 90.14.130), or a court in the course of an adjudication must enter an order confirming that a right has been relinquished (RCW 90.03.110-245).

3.1.6.3 Water Right Changes

Historically, a water right **change** referred to a change in certain characteristics of a water right, for example, point of diversion, place of use, or purpose of use; while a water right **transfer** referred to a transfer of ownership of a water right from one person to another. For purposes of this discussion, the term "change" will encompass both changes and transfers. RCW 90.03.380 and RCW 90.44.100 provide that any existing surface water or ground water right that has been applied to a beneficial use(s) is eligible for a change in the point of diversion or withdrawal, place of use, or purpose of use, provided the change will not result in impairment to existing water rights.

All changes require approval by Ecology, except in cases of direct property transfer where the water right is appurtenant to the land and none of the water right characteristics are modified (RCW 90.03.380). In making a decision on a change application, Ecology must make a tentative determination of the validity and extent of the water right, whether all or part of the right has been lost due to nonuse, and whether the change would impair any other right (RCW 90.03.380 or 90.44.100). Until a very recent decision of the Washington State Supreme Court, Ecology also examined whether the change would be in the public interest. However, the Court in *Public Utility District No.1 of Pend Oreille County v. Ecology,* Slip Opinion 70372-8, (July 18, 2002), held that when acting on surface water change applications, Ecology may not deny the application based upon public interest considerations.

In tentatively determining the extent and validity of an existing right, Ecology focuses primarily on how much water has been beneficially used, specifically, what was perfected and what may have been abandoned or otherwise relinquished due to nonuse. If the requested change would increase the amount of water used, the right would be unlawfully enlarged and/or may cause impairment to existing rights.

A ground water right that is in the permit stage (not perfected) can be changed with respect to the point of withdrawal or the place of use, but the purpose of use may not be changed. Additionally when a change in a ground water right involves modification of the point of withdrawal, the new point of withdrawal must be within the same body of ground water as the point of withdrawal for the original water right.

In making its decision on a change application, Ecology must determine whether the change would impair existing water rights, including existing rights that are senior or junior to the right that is the subject of the change application. Pending applications for a new water right are <u>not</u> entitled to protection when Ecology makes a decision on a change application.

An existing right is impaired if the proposed water right change would prevent the holder of an existing water right from accomplishing a beneficial use in accordance with the provision of his or her water right. A common form of impairment or potential impairment is interference among two or more wells pumping from the same aquifer. In order for a senior ground water right holder to be protected from well interference from a junior water right holder, the senior water right holder's well would need to meet qualifying withdrawal facility standards contained within Chapter 173-150 WAC.

There have been recent legislative and administrative changes that allow Ecology to process change applications more promptly than was previously possible. Change applications may now be processed independently of applications for new water rights from the same source. Change applications may also be processed ahead of other previously filed change applications if there is insufficient information on which to base a decision on the previous applications and notice is given to the affected previous applicants (RCW 90.03.380). Change applications may also be processed under a cost reimbursement agreement pursuant to RCW 90.03.380.

A change application may be processed prior to completion of the application under the following circumstances:

- If the change is being sought for public health or safety reasons; or

- If the change would substantially enhance the quality of the natural environment, would provide public water supplies to meet the general needs of the public for regional areas; or the applicant is a party to an adjudication (WAC 173-152-050).

The legislature has also attempted to speed up the process of decisions on change requests by authorizing creation of county Water Conservancy Boards under Chapter 90.80 RCW to make an initial decision on such applications (see Section 3.1.5). Water Conservancy Boards apply the same standards or tests as Ecology, and sends its record of decision to Ecology. Ecology may affirm, reverse, or modify the action of a board within 45 days (which may be extended by 30 days) of receipt of the record of decision. If Ecology does not act within the prescribed time period, the decision of the board becomes Ecology's decision.

3.1.7 2003 Legislation

In addition to the modifications to Chapter 90.82 RCW described in Section 1.5, the 2003 Legislature enacted several pieces of legislation affecting water quantity laws, regulations, and programs. At time this document went to print, formal guidance had not yet been developed by Ecology concerning the impacts of the new legislation. However, preliminary analysis has been developed by the department and is presented in summary form below (Ecology 2003; 2003a). The Governor signed the legislation listed below; however, as noted below, two bills were partially vetoed.

Second Engrossed Substitute House Bill 1338 – An Act Related to Municipal Water Rights

- Clarifies the definition of municipal water supply to include (1) water supplied to fifteen or more residential connections, (2) water used for governmental purposes (by counties, cities, towns, public utility districts, and water and sewer districts), and (3) other beneficial uses generally associated with water use within a municipality (for example, fire flow, park irrigation, industrial/commercial, system maintenance, etc.). *(NOTE: Under current law, water rights for municipal supply purposes do not "relinquish" due to lack of us.)*

- Authorizes the use of a municipal water right for environmental purposes (for example, fish and wildlife, water quality, habitat values, etc.) and to implement watershed plans, habitat conservation plans, and FERC licenses.

- Clarifies that existing municipal rights may be used to serve additional people and homes, where approved by the Department of Health.

- Clarifies that the place of use of municipal water rights includes the municipal supplier's service area, as authorized by the Department of Health. Any change in a place of use must not be inconsistent with land use or watershed plans. Establishes a duty to serve within the authorized retail service area.

- Clarifies the legal status of existing municipal water right certificates issued for future growth by declaring them to be in good standing.

- Mandates water conservation for all municipal suppliers. Requires the Department of Health to adopt comprehensive rules by December 2005. To fund the development and implementation of the conservation program, the bill allows Health to collect additional operating permit fees equivalent to 25 cents per residential service connection per year through June 2007.

- Prioritizes existing instream flow funding to areas where the exercise of inchoate (authorized but not used) rights may greatly affect stream flows.

- Clarifies requirements for consideration of water reuse when preparing water supply and wastewater treatment plans.

- Allows inchoate surface water rights to be moved outside of the authorized service area if instream flows are addressed, or in cases of public health emergencies.

- Authorizes a pilot watershed agreement to allow water right holders to gain additional flexibility and certainty in exchange for contributing to watershed objectives.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=1338

Engrossed Substitute Senate Bill 5028 – An Act Related to Water Pollution and Water Rights

- Preserves Ecology's authority to condition water quality certifications for power dams by explicitly recognizing the relevant Elkhorn and Sullivan court decisions, and by declaring that the act does not affect the department's existing authority for federally-licensed hydropower projects. (Also affirms the department's authority under the mitigation act (90.74 RCW).)

- Acknowledges the department's authority to issue permits and regulatory orders to meet water quality standards.

- Authorizes the department to use incentive-based methods to solve water quality problems, including conservation, acquisition of water rights, and habitat restoration.

- Prohibits the department from using the Water Pollution Control Act to condition the full exercise of a state water right.

- Allows the department to address the waste of water through administrative compliance actions.

- Increases the penalties for violating water rights law from a maximum of $100 per day (set in 1917) to a range of $100 to $5,000 per day, based on the seriousness of the violation.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=5028

Substitute Senate Bill 1113 – An Act Related to Irrigation District Boards of Joint Control

- Allows water right holders who provide irrigation water to join with irrigation districts as boards of joint control.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=1113

Engrossed Substitute House Bill 1640 – An Act Related Water Banking within the Trust Water Program

- Authorizes the department to use the trust water rights program in the Yakima River basin for water banking purposes.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=1640

Engrossed House Bill 2067 – An Act Relating to Withdrawals of Public Ground Water for Clustered Residential Developments

- On a pilot project basis, alters the ground water permit exemption for domestic use of water in clustered residential developments in Whitman County.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=2067

Engrossed Senate Bill 5014 – An Act Related to Public Water Projects

- Creates a subaccount at the Public Works Board to receive funds for water storage projects and water systems facilities. (This bill was partially vetoed.)

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=5014

Engrossed Senate Bill 5073 – An Act Related to Watershed Management (Note that the scope of this legislation extends beyond simply water quantity laws, regulations, and programs)

- Allows a city, county or special purpose district to expend up to ten percent of its water-related revenues in the implementation of watershed management plan projects or activities. Revenues may be expended on watershed management plans addressing water supply, water transmission, water quality treatment or protection, or any other water related purpose. Watershed management plans include watershed plans developed under Chapter 90.82 RCW, salmon recovery plans under Chapter 77.85, and watershed management elements of comprehensive plans and shoreline master programs. (This bill was partially vetoed.)

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=5073

Substitute Senate Bill 5575 – An Act Related to Small Irrigation Impoundments.

- Declares that certain small irrigation impoundments do not require a reservoir or secondary use permit.

The full text of the bill can be viewed at:
www.leg.wa.gov/wsladm/billinfo/dspBillSummary.cfm?billnumber=5575

3.1.8 Other Selected Water Resources Related Laws, Regulations, and Programs

In addition to those enumerated above, there are a number of other laws, regulations, and programs related to water quantity and that may have relevance to watershed planning under Chapter 90.82 RCW. A select number of those laws, regulations, and programs are summarized below in Table 3-1.

TABLE 3-1
Selected Water Resources Related Laws, Regulations, and Programs

Law, Regulation, Program	*Provisions/Effect*
Federal Laws, Regulations, and Programs Related to Water Rights	
Federal and Indian Reserved Water Rights (These rights are commonly referred to as *Winters* rights based on a 1908 federal court decision *Winters v. United States*.)	When the United States reserves land for some federal purpose, such as national parks, national forests, military reservations, and Indian reservations, the federal government reserves amounts of water necessary to meet the primary purpose of the reservation. For purposes of appropriation, the priority date of a federal reserved water right is usually the date the reservation was created. Since the laws and treaties of the United States preempt state law, a state cannot limit federal exercise of the reserved right (Pharris et al. 2002).
U.S. Department of Interior, Bureau of Reclamation Projects under the Reclamation Act of 1902.	The Bureau of Reclamation operates about 180 water projects in 17 western states including the Columbia Basin, Yakima, and Okanogan projects in Washington State (Reclamation 2002). The largest project in Washington is the Columbia Basin Project, which diverts water from Grand Coulee Dam to basin farms. Under the state law "Water Rights of the United Sates" (Chapter 90.40 RCW), the state of Washington granted the federal government authority store and divert water for irrigation projects and the right of eminent domain for purposes of constructing, operating, and maintaining such projects.
Additional State Laws, Regulations, and Programs Related to Water Rights	
Construction Projects in State Water (Chapter 77.55 RCW)	RCW 77.55.050 requires Ecology to notify the Department of Fish and Wildlife of each application for a permit to divert or store surface water. Under the act, the Department of Fish and Wildlife is given 30 days to raise objections to an application, and Ecology is granted authority to deny an application if issuance of a permit might result in lowering the flow of water in a stream below the flow necessary to adequately support fish population in that stream. Chapter 77.55 RCW is discussed in more detail in Sections 3.2.3 and 3.4.9.1.
Water Resource Management (Chapter 90.42 RCW)	This act establishes the state's **Trust Water Rights** program. Trust water rights may be held by Ecology or authorized for use for instream flow, irrigation, municipal, or other beneficial uses. The state may acquire all or portions of existing rights by gift, purchase, or other means, except condemnation. Rights may be acquired on a temporary or permanent basis.
Washington Water Acquisition Program	The Washington Water Acquisition Program voluntary program involving using a combination of federal and state funds intended to obtain water from current out-of-stream users to increase stream flows in 16 watersheds with vulnerable salmon and trout populations. The program allows water right holders to sell, lease, or donate part or all of their rights to the state for placement in the **Trust Water Rights** program. Sellers and lessors receive fair market value for their water. Donations may be temporary or permanent.

Law, Regulation, Program	*Provisions/Effect*
Water Rights (Chapter 173-152 WAC)	Chapter 173-152 WAC establishes the framework for Ecology administration of the states water rights program established under Chapter 90.54 RCW, Chapter 90.03 RCW, and Chapter 90.44 RCW (see Section 3.1.1, 3.1.2, and 3.1.3 above).
Requirements for Measuring and Reporting Water Use (Chapter 173-173 WAC)	Chapter 173-173 WAC contains rules that implement Ecology's requirements for water users to measure withdrawals and diversions of water. Measurements of water are required for all new surface water rights, existing surface water rights for surface waters containing depressed or critical salmon stock, new and existing water rights for ground water that may affect surface waters containing depressed or critical salmon stock, and existing water rights for diversions exceeding one cubic foot per second.
State Laws, Regulations, and Programs Related to Irrigation Districts	
Irrigation Districts Generally (Chapter 87.03 RCW)	Chapter 87.03 RCW authorizes a jurisdictional county legislative authority to establish an irrigation district with defined geographic boundaries. Within such boundaries, an irrigation district is authorized to own and operate: 1) a system for supplying irrigation water to owners of irrigated lands, 2) electrical facilities to operate pumps and other equipment and for sale to inhabitants of the district, 3) a sanitary sewers system, 4) a public water system, 5) a system of water mains and hydrants for fighting fires, and 6) a system of street lights for roads and highways.
Joint Control of Irrigation Districts (Chapter 87.80 RCW)	Chapter 87.80 RCW authorizes a jurisdictional county legislative authority to appoint a joint board of control comprised of irrigation districts or operating entities for divisions within a federal reclamation project that share water from the same source. The purpose of a joint board of control is to provide for efficient administration of reservoirs, canals, interties and other irrigation facilities shared by multiple districts or entities.
Referendum 38 Funding	Referendum 38, approved by voters in 1980, authorized the state of Washington to issue $125 million in bonds to fund public irrigation district and public water system improvements. Ecology is responsible for administering $50 million in funding for pubic irrigation districts, while the Department of Health administers $75 million for public water systems.
Irrigation Efficiencies Grant Program	Under this program, the Washington State Conservation Commission awards grants to conservation districts on a competitive basis. The grant program is limited to 16 WRIAs including 1, 7, 8, 9, 10, 12, 17, 18, 32, 35, 37, 38, 39, 45, 48, and 49. Conservation districts use the grant monies to provide financial assistance to irrigators for improvements to irrigation water delivery systems, irrigation system efficiencies, and irrigation water management. Highest priority is placed on funding on-farm activities. Irrigators receiving funding under this program must put a portion of water saved through irrigation improvements into the **Trust Water Rights** program.

Law, Regulation, Program	*Provisions/Effect*
Other State Laws, Regulations, and Programs	
Reclaimed Water Use (Chapter 90.46 RCW)	This act encourages and facilitates use of reclaimed water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife habitat creation and enhancement purposes. Reclaimed water means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated to render it suitable for a beneficial use. Under the act, reclaimed water is intended to be used to preserve potable water for drinking water and such use constitutes the development of new basic water supplies needed to meet future needs. The Department of Health (DOH) in conjunction with Ecology is directed to develop standards, procedures, and guidelines. DOH is authorized to issue permits for the use of reclaimed water to a municipal or quasi-municipal entity or to a holder of a waste discharge permit issued under the state's Water Pollution Control Act (Chapter 90.48 RCW).
Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC)	These regulations were adopted under authority of the Water Well Construction Act, Chapter 18.104 RCW, and establish the minimum standards for the construction and decommissioning water wells.
Dam Safety (Chapter 173-175 WAC)	To protect the safety of life and property, this code regulates dams that can impound a volume of ten acre-feet (approximately 3.2 million gallons) or more of water as measured at the dam crest elevation. Permits are required for construction of such dams. Ecology periodically inspects dams during operations.

3.2 INSTREAM FLOW

This section describes a number of the laws and regulations that govern or set policy for establishment of minimum instream flows. A number of these were discussed previously in Section 3.1, Water Quantity, but will be briefly revisited to address specific provisions related to instream flow.

More information regarding establishment of instream flows, including a discussion of methodologies that are appropriate and available for use in setting flows, can be found in *A Guide to Instream Flow Setting in Washington State*, developed by Ecology's Water Resources Program and the Washington Department of Fish and Wildlife (2003). This document is hereby incorporated by reference pursuant to provisions of WAC 197-11-600 and WAC 197-11-635. The guide to instream flow can be obtained from the Department of Ecology's website at www.ecy.wa.gov/biblio/0311007.html.

3.2.1 Water Resources Act of 1971 (Chapter 90.54 RCW)

As discussed in Section 3.1.1 above, the Water Resources Act of 1971 (Chapter 90.54 RCW) establishes the fundamentals of state water resource policy to ensure that waters of the state are protected and fully utilized for the greatest benefit of the people of the state and to guide state agencies and local governments in carrying out water and water-related resource programs (RCW 90.54.010). Among the fundamentals enumerated under the act is the following statement of policy pertaining to **instream resources**:

> . . . 3) The quality of the natural environment shall be protected and, where possible, enhanced as follows:
>
> (a) Perennial rivers and streams of the state must be retained with base flows necessary to provide for **preservation of wildlife, fish, scenic, aesthetic, and other environmental values, and navigational values**. Lakes and ponds shall be retained substantially in their natural condition. Withdrawals of water which would conflict therewith shall be authorized only in those situations where it is clear that overriding considerations of public interest will be served . . . (RCW 90.54.020).

3.2.2 Water Code (Chapter 90.03 RCW)

As discussed in Section 3.1.2 above, the Water Code (Chapter 90.03 RCW), establishes the authority of the state of Washington to regulate and control waters of the state. The Water Code grants exclusive authority to Ecology for establishing minimum stream flows or levels or lake level restrictions. During all stages of the development of minimum flows or levels on streams or lakes, Ecology is required to consult with and consider the recommendations of the Washington Department of Fish and Wildlife; the Department of Community, Trade, and Economic Development; the Department of Agriculture; and affected Indian tribes. The aforementioned agencies are authorized to present their views on minimum flow needs for specific water bodies at public hearings and during proceedings of the Federal Energy Regulatory Commission. In addition, the water code stipulates that any permits issued by Ecology for appropriation of water from a stream for which minimum flows or levels have been adopted must be conditioned to protect the minimum flows and levels (RCW 90.03.247).

Chapter 90.03 RCW also stipulates that setting minimum flows or levels by rule for a water body constitutes an **appropriation of water**. The **priority date** for such an appropriation would be the effective date of the rule (RCW 90.03.345), unless otherwise specified in statute (see Section 3.25 below).

3.2.3 Construction Projects in State Waters (Chapter 77.55 RCW)

Chapter 77.55 RCW establishes a portion of the state's policy framework relating to minimum flows. The act states that:

> It is the policy of this state that a flow of water **sufficient to support game fish and food fish populations** be maintained at all times in the streams of this state . . . (RCW 77.55.050).

However, Chapter 77.55 RCW stipulates that the aforementioned policy does not affect existing water rights (RCW 77.55.050).

The provisions of Chapter 77.55 RCW are discussed in greater detail in Section 3.1.7 above and Section 3.4.9.1 below.

3.2.4 Minimum Water Flows and Levels (Chapter 90.22 RCW)

Chapter 90.22 RCW authorizes Ecology to:

> . . . establish minimum water flows or levels for streams, lakes, or other public waters [waters of the state] for purposes of **protecting fish, game, birds, or other wildlife resources, or recreational or aesthetic values** of said public waters whenever it appears to be in the public interest to establish the same (RCW 90.22.010).

The establishment of minimum flows or levels or modification of existing minimum flows or levels for a stream, lake, or other waters of the state under authority of Chapter 90.22 RCW must be accomplished through the adoption of a rule (see Rule Making Process in Section 1.6). As part of the rule adoption process, Ecology must hold a public hearing in the county in which the affected water body is located. If the affected water body is located in more than one county, Ecology has discretion to hold additional public hearings in multiple locations. Notice of a public hearing or hearings must be given by publication in a newspaper of general circulation in the county or counties in which the affected water body is located. The notice must be published once per week for two consecutive weeks prior to a hearing or hearings. The content of the public notice must include:

- The name of the water body that is under consideration for rule making;
- The time, date, and location of the hearing or hearings; and
- A statement that all persons, including private citizens and public officials, may present their views either orally or in writing.

Ecology must provide the Department of Fish and Wildlife, Washington State Department of Health, Washington State Department of Natural Resources, and Washington State Department of Transportation with direct notification of a hearing or hearings (RCW 90.22.020).

Chapter 90.22 RCW provides a mechanism for the Department of Fish and Wildlife to request Ecology to establish minimum flows or levels for a water body when necessary to protect fish, game, or other wildlife resources. Any such request must be accompanied by a statement justifying the need for establishing the minimum flows or levels. Ecology is also authorized to establish minimum flows or levels when necessary to **preserve water quality**. In taking such an action, Ecology must prepare a statement of justification and include the statement with the proposed rule when filing it with the Code Reviser (RCW 90.22.010).

Under Chapter 90.22 RCW, the authority of Ecology to establish minimum flows or levels does not extend to water artificially stored in existing reservoirs or to the rights associated with the use of such waters. However, in granting storage permits under Chapter 90.03 RCW (see Section 3.1.2), Ecology is required to give "full recognition" to any minimum flows that have been established for stream reaches below a storage facility. In addition, Ecology is precluded from issuing rights to divert or store waters of the state that would conflict with a rule adopted pursuant to Chapter 90.22 RCW (RCW 90.22.010; RCW 90.22.030).

Chapter 90.22 RCW asserts as a policy of the state that in establishing minimum flows or levels for a stream, lake, or other waters of the state, sufficient flows or levels should be maintained as needed to **satisfy stock watering** requirements for stock on adjacent riparian grazing lands that drink directly from the affected water body. However, this policy does not apply when maintenance of flows or levels for this purpose results in an "unconscionable waste," nor does it apply to feed lots and other similar animal feeding operations (Chapter 90.22.040).

3.2.5 Watershed Planning Act (Chapter 90.82 RCW)

Watershed plans prepared under Chapter 90.82 RCW are required to include a water quantity component and may, at the discretion of the initiating governments, include an optional instream flow, water quality, and/or habitat component. The Watershed Planning Act defines minimum instream flow as:

> . . . a minimum flow under Chapter 90.03 or 90.22 RCW or a base flow under Chapter 90.54 RCW (Chapter 90.82.030).

The act establishes a collaborative process for planning units to develop recommendations for establishing minimum instream flows or modifying existing minimum instream flows and for Ecology to engage in rule making in response to the recommendations. This process is described in more detail in Section 5.3.

The act also identifies provision of water to satisfy minimum instream flows as an objective of the mandatory water quantity component of watershed plans as follows:

> . . . (2) Strategies for increasing water supplies in the management area, which may include, but are not limited to, increasing water supplies through conservation, water reuse, the use of reclaimed water, voluntary water transfers, aquifer recharge and recovery, additional water allocations, or additional water storage and water storage enhancements. The objective of these strategies is to supply water in sufficient quantities to satisfy the minimum instream flows for fish and to provide water for future out-of-stream uses for water . . . and to ensure that adequate water supplies are available for agriculture, energy production, and economic growth under the requirements of the state's Growth Management Act, Chapter 36.70A RCW . . . (RCW 90.82.070).

3.2.6 Water Resources Management Program Established Pursuant to the Water Resources Act of 1971 (Chapter 173-500 WAC)

As noted above in Section 3.1.1, the Water Resources Act of 1971 (Chapter 90.54 RCW) directs Ecology to develop and implement, through adoption of rules, a **comprehensive state water resources program** in accordance with the water resource policies set forth by the act. The purpose of the program is to provide a process for making decisions on future water resource allocation and use (RCW 90.54.040). Chapter 173-500 WAC was adopted by Ecology to serve as the comprehensive state water resources program called for in the act.

Consistent with the provision of Chapter 90.54 RCW that authorizes Ecology to develop the comprehensive state water resources program in segments, Chapter 173-500 divides the state into 62 **Water Resources Inventory Areas (WRIAs)**. As sufficient data are obtained for each WRIA to enable Ecology to formulate a water resources planning and management program for the area, Ecology adopts such a program through a rule establishing policies for beneficial uses of water within the WRIA. Water rights established prior to the effective date of such rules are not affected by the rules; although (base) flow level limitations imposed by Ecology (or its predecessors) as a condition of permits and certificates prior to the effective date of a rule remain in force (WAC 173-500-060).

The state's comprehensive water resources management program and rules adopted to establish planning and management programs for individual WRIAs or groups of WRIAs will, where appropriate, accomplish the following:

- Identify and foster development of water resource projects;
- Declare preferences or priorities of use by categories;
- Identify streams **closed to further appropriation**;
- Establish **base flows** on perennial streams of the state in amounts necessary to **provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental values as well as values associated with navigation**;
- Allocate quantities of water for beneficial uses;
- Reserve water for future beneficial uses;
- **Withdraw waters from appropriation** when sufficient information or data are not available to support sound decision making;
- Establish criteria for limits beyond which further appropriation will not be allowed;
- Designate regions of the state as critical water areas for management purposes; and
- Reflect and implement the fundamentals of the Water Resources Act of 1971 (see Section 3.1.1) (WAC 173-500-020).

WRIA management programs and plans established by rule under 173-500 are implemented through conditions of any water rights issued after adoption of each rule (WAC173-500-060).

Basins for which rules have been adopted are listed in Table 3-2.

3.2.7 Work Plan for Instream Flow Setting

Ecology, in collaboration with the Washington Department of Fish and Wildlife, has developed a *Work Plan for Instream Flow Setting Through 2010* (Ecology 2002a). The plan identifies priorities for Ecology and the Department of Fish and Wildlife for setting flows in rule based generally on work conducted by local watershed planning groups (both Chapter 90.82 RCW and non-Chapter 90.82 RCW planning efforts). The work plan describes goals, strategies, and schedules and, as a working document, will be periodically updated as watershed planning efforts evolve and new information becomes available. The work plan can be viewed on Ecology's website at: http://www.ecy.wa.gov/programs/wr/instream-flows/isflowhome.html.

TABLE 3-2
Water Resources Inventory Areas with Rules

WRIA	*Name of Program*	*WAC Citation*	*Date Filed*
1	Instream Resources Protection Program Nooksack River Basin	Ch. 173-501 WAC	12/04/85
3 and 4	Instream Resources Protection Program – Lower and Upper Skagit Water Resources Inventory Area	Ch. 173-503 WAC	03/14/01
7	Instream Resources Protection Program Snohomish River Basin	Ch. 173-507 WAC	09/06/79
8	Instream Resources Protection Program Cedar-Sammamish Basin	Ch. 173-508 WAC	09/06/79
9	Instream Resources Protection Program Green-Duwamish River Basin	Ch. 173-509 WAC	06/06/80
10	Instream Resources Protection Program Puyallup River Basin	Ch. 173-510WAC	03/21/80
11	Instream Resources Protection Program Nisqually River Basin	Ch. 173-511 WAC	02/02/81
12	Instream Resources Protection Program Chambers-Clover Creek Basin	Ch. 173-512 WAC	12/12/79
13	Instream Resources Protection Program Deschutes River Basin	Ch. 173-513 WAC	06/24/80
14	Instream Resources Protection Program Kennedy-Goldsborough Basin	Ch. 173-514 WAC	01/23/84
15	Instream Resources Protection Program Kitsap	Ch. 173-515 WAC	07/24/81
22 and 23	Water Resources Program Chehalis River Basin	Ch. 173-522 WAC	03/10/76
31 and parts of 32, 33, 36, 37	Water Resources Program for John Day McNary Pools Reach of the Columbia River	Ch. 173-531A WAC	06/24/80
32	Water Resources Program in the Walla Walla River Basin	Ch. 173-532 WAC	12/14/77
45	Instream Resources Protection Program Wenatchee River Basin	Ch. 173-545 WAC	06/03/83
48	Water Resources Program in the Methow River Basin	Ch. 173-548 WAC	12/28/76
49	Water Resources Program in the Okanogan River Basin	Ch. 173-549 WAC	07/14/76

WRIA	*Name of Program*	*WAC Citation*	*Date Filed*
55	Water Resources Program in the Little Spokane River Basin	Ch. 173-555 WAC	01/06/76
59	Water Resources Program in the Colville River Basin	Ch. 173-559 WAC	07/22/77
	Instream Resources Protection Program for the main stem of the Columbia River in Washington State	Ch. 173-563 WAC	06/24/80
	Water Resources Program for the main stem of the Snake River in Washington State (expired 7/01/99)	Ch. 173-564 WAC	01/03/93

Adapted from: *A Guide to Instream Flow Setting in Washington State*, Washington State Department of Ecology and Washington Department of Fish and Wildlife, Ecology Publication No. 03-11-007, March 2003.

3.3 WATER QUALITY

Water quality in Washington State is protected through a combination of federal, state, and local programs. The foundation for water quality law is provided by two federal acts, the Clean Water Act and Safe Drinking Water Act, and the state's Water Pollution Control Act. These and other water quality laws, regulations, and programs are described below.

3.3.1 Federal Laws, Regulations, and Programs

3.3.1.1 Clean Water Act (Federal Water Pollution Control Act)

The federal Clean Water Act is the principal federal law addressing surface water quality. It employs a variety of regulatory and non-regulatory tools to limit direct discharges of pollutants into waterways, finance municipal wastewater treatment facilities, and manage stormwater runoff from streets, construction sites, and farms. These tools are implemented to achieve the overall goal of the act, which is to restore and maintain the chemical, physical, and biological integrity of the navigable waters of the United States so they can support the protection and propagation of shellfish, fish, and wildlife (EPA 2002).

The act makes it illegal for any person to discharge pollutants from a point source into navigable waters without a **National Pollutant Discharge Elimination System (NPDES)** Permit issued in accordance with Section 402 of the Clean Water Act. Such permits usually place limits on the quantity and concentration of pollutants that can be discharged and impose operational conditions that help ensure compliance with those limits. NPDES permits are required for wastewater discharges to surface water from industrial facilities and municipal wastewater treatment plants, stormwater discharges from industrial facilities and construction sites involving disturbance of five acres or more of land (in the process of being modified to one acre), and municipal stormwater systems serving populations of 100,000 or more (in the process of being modified to address some municipal stormwater systems serving populations of less than 100,000).

EPA is responsible for implementation of Section 303 of the Clean Water Act, which includes federal water quality standards and provisions for establishment of **Total Maximum Daily Loads (TMDLs)**. In Washington State, EPA has delegated its Clean Water Act authority to the

Department of Ecology, including issuance of NPDES permits and establishment of TMDLs. TMDLs are discussed in greater detail in Section 3.3.2.7 below.

Section 305(b) of the Clean Water Act requires each state to annually gather data regarding the quality of its navigable waters and conduct an analysis of the extent to which such waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allow for water oriented recreation. This information is provided to the EPA, which compiles the water quality information from all states and delivers a report to Congress regarding the condition of the nation's waters.

Section 401 of the Clean Water Act requires applicants for a federal permit to conduct an activity that would involve deposition of fill or excavation in navigable waters or associated wetlands to obtain a certification from the state in which the project would occur that the project is consistent with federal discharge requirements and the aquatic protection requirement of state law. Such certification is referred to as a **Section 401 Water Quality Certification**. In Washington State, Ecology is responsible for issuing such certifications.

3.3.1.2 Safe Drinking Water Act

The federal Safe Drinking Water Act was established for the purpose of protecting the country's drinking water. The act applies to all sources of water that are or could be potentially used as drinking water, including both surface and ground water. Under authority of the Safe Drinking Water Act, EPA has established comprehensive drinking water quality standards and monitoring requirements for all **public water systems** in the United States. The act also contains provisions for public water systems using ground water sources to delineate **Wellhead Protection Areas** and to develop **Wellhead Protection Programs** for their wells or wellfields. In Washington State, EPA has delegated authority for implementing requirements for public systems to the Washington Department of Health. Washington's public water system program is described below in Section 3.3.3.

The Safe Drinking Water Act provides EPA authority to designate, on its own volition or in response to a petition, **Sole Source Aquifers**. To qualify as a Sole Source Aquifer, it must be demonstrated that 1) an aquifer or aquifer system provides 50 percent or more of an areas drinking water supply and 2) alternative sources of drinking water would not be available to replace that provided by the aquifer if lost due to contamination. However, Sole Source Aquifer designation does not indicate the relative susceptibility of an aquifer to contamination. Designation of a Sole Source Aquifer provides only limited ground water protection. Federal financially assisted projects (projects receiving federal funding in an amount less than 100 percent of project costs) in designated Sole Source Aquifers are reviewed by EPA to ensure that adequate mitigation measures are applied to prevent adverse impacts to ground water.

3.3.2 State Water Quality Laws, Regulations, and Programs

3.3.2.1 Water Pollution Control Act (Chapter 90.48 RCW)

The Water Pollution Control Act is the state's primary legal mechanism for protecting the water quality of waters of the state. The act declares that it is a public policy of the state to:

> . . . maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life [sic], birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require use of all known available and reasonable methods by industries and others to prevent and control pollution of the waters of the state of Washington (RCW 90.48.010).

The Water Pollution Control Act defines **waters of the state** to include:

> . . . lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington (RCW 90.48.020).

Pollution is defined as:

> . . . such contamination, or other alteration of the physical, chemical or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharges of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life (RCW 90.48.020).

The act prohibits discharges of substances to waters of the state that could pollute (adversely affect beneficial use) such water (RCW 90.48.080). It provides Ecology authority to promulgate, amend, or rescind rules and regulations as necessary to implement the provisions of the act, including development of numeric water quality standards and measures for controlling discharges of substances to waters of the state (RCW 90.48.035).

Ecology is designated as the "State Water Pollution Control Agency" for all purposes of the federal Clean Water Act and is authorized to participate in all programs of the Clean Water Act. The authorization includes establishment of a state point source waste discharge permit system to allow Ecology to administer the federal NPDES permit system. Ecology is also authorized to issue Clean Water Act Section 401 Water Quality Certifications (RCW 90.48.260).

The Water Pollution Control Act requires commercial, industrial, or municipal entities that discharge solid or liquid waste, including domestic wastewater, to obtain either an NPDES permit (discharges to navigable waters) or a State Waste Discharge Permit (discharges to land surface, ground water, or municipal wastewater treatment facilities) (RCW 90.48.160-162). The act grants right of entry to Ecology for purposes of inspecting or investigating conditions relating to pollution or potential pollution of waters of the state (RCW 90.48.090). Ecology is granted authority to bring appropriate legal action, with assistance of the Attorney General, necessary to protect the quality of waters of the state (RCW 90.48.037). The Water Pollution Control Act identifies three types of penalties for violating provisions of the act: court imposed fines (RCW 90.48.140); civil damage awards (RCW 90.48.142); and civil penalties (RCW 90.48.144).

3.3.2.2 Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC)

Chapter 173-201A WAC was adopted by Ecology to establish water quality standards for surface waters of the state consistent with provisions of the federal Clean Water Act and the state's Water Pollution Control Act (Chapter 90.48 RCW). Surface waters of the state include:

> . . . lakes, rivers, ponds, streams, inland waters, saltwaters, wetlands and all other surface waters and water courses within the jurisdiction of the state of Washington (WAC 173-201A-020).

The surface water quality standards identify specific **classes of surface waters** and the characteristic beneficial uses associated with each class. The classes of surface water include: **Class AA**, extraordinary; **Class A**, excellent; **Class B**, good; **Class C**, fair; and **Lake Class** (WAC 173-201A-030). Class AA, Class A, Class B, and Class C designations apply to freshwater and marine water in general, while Lake Class, as the name suggests, applies strictly to lakes.

In general, the classes apply to surface water as follows:

- All surface waters lying within national parks, national forests, and/or wilderness areas are classified Class AA or Lake Class.

- All lakes and their feeder streams within the state are classified as Lake Class and Class AA respectively, except for those feeder streams specifically classified otherwise.

- All reservoirs with a mean detention time greater than 15 days are classified as Lake Class.

- All reservoirs with a mean detention time of 15 days or less are classified the same as the river section in which they are located.

- All reservoirs established on preexisting lakes are classified as Lake Class.

- All unclassified surface waters that are tributary to Class AA waters are classified as Class AA. All other unclassified water surface waters within the state are classified as Class A (WAC 173-201A-120).

The standards also assign the aforementioned classes to specific freshwater and marine surface water bodies. For example, the Olympic Peninsula's Big Quilcene River and its tributaries are classified as Class AA, Issaquah Creek in King County is Class A, and Crab Creek and its tributaries in the Columbia Basin are Class B. For most water bodies, the standards assign classes to specific freshwater stream or marine water segments. For example, the Yakima River is divided into two segments: from the headwaters to its confluence with the Cle Elum River, classified as Class AA, and from the confluence with the Cle Elum River to the mouth, classified as Class A. Similarly, Commencement Bay in Pierce County is divided into three segments, each with a separate classification (WAC 173-201A-130).

For each class of surface water, water quality **criteria** are assigned. The criteria establish standards for fecal coliform organisms; dissolved oxygen; total dissolved gas; temperature; pH; turbidity; aesthetics; and toxic, radioactive, or other deleterious materials (WAC 173-201A-030). A special exemption for total dissolved gas is provided for sections of the Columbia and Snake Rivers to allow for spilling of water at dams to allow for fish passage (WAC 173-201A-060). As conditioned through permits, the water quality criteria can be exceeded in **mixing zones** (WAC 173-201A-100). Such zones are defined as:

> . . . that portion of a water body adjacent to an effluent outfall where mixing results in the dilution of the effluent with the receiving water (WAC 173-201A-020).

In addition **short-term modifications** to the criteria may be permitted when necessary to accommodate essential activities or to respond to emergencies (WAC 173-201A-110).

The surface water quality standards enunciate the state's **Antidegradation Policy**, as generally guided by the Water Pollution Control Act (Chapter 90.48 RCW) and the Water Resources Act of 1971 (Chapter 90.54 RCW). The policy stipulates that existing beneficial uses of water are to be maintained and protected, and no further degradation of water that would interfere with existing beneficial uses will be allowed. Waters that are of higher quality than the criteria set forth in the surface water quality standards must be protected and maintained, and contamination that could reduce the existing water quality cannot be allowed except under certain conditions. Such conditions include:

- It must be clear that **overriding considerations of the public interest** will be served;

- All wastes and other materials and substances discharged from point sources to surface water must be provided with **all, known, available, reasonable, methods of prevention, control, and treatment** (often referred to as AKART) prior to discharge;

- Wastes and other materials and substances resulting from nonpoint sources discharged to surface water must be provided with all, known, available, reasonable, **best management practices** prior to discharge to surface water; and

- If water quality is reduced by introduction of wastes, the resulting water quality must still be adequate to fully support all existing beneficial uses (WAC 173-201A-070).

The standards provide for designation of **Outstanding Resource Waters**. This designation can be applied by Ecology through rule making to such waters as those in national parks or wilderness areas or in state parks or wildlife management areas as well as to waters that are documented aquatic habitat for state priority species or for populations of federally designated threatened or endangered species (WAC 173-201A-080).

At the time this chapter went to print, the final adoption process for revisions to the state surface water quality standards undertaken pursuant to requirements of the Clean Water Act had been recently completed by Ecology; however, the standards had not yet received approval from the U.S. Environmental Protection Agency (EPA). During the interim period between adoption of the revised standards and their approval by EPA, the existing (old) surface water quality standards described above remain in effect as Washington's water quality standards under the federal Clean Water Act. The revised (new) standards are being implemented by Ecology for new state waste discharge permits and renewals, but cannot be used for any Clean Water Act purposes such as National Pollutant Discharge Elimination System Permits or Clean Water Act Section 401 Certifications until approved by EPA.

The revisions of the surface water quality standards are intended to achieve two important goals: pollution prevention, and protection of threatened fish species. Some of the major provisions of the revised standards are as follows:

- The state will be able to set aside pristine waters when there is broad public support to do so;

- Increased pollution in water bodies that are already meeting water quality standards will be prevented and additional pollution of waters that violate water quality standards will be prohibited;

- The standards will provide for protection of salmon and other temperature-sensitive fish, such as bull trout and Dolly Varden, from temperatures that could harm their populations;

- A new indicator (enterococci) will be used to measure the amount of bacteria in marine waters that are not used for shellfish harvesting;

- New values will be established to measure ammonia in waters without salmon species;

- Fresh waters will be classified by actual use (such as fish habitat, swimming, and water supply), rather than by class (AA, A, B, C, and Lake classes);

- Ecology will be able to certify that dams meet water quality standards if operators follow specific procedures; and

- Ecology will be able to modify water quality standards under specific situations where attaining water quality criteria is not physically or economically feasible.

For information regarding the revised standards contact Susan Braley of Ecology's Water Quality Program at (360) 407-6414, or visit the following website: http://www.ecy.wa.gov/programs/wq/swqs.

3.3.2.3 Water Quality Standards for Ground Waters of the State of Washington (Chapter 173-200 WAC)

Chapter 173-200 WAC was adopted by Ecology to establish water quality standards for ground waters of the state intended to provide for protection of the environment and public health as well as protection of existing and future beneficial uses of ground waters (WAC 173-200-010). The standards extend the state's **Antidegradation Policy**, described in Section 3.3.2.2, to ground waters of the state (WAC 173-200-010) and establish numeric ground water quality **criteria** (WAC 173-200-010). The criteria adopt the primary and secondary drinking water maximum contaminant levels and maximum contaminant level goals established through provisions of the federal Safe Drinking Water Act. In addition, numeric criteria are established for approximately 100 carcinogens.

Consistent with the Antidegradation Policy, the standards identify protocols for establishing the **enforcement limit** for a contaminant for purposes of regulating the release of the contaminant from a source or activity to protect existing ground water quality. The enforcement limit is nearly always lower than the criteria and as close as possible to natural ground water quality in the vicinity of the source or activity (WAC 173-200-050). "Natural ground water quality" in this context means:

> . . . ground water quality that was present before any human-caused pollution (WAC 173-200-020).

The standards contain provisions for Ecology to identify and designate **Special Protection Areas**, areas with ground waters that require special consideration or increased protection because of one or more unique characteristics. Special Protection designation can be applied to:

- Ground waters that support a beneficial use or ecological system requiring more stringent criteria than drinking water standards;
- Ground waters such as Aquifer Recharge Areas (see section 3.3.4 below) and Wellhead Protection Areas (See Section 3.3.3 below) that are vulnerable to contamination; and
- Sole Source Aquifers (See Section 3.3.1.2 above) designated under the federal Safe Drinking Water Act.

Special Protection Areas are given consideration by Ecology when developing regulations, guidelines, and policies; when regulating sources and activities; and when prioritizing Ecology resources for ground water quality protection efforts. Special Protection Areas can be designated by Ecology on its own initiative, or in response to a request from a federal agency, another state agency, a tribe, or a local government (WAC 173-200-090).

3.3.2.4 State Waste Discharge Permit Program (Chapter 173-216 WAC)

Chapter 173-216 WAC was adopted by Ecology under authority of Chapter 90.48 RCW, the Water Pollution Control Act, to implement a state permit program to regulate the discharge of waste from industrial and commercial activities or operations into ground and surface waters of the state as well as into municipal sewerage systems. However, the program does not apply to discharges of wastes into navigable waters of the state regulated under a National Pollutant Discharge Elimination System (NPDES) Permit (see Section 3.3.2.5 below), to activities regulated under the state's Underground Injection Control Program (Chapter 173-218 WAC; see Section 3.3.4 below), or to activities regulated under the Waste Discharge General Permit Program (see Section 3.3.2.6 below).

In addition, the following discharges are not subject to the permitting requirements of the program:

- Discharges of domestic wastewater to a municipal sewerage system from residential, commercial, or industrial facilities (domestic wastewater means water carrying human wastes, including toilet, baths/showers, sinks, and laundry wastes);

- Any discharge from an industrial or commercial facility to a municipal sewerage system for which authority to issue permits has been granted to the municipality under authority of Section 165 of Chapter 90.48 RCW, the Water Pollution Control Act, and Chapter 173-208 WAC;

- Any discharge from an industrial or commercial facility to a municipal sewerage system operating under, and in compliance with, the requirements of a local wastewater pre-treatment program;

- Discharges of domestic wastewater from any on-site sewage system with an ultimate design capacity of less than 14,500 gallons per day (such discharges are regulated under Chapter 246-272 WAC; see Section 3.3.4 below); and

- Discharges of domestic wastewater from a mechanical treatment system or lagoon with ultimate capacity of less than 3,500 gallons per day when followed by subsurface disposal (such discharges are regulated under Chapter 246-272 WAC; see Section 3.3.4 below) (WAC 173-216-050).

Chapter 173-216 WAC extends the discharge restrictions and prohibitions found in the state's Dangerous Waste Regulations (Chapter 173-303 WAC) to permits issued under the State Waste Discharge Program. Similarly, it extends prohibitions on discharges to municipal sewerage systems contained in the federal Clean Water Act to permits issued under the program (WAC 173-216-060).

Chapter 173-216 WAC contains procedures for obtaining individual State Waste Discharge Permits; for monitoring compliance with the terms and conditions of such permits; and for modification, suspension, or revocation of such permits (Chapter 173-216-130).

3.3.2.5 National Pollutant Discharge Elimination System Permit Program (Chapter 173-220 WAC)

Chapter 173-220 WAC was adopted by Ecology under authority of Chapter 90.48 RCW, the Water Pollution Control Act, to establish a state individual permit program to implement the National Pollutant Discharge Elimination System (NPDES) created under the federal Clean Water Act (see Section 3.3.1.1 above). Permits issued through the program regulate the discharge of pollutants and other wastes and materials to surface waters of the state and are designed to satisfy both federal Clean Water Act and state Water Pollution Control Act requirements (WAC 173-220-010).

WAC 173-220-020 stipulates that no pollutants can be discharged to any surface water of the state from a point source unless authorized by an individual permit issued under Chapter 173-220 WAC, or unless authorized by a general permit issued pursuant to Chapter 173-226 (see Section 3.3.2.6 below). A point source is defined as:

> . . . any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture (WAC 173-220-030).

Chapter 173-226 WAC describes the NPDES permit application process and the agency and public notification requirements. It also identifies certain prohibited discharges (WAC 173-220-120) and contains specific effluent discharge limits (WAC 173-220-130).

3.3.2.6 Waste Discharge General Permit Program (Chapter 173-226 WAC)

While Chapter 173-216 WAC and Chapter 173-220 WAC allow for issuance of individual State Waste Discharge Permits and National Pollutant Discharge Elimination System (NPDES) Permits, Chapter 173-226 WAC provides a process that allows Ecology to issue such permits as **general waste discharge permits**. General permits cover whole categories of dischargers within specific areas. The areas must correspond to existing geographic or political boundaries such as:

- Designated planning areas under Section 208 or 303 of the Clean Water Act;
- City, county, or state boundaries;
- State or county highway systems;

- Standard metropolitan statistical areas defined by the federal Office of Management and Budget;
- Urbanized areas as designated by the Bureau of the Census; or
- Any other appropriate division or combination of boundaries (WAC 173-226-050).

General discharge permits can be written to address storm water sources, or other categories of dischargers that meet all of the following criteria:

- Involve the same or substantially similar types of operations;
- Discharge the same of substantially similar types of wastes;
- Require the same or substantially similar effluent limitations or operating conditions as well as require similar monitoring; and
- In the opinion of Ecology, are more appropriately controlled under a general permit than under individual permits (WAC 173-226-050).

Chapter 173-220 WAC lists many of the same exemptions from permit requirements that are listed above in Section 3.3.2.4. Similarly, prohibited discharges are basically a composite of those found in Chapters 173-216 WAC and 173-220 WAC.

Ecology has issued a number of general permits under this regulation including a **dairy general permit**, a **construction stormwater general permit**, and an **industrial stormwater general permit**. Additionally, Ecology is using the general permit process to issue stormwater NPDES permits to municipalities in response to U.S. Environmental Protection Agency (EPA) regulations adopted under authority of the federal Clean Water Act. In July 1995, Ecology issued three **NPDES waste discharge general permits** to regulate municipal stormwater discharges by King, Pierce, and Snohomish Counties; the cities of Seattle and Tacoma; and the Department of Transportation. The three permits are referred to as the Cedar/Green Water Quality Management Area (WQMA), including Seattle and most of King County; the Island/Snohomish WQMA, including Snohomish County and a part of King County; and the South Puget Sound WQMA, including Tacoma, Pierce County, and part of King County. Washington State Department of Transportation is covered under all three of the general permits. Ecology is considering combining the three existing general permits into a single statewide permit and issuing a separate permit to the Department of Transportation (Ecology 2002).

The EPA regulations concerning municipal stormwater NPDES permits were recently made more stringent and will apply to a greater number of counties and cities. The original **Phase I stormwater NPDES requirements** applied to cities and counties whose population exceeded 100,000. The more recent **Phase II stormwater NPDES requirements** have much lower thresholds and extend to Benton, Clark, Cowlitz, Franklin, Kitsap, Spokane, Thurston, Whatcom, and Yakima Counties, as well as major municipalities within those counties. In addition, there are a number of municipalities in the state that will need to be evaluated by Ecology to determine whether the Phase II requirements apply. These municipalities include Aberdeen, Anacortes, Camas, Centralia, Chehalis, Ellensburg, Moses Lake, Mount Vernon, Oak Harbor, Port Angeles, Pullman, Walla Walla, and Wenatchee (Barrett 2002).

3.3.2.7 Total Maximum Daily Load (TMDL) Program and Its Relationship to Watershed Planning

Under requirements of Section 303(d) of the federal Clean Water Act, every two years each state is responsible for identifying and compiling a list of polluted surface water bodies within its jurisdictional boundaries and submitting that list, referred to as the **303(d) list**, to EPA. Such water bodies consist of estuaries, lakes, and streams that do not meet the state's surface water quality standards (see Chapter 173-201A above) and that are not expected to experience significant improvement in water quality during the subsequent two year period. The state's surface water quality standards are criteria intended to ensure that waters can be beneficially used for such purposes as fishing, fish habitat, swimming, boating, domestic water supply, industrial water supply and irrigation. The 303(d) list identifies both the locations of impaired waters and indicates the water quality standard or standards being exceeded as well as the extent of the exceedance or exceedances.

Using guidance provided by EPA, each state is required to set priorities and schedules for cleaning up polluted water bodies and to establish **Total Maximum Daily Loads (TMDLs)** for each affected water body. Establishment of a TMDL involves development of a cleanup plan based on the following process:

- **Collection of water quality data** to verify that the listed water body is impaired and/or to obtain additional information concerning the degree and nature of the impairment;

- Performance of **data analysis and mathematical modeling** to determine the maximum amount of the pollutant or pollutants causing the impairment that can be received by the listed water body and still meet water quality standards and support its intended beneficial uses (the Total Maximum Daily Load);

- **Setting allocations** or limits for the sources of the pollutant or pollutants;

- Development of **recommendations for controlling contributions** of the pollutant or pollutants; and

- Preparation of a **monitoring plan** to test the effectiveness of the TMDL.

For point sources of pollution (pollution discharging from a pipe or an activity or facility for which Ecology issues a wastewater or stormwater permit), the TMDL cleanup plan is implemented through placing appropriate limits on discharge permits. For nonpoint pollution sources (sources associated with diffuse land and water use activities), Ecology works with conservation districts, local governments, land owners, and citizens to implement best management practices.

Ecology may form an advisory committee to assist in developing a TMDL, including formulating strategies to achieve pollution reductions necessary to implement the TMDL. Sometimes an existing stakeholder group such as a Watershed Planning Unit formed under the Watershed Planning Act (Chapter 90.82 RCW) serves that function (Ecology 2000).

The Watershed Planning Act (Chapter 90.82 RCW) contains specific provisions concerning the optional water quality component of a watershed plan relating to TMDLs. According to the act, plans that have a water quality component must include the following:

> . . . a recommended approach for implementing the total daily maximum load established for achieving compliance with water quality standards for nonmarine water bodies in the watershed planning area unless a total maximum daily load process has begun in the planning area as of the date the watershed planning process is initiated (RCW 90.82.090).

3.3.3 State Drinking Water Program

More than five million of the state's approximately 5.9 million people obtain their drinking water from **public water systems** (DOH 2002). The state of Washington defines a public water system as:

> . . . any system providing water for human consumption through pipes or other constructed conveyances, excluding a system serving only one single family residence and a system with four or fewer connections all of which serve residences on the same farm (WAC 246-290-020).

As will be discussed in more detail below, the state recognizes two types of public water systems: Group A systems that are subject to regulation under the federal Safe Drinking Water Act, and smaller Group B systems that are regulated under only state laws and regulations. There are about 4,300 Group A public water systems in the state and about 12,500 Group B systems. A substantial majority of public water systems in the state are under private ownership; the remainder are owned by federal, state, and local governments (DOH 2002).

The general framework for the state's drinking water program is established by the **federal Safe Drinking Water Act**, described in Section 3.3.1.2. The Safe Drinking Water Act applies primarily to public water systems with 15 or more service connections or regularly serving at least 25 people per day. The act includes water quality standards for drinking water contaminants; in total, about 100 such contaminants are regulated under the Safe Drinking Water Act. The water quality standards are in the form of **maximum contaminant levels** and **maximum contaminant goals**. The Safe Drinking Water Act also contains requirements for water treatment, water quality monitoring and reporting, operator certification, public notification, and source protection, including development of Wellhead Protection Programs.

Under an agreement with the Environmental Protection Agency, the state Department of Health has complete authority and responsibility for implementing the Safe Drinking Water Act in Washington State. This assignment of authority and responsibility is referred to as **primacy**. In accepting primacy, the Department of Health is obligated to adopt and implement rules that are at least as stringent as federal requirements (DOH 2002).

Chapter 43.20 RCW, entitled State Board of Health, grants authority to the State Board of Health to adopt rules:

> . . . necessary to assure safe and reliable public drinking water and to protect the public health (RCW 43.20.050).

Chapter 70.119A RCW, entitled Public Water Systems – Penalties and Compliance, directs the Department of Health to administer a drinking water program which:

> . . . includes, but is not limited to, those program elements necessary to assume primary enforcement responsibility for part B and section 1428 of part C of the federal safe drinking water act (RCW 70.119A.080.).

Two state Board of Health adopted rules form the basis of the Department of Health's drinking water program: **Chapter 246-290 WAC**, Public Water Supplies, and **Chapter 246-291 WAC**, Group B Public Water Systems. Chapter 246-290 WAC, administered by the Department of Health's Division of Drinking Water, WAC regulates **Group A** public water systems. As noted previously, Group A systems are subject to the regulation under the federal Safe Drinking Water Act. Group A systems consist of both **community** and **non-community** systems. Group A community systems are defined as a water system that provide service:

> . . . to fifteen or more service connections used by year-round residents for one hundred eighty or more days within a calendar year, regardless of the number of people, or regularly serving at least twenty-five year round residents (WAC 246-290-020).

Examples of Group A community systems include those serving a municipality, subdivision, apartment building, mobile home park, or nursing home.

Group A non-community systems can be either **non-transient** or **transient**. Group A non-transient systems include those that provide service:

> . . . to twenty-five or more of the same nonresidential people for one hundred eighty or more days within a calendar year (WAC 246-290-020).

Examples of Group A non-transient systems include those serving a school or day care center, or it could include a business, factory, or restaurant with more than 25 employees on premises. Group A transient systems include those that provide service to:

> . . . A) Twenty-five or more different people each day for sixty or more days within a calendar year;
>
> B) Twenty-five or more of the same people each day for sixty or more days, but less than one hundred and eighty days within a calendar year; or

C) One thousand or more people for two or more consecutive days within a calendar year (WAC 246-290-020).

Examples of Group A transient systems include those serving a restaurant, motel, tavern, campground, park, fairground, musical concert facility, or a church.

Chapter 246-290 WAC contains extensive provisions governing public water system design, operation, water conservation, and water quality monitoring. It requires water systems to prepare planning documents that demonstrate each system's operational, technical, managerial, and financial capability to achieve and maintain compliance with relevant local, state, and federal plans and regulations (WAC 246-290-100; WAC 246-290-105). It also includes provisions for **interties** among public water systems, as enabled by Chapter 90.03 RCW, the state's Water Code (WAC 246-290-132).

Chapter 246-290 WAC contains requirements for source water protection (WAC 246-290-130). Source water protection includes development of **Wellhead Protection Programs** for public water system using ground water as a source of water, or **Watershed Control Programs** for public water systems using a surface water source or ground water under the influence of surface water (for example ground water that exhibits the characteristics of nearby surface water). In developing a Wellhead Protection Program, a public water system is required to delineate a **Wellhead Protection Area** for each well. The boundaries of such an area reflect the land area overlying the portion of an aquifer system that would contribute water to a specific well within a ten year period.

A public water system is required to conduct an inventory of potential contaminant sources within its Wellhead Protection Area or areas, notify the owners/operators of each identified potential contaminant source of their presence within a Wellhead Protection Area, and notify each jurisdictional contaminant source control agency of the findings of the inventory. Watershed Control Programs involve conducting an inventory of potential contaminant sources as well as development of watershed control measures.

Group B public water systems are regulated under Chapter 246-291 WAC. Group B systems are systems that meet the basic definition of a public water system cited above, but fall under the thresholds stipulated for community and non-community Group A systems. Chapter 246-291 WAC is intended to define basic regulatory requirements for Group B systems to help ensure reliability of such systems and to protect the health of consumers. Chapter 246-291 WAC provides for the development of a joint plan of operation between the Department of Health and individual local health jurisdictions. In those counties and municipalities covered by a joint plan of operation, authority for implementation of the Group B regulations is transferred to the local health jurisdiction (WAC 246-291-030).

One additional element of the state's Drinking Water Program is coordination of planning among public water systems enabled by Chapter 70.116 RCW, the Public Water System Coordination Act of 1971. This act allows for designation of **Critical Water Supply Service Areas** by the state Department of Health or a county legislative authority (council or commission). A Critical Water Supply Service Area is a geographic area in which water supply problems related to uncoordinated planning, inadequate water quality, or unreliable service appear to exist (RCW 70.116.040). Such designation triggers the development of a **Coordinated Water System Plan** to address identified problems (RCW 70.116.050). Development of a Coordinated Water System Plan is overseen by a Water Utilities Coordinating Committee consisting of representatives of public water systems within the Critical Water Supply Service Area, jurisdictional health and planning agencies, and the local legislative authority.

3.3.4 Other Selected State and Local Water Quality Related Laws, Regulations, and Programs

Some additional selected water quality related laws, regulations, and programs are summarized by subject in Table 3-3 below.

TABLE 3-3
Selected Water Quality Laws, Regulations, and Programs

Law, Regulation, Program	*Provisions/Effect*
General Laws and Regulations	
Sediment Management Standards (Chapter 173-204 WAC)	Chapter 173-304 WAC was adopted by Ecology to establish sediment standards for marine, low-salinity, and fresh surface waters.
Underground Injection Control Program (Chapter 173-218 WAC)	Chapter 173-218 WAC was adopted by Ecology to set forth administrative procedures and a permitting process to regulate injection of contaminated fluids through wells.
Federal Water Pollution Control – Establishment of Implementation Procedures of Application for Certification (Chapter 173-225 WAC)	Chapter 173-225 WAC establishes administrative procedures for Ecology implementation of the provisions of Section 401 of the Clean Water Act described in Section 3.3.1.1.
Reclaimed Water Use (Chapter 90.46 RCW)	See Section 3.1.7 above.
Construction in State Waters (Hydraulic Code) (Chapter 77.55 RCW)	See Section 3.4.9.1 below.
Critical Areas Ordinances under Chapter 36.70A RCW	See Section 3.5.4 below.
Hazardous Substances/Hazardous Waste	
Hazardous Waste Management (Chapter 70.105 RCW	This statute establishes a comprehensive, statewide framework for the planning, regulation, control, and management of hazardous waste for purposes of preventing air, soil, and water pollution and conserving the state's natural, economic, and energy resources.
Dangerous Waste Regulations (Chapter 173-303 WAC)	Chapter 173-303 WAC implements the Hazardous Waste Management Act. It designates dangerous and extremely hazardous wastes; creates a cradle to grave system for tracking hazardous wastes; and provides requirements for the design, operation, monitoring, and closure of hazardous waste transfer, treatment, storage, and disposal facilities.

Law, Regulation, Program	*Provisions/Effect*
Model Toxics Control Act/Hazardous Waste Cleanup (Chapter 70.105D RCW)	This act establishes the legal framework for cleanup of sites that have been contaminated by hazardous substances. The act also establishes the state's Toxic Control Account for funding solid and hazardous waste programs in state and local governments and for funding site cleanup activities.
Model Toxics Control Act – Cleanup (Chapter 173-340 WAC)	Chapter 173-304 WAC was adopted by Ecology to establish administrative processes and standards to identify, investigate, and cleanup facilities where hazardous substances are located.
Underground Storage Tanks (Chapter 90.76 RCW)	This act establishes an underground storage tank program within Ecology designed, operated, and enforced in a manner that meets the designation requirements of the federal Resource Conservation and Recovery Act. Chapter 90.76 RCW establishes requirements for design, construction, and installation of underground tanks; notification to Ecology of the presence of tanks; and licensing and tagging of tanks. Rules adopted by Ecology to establish the state program are contained in Chapter 173-360 WAC.
Solid Waste	
Solid Waste Management – Reduction and Recycling Act (Chapter 70.95 RCW)	This act establishes a comprehensive, statewide program for solid waste handling, solid waste recovery, and solid waste recycling. Primary responsibility for administration of the program is given to local governments with state (Ecology) oversight. Related laws include: Waste Reduction (Chapter 70.95C RCW), Clean Washington Center (Chapter 70.95H RCW), and Municipal Sewage Sludge – Biosolids (Chapter 70.95J RCW).
Criteria for Municipal Solid Waste Landfills (Chapter 173-351 WAC)	Chapter 173-351 was adopted by Ecology to establish minimum statewide standards for all municipal waste landfills. Any landfill ordinances adopted by local health jurisdictions must be at least as stringent as the state's criteria. Additionally, the rule enables local heath jurisdictions to implement local landfill ordinances through a permit system.
Minimum Functional Standards for Municipal Solid Waste Handling (Chapter 173-304 WAC)	Chapter 173-304 WAC was adopted by Ecology to establish minimum functional performance standards for the proper handling of all solid waste materials originating from residences; commercial, agricultural, and industrial operations; and other sources. Local solid waste ordinances must be at least as stringent as the state's minimum functional standards.

Law, Regulation, Program	*Provisions/Effect*
	Nonpoint Pollution Associated with On-Site Sewage Systems
On-Site Sewage Systems Rules and Regulations of the state (Chapter 248-272 WAC)	This rule, administered by the Washington Department of Health (DOH), serves as the minimum requirements for the design, construction, and operation and maintenance of on-site sewage systems with flows of less than or equal to 14,500 gallons per day (over 14,500 regulated by Ecology under Chapter 173-216, Chapter 173-221 WAC, and Chapter 173-240 WAC). It also establishes limitations on density of such systems as well as requirements for setbacks to wells, springs, and surface water bodies. Local health jurisdictions are required to adopt on-site sewage regulations at least as restrictive as the state requirements. Systems with flows of at least 3,500 gallons per day, but less than 14,500 gallons per day are regulated by DOH, unless that authority is delegated to a local health jurisdiction. Chapter 248-272 contains standards for on-site sewage system performance, referred to as Treatment Standard 1 and Treatment Standard 2, and includes provisions for use of alternative systems.
Local on-site sewage regulations	Local on-site sewage regulations implement the requirements of Chapter 246-272 WAC together with any local requirements that are more stringent than the state standards. Adoption of on-site sewage regulations and implementation of on-site sewage programs is vested with local health jurisdictions.
	Nonpoint Pollution Associated with Stormwater Runoff
Local stormwater/drainage ordinances	Many counties and cities have ordinances or regulations controlling runoff associated with a variety of land use activities. Generally, these ordinances and regulations seek to control releases of stormwater and/or the rate of releases to downstream properties and waterways as well as to control erosion and sedimentation. This may involve the use of detention or retention facilities, retention of open space or green belts, use of cluster development practices, and controls on pervious surfaces.
	Nonpoint Pollution Associated with Forest Practices
Forest Practices Act (Chapter 76.09 RCW)	See Section 3.4.5 below.
Washington State and U.S. Forest Service Memorandum of Agreement	Under this agreement, the U.S. Forest Service is conducting a program that involves repairing, maintaining, and in some cases, closing forest roads to better protect water quality. The agreement affects roads in the Colville, Gifford Pinchot, Mount Baker-Snoqualmie, Okanogan, Olympic, Wenatchee, and Umatilla National Forests in Washington State.
	Nonpoint Pollution Associated with Mining
Surface Mining (Chapter 78.44 RCW)	This act provides authority for the Washington Department of Natural Resources to regulate activities associated with surface mines involving three or more acres of disturbed area. It includes requirements for reclamation permits for individual mines, or in cases where two or more mines abut each other, joint reclamation plans may be required. Department of Natural Resources may delegate some or all of its surface mine enforcement responsibilities to counties, cities, or towns under contract.

Law, Regulation, Program	*Provisions/Effect*
Metals Mining and Milling Operations (Chapter 78.56 RCW)	This act authorizes Ecology to regulate the design, construction, and operation of facilities for mining and milling of metal ores. It also includes special requirements for State Environmental Policy Act (Chapter 43.21C RCW) compliance.
Local land use plans, zoning codes, and grading and filling ordinances	Local governments employ a number of strategies to manage water quality risks associated with mining activities. Some counties designate areas or lands that they consider appropriate for mineral resource extraction through their comprehensive land use plans and zoning codes. A zoning conditional use permit may be required for mines. Additionally, some local governments have grading ordinances, critical areas ordinances, or similar ordinances that can regulate surface mining activities that do not meet the thresholds set forth in Chapter 78.44 RCW.
Nonpoint Pollution Associated with Agriculture	
Dairy Nutrient Management Act (Chapter 90.64 RCW)	The act requires Ecology to register and inspect farms that produce and commercially sell milk, and conduct inspections of such farms. It also requires that each farm develop a Dairy Nutrient Management Plan that must be approved by the jurisdictional Conservation District.
Dairy General Permit	The Dairy General Permit issued by Ecology directs farmers to implement specific measures to keep manure and contaminated runoff out of lakes, streams, and ground water.
Washington Pesticide Control Act (Chapter 15.58 RCW) and Washington Pesticide Application Act (Chapter 17.21 RCW)	Under these acts, the Washington Department of Agriculture conducts pesticide registration and quality control sampling; licenses individuals who apply, sell, or consult regarding pesticides; restricting use of certain pesticides, and investigates suspected pesticide related violation. These acts help implement provisions of the Federal Insecticide, Fungicide, and Rodenticide Act.
Agricultural technical assistance programs by local conservation districts and the Natural Resource Conservation Service	Many of the local conservation districts around the state collaborate with the Natural Resource Conservation Service in providing technical assistance and outreach to irrigation districts and farmers concerning agricultural best management practices for water quality protection. The role of conservation districts is addressed in more detail in Section 3.4 below.
Regulation of Detergent Phosphorus Content	
Detergent Phosphorus Content (Chapter 70.95L RCW)	This act limits concentrations of phosphorus contained in household laundry and dishwashing detergents sold in Washington State. Detergents intended for commercial and industrial purposes are exempt.
Water Quality Protection Programs or Plans	
Aquifer Protection Areas (Chapter 36.36 RCW)	Chapter 36.36 RCW allows for creation of local Aquifer Protection Areas to finance protection and/or rehabilitation of ground water quality through fees placed on water connections and/or on-site sewage systems. A county legislative authority (commission or council) can adopt a resolution identifying: 1) the boundaries of a proposed Aquifer Protection Area, 2) the amount of fees to be levied, 3) the uses to which the fees will be put, and 4) the number of years the fees will be collected. The proposed Aquifer Protection Area must be approved by a simple majority of voters within the identified boundaries.

Law, Regulation, Program	*Provisions/Effect*
Ground Water Management Programs (Chapter 90.44 RCW and Chapter 173-100 WAC)	The law and rule establish guidelines, criteria, and procedures for the designation of local Ground Water Management Areas, formation of Ground Water Advisory Committees, and preparation of Ground Water Management Programs. In addition to water quality provisions, elements of Ground Water Management Programs may also address water quantity issues. Ground Water Management Programs must be certified by Ecology to be consistent with Chapter 173-100 WAC.
Local Planning and Management of Nonpoint Source Pollution (Chapter 400-12 WAC)	Chapter 400-12 WAC was adopted by the Puget Sound Water Quality Action Team to establish criteria and procedures for ranking watersheds by county governments within the Puget Sound basin for purposes of prioritizing the preparation of watershed action plans to address nonpoint pollution problems. Under the procedures, a lead agency is identified and a local watershed management committee is formed to develop a watershed action plan for each ranked watershed. Completed plans are submitted to Ecology for approval. Plans are implemented by the lead agency through a combination of voluntary actions; local ordinances; and local, state, and federal laws, regulations, and programs.
Puget Sound Water Quality Protection (Chapter 90.71 RCW)	This act adopts the state policy to implement the Puget Sound Water Quality Management Plan and to consider for inclusion a recovery plan developed under the federal Endangered Species Act. The act also establishes the Puget Sound Water Quality Action Team and authorizes the team to develop a biennial work plan that delineates state and local actions necessary to protect and restore the biological health and diversity of Puget Sound. The team performs public outreach, administers PIE grant program, and coordinates that Puget Sound Ambient Monitoring Program.
Local land use plans	See Section 3.5.1 through 3.5.4 below.
Shoreline master programs under Shoreline Management Act of 1971 (Chapter 90.58 RCW)	See Section 3.5.5 below.
Water Quality Funding Programs	
State Water Quality Account established under Water Pollution Control Financing Act (Chapter 70.146 RCW)	Chapter 70.146 RCW established the state's Water Quality Account funded primarily by a tax on tobacco (Chapter 82.24 RCW, Tax on Cigarettes). The funding program created to disburse funds in the account is known as the Centennial Clean Water Fund. The fund, administered by Ecology, is used to provide loans and matching grants to local governments to fund water pollution control facilities and activities.
State Revolving Fund	The State Revolving Fund is a federal funding program administered by Ecology. Through use of this fund, Ecology awards low-interest loans to local governments for water pollution control projects. The state provides a 20 percent match to funds received by the federal government.

Law, Regulation, Program	*Provisions/Effect*
Clean Water Act Section 319 Nonpoint Source program	The Section 319 Nonpoint Source program provides assistance to public entities and not-for-profit organizations to manage nonpoint source pollution as well as to protect and, where possible, improve water quality. The Section 319 program is administered by the Department of Ecology. For some qualifying projects, Ecology is able to partially match the federal funds using Centennial Clean Water Act funds.
Sewerage, Water, and Drainage Systems (Chapter 36.94 RCW)	Chapter 36.94 RCW, commonly known as the county services act, provides authority for counties to develop, operate, and finance sanitary sewer, stormwater, public water supply, and drainage systems. It also provides authority to counties to implement and finance provisions of Aquifer Protection Districts under Chapter 36.36 RCW, Lake Management Districts under Chapter 36.61 RCW, and Shellfish Protection Districts under Chapter 90.72 RCW.

3.4 HABITAT

The primary focus of this section is to identify laws, regulations, and policies related to threatened and endangered fish species listed under the federal Endangered Species Act as well as salmon recovery programs and activities undertaken within the state of Washington to address such listed fish species. The Watershed Planning Act stipulates that if initiating governments choose to include a habitat component in their watershed plan, the plan must be coordinated or developed to protect or enhance fish habitat within the management area. Any habitat planning conducted under provisions of the act must be integrated with strategies developed under other processes to respond to potential and actual listings of salmon and other fish species as threatened or endangered under the federal Endangered Species Act. In watersheds where salmon habitat restoration activities are being undertaken under provisions of the Salmon Recovery Act (Chapter 77.85 RCW), such activities are to be relied upon as the primary nonregulatory fish habitat component for watershed plans (RCW 90.82.100).

3.4.1 Federal Endangered Species Act

The federal **Endangered Species Act** was enacted by the U.S. Congress in 1973 in response to concerns over the decline of a number of fish and wildlife species. The purposes of the Endangered Species Act are to protect endangered or threatened species and to provide a means for conservation of their ecosystems. Congress has reauthorized the act seven times since 1973. The act was due for reauthorization in 1993; however, legislation to achieve that end has not been enacted. Congress continues to appropriate funding for the Endangered Species Act related programs allowing federal agencies to continue to implement conservation actions to endangered or threatened species (USFWS 2001).

Under the Endangered Species Act, the term **"endangered species"** is defined as:

> . . . any species which is in danger of extinction throughout all or a significant portion of its range . . . (16 U.S.C. 1532).

The term **"threatened species"** is defined as:

> . . . any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532).

The Endangered Species Act is administered by the Department of Interior's **U.S. Fish and Wildlife Service** and the Commerce Department's **National Oceanic and Atmospheric Administration (NOAA) Fisheries**. The Fish and Wildlife Service has primary jurisdiction of terrestrial (land) and freshwater species, while NOAA Fisheries has jurisdiction over marine species such as salmon and marine mammals. These agencies are authorized under the Endangered Species Act to list species as endangered or threatened through administrative rule making. The Endangered Species Act requires that decisions concerning the listing of species are to be made based solely on the:

> . . . best scientific and commercial data available . . . after conducting a review of the status of the species and after taking into account those efforts, if any, being made by any state . . . to protect such species, whether by predator control, protection of habitat and food supply, or other conservation practices . . . (16 U.S.C. 1533).

Critical habitat for listed species can be designated at the time of listing, or within one year after listing (Ryan and Schuler 1998). The Endangered Species Act defines critical habitat as:

> (i) the specific areas within the geographic area occupied by the species at the time it is listed . . . on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed . . . upon a determination by the Secretary [of the Interior Department or Commerce Department] that such areas are essential for the conservation of the species (16 U.S.C. 1532).

NOAA Fisheries and the USFWS may elect not to designate critical habitat for a species if: (a) identifying critical habitat is expected to increase the risk of harm to a species or its habitat, (b) designating critical habitat provides no benefit to the species, or (c) there is high economic impact from designating critical habitat. When critical habitat is designated, federal agencies are prohibited from authorizing funding or carrying out actions that will result in irrecoverable impact to critical habitat.

Section 7 (16 U.S.C. 1536) of the Endangered Species Act directs all federal agencies to apply their existing authorities to conserve endangered and threatened species to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. The provisions of Section 7 apply to management of federal lands as well as other federal actions that may affect listed species or critical habitat such as federal funding of activities or federal approval of private activities through the issuance of federal permits, licenses, or other authorizations (USFWS 2000).

Section 7 requires that federal agencies undertaking one of the aforementioned federal actions to contact the Fish and Wildlife Service and NOAA Fisheries to determine whether listed species are present within the **action area**. The action area represents all areas that would be directly or indirectly affected by the federal action. It is based on a biological determination of the reach or extent of the proposed action on listed species (USFWS 2000). Fish and Wildlife Service and NOAA Fisheries provide a list of species that are known to occur or may occur in the general vicinity. If no listed species are identified, no further Endangered Species Act related actions are necessary unless new information becomes available indicating that a listed species may be affected (USFWS 2000).

If listed species are present, the federal agency must determine whether the proposed action may affect them (USFWS 2000). For federal actions that are considered "major construction activities," as defined in the National Environmental Policy Act (42 U.S.C. 4332), a federal agency undertaking the action must prepare a **biological assessment** to assist in the determination of whether the action will affect listed species or critical habitat (USFWS 2000).

A "**may affect**" determination includes both actions that are not likely to adversely affect as well as those that are likely to adversely affect listed species. If the federal agency determines that the proposed action is not likely to adversely affect listed species (for example, the impacts are negligible or beneficial) and the Fish and Wildlife Service or NOAA Fisheries, as applicable, agrees with the determination, the applicable fisheries agency will provide concurrence in writing and no further consultation is necessary (USFWS 2000).

If, however, the federal agency determines that the action is likely to have an adverse affect on listed species, then it must make a written request to the Fish and Wildlife Service or NOAA Fisheries, as applicable, to initiate **formal consultation**. From the date formal consultation is initiated (the point at which a determination is made that the federal agency has made a complete submittal of necessary information), the Fish and Wildlife Service or NOAA Fisheries, as applicable, is allowed 90 days to consult with the federal agency and applicant, if any (USFWS 2000). The applicant in this context would be a private applicant for a federal permit that creates the federal nexus that triggers Section 7 consultation. Such applicants have a right to participate in the consultation and to comment on the draft biological opinion (described below) prior to its release. Under a recent joint order by the Secretaries of Interior and Commerce, federal agencies must also consult with any federally recognized tribe whose lands, trust resources, or treaty rights may be affected by any decision or determination implementing the Endangered Species Act (Ryan and Schuler 1998).

Following the 90-day consultation period, the Fish and Wildlife Service or NOAA Fisheries have 45 days to prepare a **biological opinion**. The biological opinion is a document that represents the product of formal consultation, and contains the opinion of the Fish and Wildlife Service or NOAA Fisheries regarding whether the federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification to habitat. In cases where it is determined that the federal action will jeopardize endangered species, the biological opinion must offer reasonable and prudent alternatives concerning the manner in which the project could be modified to avoid jeopardy. If the federal agency rejects the alternatives, the federal action is terminated (Ryan and Schuler 1998).

Section 9 (16 U.S.C 1538) of the Endangered Species Act makes unlawful for a person to **"take"** an endangered species. Take is defined in the act as:

> . . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct (16 U.S.C. 1532).

Threatened species are generally protected by the USFWS using this same definition of "take", whereas NOAA Fisheries defines "take" of threatened species on a species-specific basis.

If it is determined that the federal action will result in an incidental take of a listed species, the biological opinion will be accompanied by an **Incidental Take Statement** to exempt such takes from Section 9 prohibitions. The Incidental Take Statement contains any reasonable and prudent measures the Fish and Wildlife Service or NOAA Fisheries deems necessary to minimize taking of the species. The reasonable and prudent measures in the Incidental Take Statement are mandatory, and must become binding conditions of grants, permits, approvals, or authorizations of the federal agency (USFWS 2000).

An incidental take may also be authorized through a **Habitat Conservation Plan** or **HCP** prepared under provisions of Section 10 (16 U.S.C. 1539) of the Endangered Species Act. Non-federal entities such as private landowners or state and local governments can prepare Habitat Conservation Plans to address an otherwise lawful project or land or water use activity (for example, agriculture or forestry) that might result in the unintentional take of a listed species. A plan must describe the anticipated impact of a proposed taking on the affected species, how the take will be minimized and mitigated, and how mitigation measures will be funded (Nelson 1999).

A Habitat Conservation Plan must gain approval of the Fish and Wildlife Service or NOAA Fisheries, as applicable. Based on the approved Habitat Conservation Plan, the private landowner or government is authorized to incidentally take listed species through any activity that is undertaken in a manner consistent with the plan. This authorization is authorized through an **Incidental Take Permit**. A Habitat Conservation Plan applicant can also negotiate for long-term regulatory assurances that no additional mitigation measures will be required over the life of the project or activity, provided the plan is properly implemented (Ryan and Schuler 1998).

Without incidental take coverage, the Section 9 prohibited acts can be enforced through **civil actions** initiated by citizen groups under **Section 11** (16 U.S.C. 1540) of the act, or through action taken by the federal government. Remedies available to the federal government include **civil action** to obtain an injunction against an activity that is resulting in a take or to obtain **civil penalties** for a past take, or **criminal action** against intentional violations (Ryan and Schuler 1988).

Prohibited acts for endangered species that are enumerated in Section 9 do not automatically apply to threatened species. Authority to regulate threatened species is contained within Section

4 (16 U.S.C. 1533) of the act, specifically Section 4(d), which allows any or all of the Section 9 prohibitions to be applied to a threatened species. The Fish and Wildlife Service adopted regulations in 1978 that apply essentially all of the Section 9 prohibitions to each threatened species upon listing. NOAA Fisheries does not have a comparable blanket regulation; Section 9 prohibitions are applied to a threatened species through development of a special **4(d) rule** after listing (USFWS 1999).

For each species listed under the Endangered Species Act, the listing agency (U.S. Fish and Wildlife Service or NOAA Fisheries) is required to prepare a **recovery plan** describing the steps that would be needed to restore the species to health. The act encourages participation of the public and stakeholders in the development of recovery plans (USFWS 2001).

3.4.2 Salmon Recovery Act (Chapter 77.85 RCW)

In 1998, the state legislature responded to the Endangered Species Act listing of salmonid species through enactment of the Salmon Recovery Act (Chapter 77.85 RCW). Through this act, the state has asserted a leadership role in conducting planning and undertaking actions that will lead to recovery of listed species. The Salmon Recovery Act integrates local and regional salmon recovery activities into a single statewide salmon recovery plan or strategy (RCW 77.85.005). The act created the **Governor's Salmon Recovery Office** to manage development of the statewide **salmon recovery strategy** and to coordinate and assist in the development of **recovery plans** for Endangered Species Act listed salmon species (RCW 77.85.030).

The Salmon Recovery Act provides a process for establishment of an **Independent Science Panel** for purposes of helping to ensure that sound science is used in salmon recovery planning. The panel is responsible for review and preparation of findings concerning recovery plans and habitat project lists developed under the provisions of the act (RCW 77.85.040).

Habitat project lists consist of a compilation of habitat restoration projects, habitat protection projects, habitat projects that improve water quality, habitat projects that protect water quality, habitat-related aquatic mitigation projects, and habitat project maintenance and monitoring activities (RCW 77.85.010). The area for which a habitat project list is developed must be jointly designated by jurisdictional cities, counties, and tribes. Such areas are based on a WRIA, combination of WRIAs, or other area agreed to by the jurisdictional cities, counties, and tribes (RCW 77.85.050).

For each area, the jurisdictional cities, counties, and tribes must also identify a **Lead Entity**. The lead entity may be a county, city, conservation district, special district, tribal government, or a combination of those governments, other entity, or a combination of such governments and groups. The Lead Entity is responsible for establishing a committee consisting of representatives of counties, cities, conservation districts, tribes, environmental groups, business interests, landowners, citizens, volunteer groups, regional fish enhancement groups, and other habitat interests. The purpose of the committee is to provide a citizen-based evaluation of projects proposed for inclusion on the habitat project list (RCW 77.85.050).

Lead Entities can play an important role in watershed planning, especially where local planning units have elected to include a Habitat component in their watershed planning effort. For example, a planning unit can use a Lead Entity Strategic Plan (discussed below) to serve as all or part of the portion of its watershed plan related to habitat. Alternatively, a salmon recovery Lead Entity can consider undertaking recommended actions identified in a watershed plan such as stream gauging, instream flow studies, water conservation projects, and purchase or leasing of water rights. Thus, there is potential for considerable interaction between the two processes.

The Salmon Recovery Act requires use of a **critical pathways methodology** (referred to as **Strategic Plans** by Lead Agencies) in preparing the habitat project list and associated work schedule. This methodology involves evaluating limitations to healthy salmon populations, identifying habitat projects to address those limitations, and implementing an adaptive management strategy that measures the success of habitat projects and allows for adjustments to project activities as necessary. The critical pathways methodology is intended to help ensure that projects are prioritized and implemented in a logical sequential manner (RCW 77.85.060). Most Lead Entities have completed strategic plans, and such plans are available from the Department of Fish and Wildlife.

One element of a Lead Entity strategic plan is a **limiting factors analysis**, an analysis of conditions that limit the ability if habitat to fully sustain populations of salmon (RCW 77.85.060). To initiate the limiting factors analysis process, the Washington State Conservation Commission convened a **Technical Advisory Group** for each WRIA to participate in the limiting factors analysis. Invitations for participation in the Technical Advisory Group were extended to people with appropriate expertise, generally including representatives of private organizations, tribal entities, federal agencies, state agencies, and local governments. Each Technical Advisory Group is responsible for collecting and assembling known information regarding limiting factors related to habitat conditions in their WRIA, including fish passage areas and degraded estuarine areas, riparian corridors, stream channels, and wetlands. The results of the limiting factors analyses are being used by Lead Entity committees in prioritizing habitat projects and in identifying gaps in existing information to help focus future data collection efforts (WSCC 2002).

The Lead Entity committee is responsible, in conjunction with a technical review team, for compiling the list, establishing priorities for individual projects, and identifying potential funding sources (RCW 77.85.050). Once compiled, the Lead Entity is required to submit the list to the Salmon Recovery Funding Board established pursuant to the act (RCW 77.85.110).

The **Salmon Recovery Funding Board** is responsible for making grants and loans for salmon habitat projects and salmon recovery activities from funds appropriated by the legislature as well as funds received through grants and contributions from other agencies or entities. The board has authority to make rules as necessary to implement the Salmon Recovery Act (RCW 77.85.120). The board is comprised of five members appointed by the governor and confirmed by the State Senate. In addition, the Director of the Department of Fish and Wildlife, the Executive Director of the Conservation Commission, the Secretary of the Department of Transportation, and the Director of the Department of Ecology serve as *ex officio* members of the board. Administrative and staff support for the board is provided by the state's Interagency Committee for Outdoor Recreation (RCW 77.85.110).

The act requires the Salmon Recovery Funding Board to develop procedures and criteria for allocation of funds for salmon habitat projects and salmon recovery activities to:

> . . . address the highest priorities for salmon habitat protection and restoration (RCW 77.85.130).

The act stipulates that in evaluating, ranking and awarding funds, the board must give preference to projects that:

- Are based on the limiting factors analysis for the WRIA;
- Provide a greater benefit to salmon recovery based on the Department of Fish and Wildlife's **Salmonid Stock Inventory Status (SASSI)** and **Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP)** as well as any available comparable science-based assessment;
- Will give benefit to listed species and other fish species;
- Will preserve high quality salmonid habitat;
- Are the most cost effective;
- Have the greatest amount of matched or in-kind funding; and
- Will be implemented by a sponsor with a successful record of project implementation (RCW 77.85.130).

3.4.3 How Salmon Recovery Is Being Implemented

The state of Washington prepared and released its strategy for salmon recovery on September 1999. The goal of the strategy, entitled **Extinction Is Not An Option** (WSJNRC 1999), is to "restore salmon, steelhead, and trout populations to healthy, harvestable levels and improve the habitats on which fish rely". The strategy identifies factors contributing to the decline of salmon; provides a roadmap to recovery, including recognition of the role of regional response planning; identifies the core elements of recovery, and describes an adaptive management approach based on ongoing monitoring of the progress of recovery. The core elements of recovery are described as habitat protection and restoration, fish harvest management, hatchery management, and pursuing opportunities to reduce impacts to fish from hydropower facilities (WSJNRC 1999). For purposes of recovery planning, the Governor's Salmon Recovery Office has divided portions of the state that are affected by Endangered Species Act listing of salmonid species into the following seven **Salmon Recovery Regions**: Washington Coastal, Puget Sound, Lower Columbia, Middle Columbia, Upper Columbia, Northeast Washington, and Snake River. The boundaries of these regions were determined based on the boundaries for the Evolutionary

Significant Units established by NOAA Fisheries for Endangered Species Act listed salmonid species.

Implementation of the state's regional salmon recovery planning is being guided by the following tools:

- **Guidance on Watershed Assessment for Salmon** (WSJNRC 2001) – intended to assist entities involved in salmon recovery efforts understand what types of assessments are needed to support decisions about projects and other actions to protect and restore habitat for salmon;

- **Reference Guide to Salmon Recovery** (WSJNRC 2002) – intended to define what salmon recovery involves and who is participating in salmon recovery at various geographic scales; and

- **Roadmap for Salmon Habitat Conservation at the Watershed Level** (WSJNRC 2002a) – intended to help local participants in salmon recovery to take actions needed for salmon habitat conservation in their watershed and to relate their work to regional salmon recovery planning.

The Salmon Recovery Funding Board adopted its statement of **Mission, Roles and Responsibilities, and Funding Strategy** in June 2001, later amending the statement in September 2001. The Funding Strategy cites nine guiding principles that served as the basis for developing Salmon Recovery Funding Board policy; these guiding principles are summarized as follows:

> **Principle 1.** The primary role of the Salmon Recovery Funding Board is to help ensure the best possible investment of state and federal funds in salmon recovery activities, provide accountability for those investments, and provide citizen oversight to the funding process. The board will fund the most important salmon habitat projects and activities, reflecting current local priorities and using best available science.
>
> **Principle 2.** Successful salmon recovery requires decisions and actions guided by the best available science at each stream reach, watershed, recovery region, and at a statewide level.
>
> **Principle 3.** Where they have been established by federal, state, and tribal governments, salmon recovery goals should guide the identification and prioritization of habitat projects.
>
> **Principle 4.** The level of knowledge of habitat conditions and processes should guide the type and complexity of proposed habitat projects and priority of habitat project lists.
>
> **Principle 5.** Community support is essential for successful implementation of projects and projects should be designed and prioritized to build community support for overall recovery efforts.

Principle 6. Projects must identify the explicit objectives they are trying to accomplish and utilize adaptive management principles to improve success in meeting their objectives.

Principle 7. While lead entities are responsible for establishing funding priorities at the watershed level, the Salmon Recovery Funding Board is responsible for establishing funding priorities across watersheds.

Principle 8. Coordination across all levels of government and geographic scales is necessary to balance diverse interests, build community support, and provide for the efficient use of resources including the effective use of science for salmon recovery.

Principle 9. The Salmon Recovery Funding Board will continue to work with lead entities, project sponsors, the Independent Science Panel, NOAA Fisheries, and other interested parties to evaluate and improve the funding process (SRFB 2001).

Substantial progress has also been achieved in forming Lead Entities; currently, 26 Lead Entities are in operation within the state. Consistent with the Salmon Recovery Act, the lead entities consist of a coordinator (usually a county, conservation district, or tribal staff), a committee consisting of local technical experts, and a local citizens committee. Lead entities are assisted by the Washington Department of Fish and Wildlife's Watershed Stewardship Team in their local area, Washington Department of Fish and Wildlife's Lead Entity Program staff, and staff of the Interagency Committee for Outdoor Recreation (WDFW 2001-2002).

In 2001, the Washington Department of Fish and Wildlife published a model for linking the work of local Lead Entities to regional recovery planning. This model involves establishment of **regional recovery organizations**. Thus far, five regional recovery organizations have been established including the Lower Columbia Fish Recovery Board, Shared Strategy of Puget Sound, Yakima Basin Fish and Wildlife Recovery Board, Upper Columbia Salmon Recovery Board, and Snake River Salmon Recovery Board (WDFW 2001-2002). The boundaries of the Puget Sound, Lower Columbia, and Upper Columbia regional recovery organizations correspond to their respective Evolutionary Significant Units for salmonid species listed under the Endangered Species Act. The Yakima Basin regional organization represents a portion of the Evolutionary Significant Unit for Middle Columbia River steelhead; while the Snake River regional organization represents a portion of the Evolutionary Significant Units for Snake River chinook and steelhead. Of the regional recovery organizations, only the Lower Columbia Fish Recovery Board is created through statute (RCW 77.85.090).

Lead Entities are operating within each of the regional organizations, and the Washington Department of Fish and Wildlife is working to build strong coordination between Lead Entities and regional recovery organizations (WDFW 2001-2002). Some regional recovery organizations are engaged in reviewing and prioritizing in a regional context the habitat project lists developed by individual Lead Entities.

3.4.4 Northwest Power Planning Council Subbasin Planning

The Northwest Power Planning Council (recently renamed The Northwest Power and Conservation Council) was created by the federal Northwest Power Planning Act of 1980 to provide the citizens of Idaho, Montana, Oregon, and Washington greater involvement in decision making concerning power generated by federally owned dams on the Columbia River and fish and wildlife affected by such dams. The council is comprised of two members from each of the four states appointed by their respective governors. Funding for the council is provided from wholesale power revenues generated by the Bonneville Power Administration, the agency responsible for marketing power generated by the federal dams on the Columbia River (NWPPC 2002).

The Northwest Power Planning Act contained a mandate for the Northwest Power Planning Council to develop a program to protect and rebuild fish and wildlife populations that have been affected by hydropower development in the Columbia River Basin. In response to this mandate, the council adopted the 2000 Columbia River Basin Fish and Wildlife Program. The program created a framework for protecting and rebuilding fish and wildlife populations, but called for more specific objectives and measures to be developed through individual plans for tributary subbasins, referred to as **subbasin plans** (NWPPC July 2001). The key elements of a subbasin plan include:

- Assessment;
- Vision;
- Biological objectives;
- Strategies;
- Research, monitoring, and evaluation; and
- Supporting documentation (appendices) (NWPPC 2002a).

Subbasin plans are to be developed through the collaboration of tribal and state fish and wildlife managers, local governments, interest groups and stakeholders, and other state and federal land and water use managers with funding provide by the Northwest Power Planning Council. As plans are developed, the council will review and adopt them. The Council, the Bonneville Power Administration, the U.S. Department of Fish and Wildlife, and NOAA Fisheries propose to use the adopted plans to meet the requirements of a federal Endangered Species Act biological opinion regarding the federal Columbia River power system (NWPPC July 2001). Subbasin plans are to be completed by May 2004.

For purposes of subbasin planning, the Columbia Basin is divided into regional "provinces." Each province contains a number of subbasins. There are a total of 62 designated subbasins; of that number, approximately 30 subbasins encompass portions of Washington State including all of eastern Washington and a significant portion of southwest Washington.

Although subbasin planning, state salmon recovery planning under Chapter 77.85 RCW, and watershed planning under Chapter 90.82 RCW efforts are occurring simultaneously in some Water Resource Inventory Areas, there is currently no formal mechanism for coordinating the federal planning activities with state planning activities. However, the four regional recovery organizations within the Columbia River Basin (Upper Columbia, Yakima Basin, Snake River, and Lower Columbia) have elected to coordinate subbasin planning, regional salmon recovery, and watershed planning to the maximum extent practicable.

3.4.5 Forest Practices Act (Chapter 76.09 RCW)

The Forest Practices Act provides for management of public and private commercial forest lands in a manner that is intended to balance maintenance of a viable forest products industry with the need to protect natural resource attributes including forest soils, fisheries, wildlife, water quantity and quality, air quality, recreation, and scenic beauty (RCW 76.09.010). Forest practices include all practices related to growing, harvesting, and processing timber including such activities as road construction and maintenance, thinning, salvage, harvesting, reforestation, brush control, and application of fertilizers and pesticides (DNR 2002).

The Forest Practices Act provides for establishment of the state's **Forest Practices Board** and grants authority to the board to adopt **forest practices rules** (RCW 76.09.030-040). These rules are codified in **Title 222 WAC** and are administered by the Washington State Department of Natural Resources (DNR). The act also contains requirements for forest landowners to gain approval from DNR prior to initiating logging activities through a forest practices application and permit process (RCW 76.09.060-067).

The Forest Practices Act has been amended 13 times since it was enacted in 1975. The most recent amendment was entitled the **Forests and Fish Law**, adopted in 1999 in response to federal Endangered Species Act listing of salmon and steelhead. The Forests and Fish Law is considered an integral part of the state's salmon recovery strategy (WSJNRC 1999). The law was based on the Forests and Fish Report that was prepared through a collaborative process involving the state's private forest land owners; federal, state, and local governments; and tribes. The Forests and Fish Law contains requirements for private forestland owners to maintain or improve salmon habitat and water quality. Among the provisions of the law are requirements for improved road culverts to facilitate fish passage, enhanced road construction practices to reduce erosion and sedimentation, and enlarged stream buffers to provide better shading (Washington Forest Protection Association 2002).

Recognizing that implementation of the Forests and Fish Law provisions may be burdensome to small family-owned forest operations, the legislature authorized establishment of a **Small Forest Landowner Office** within DNR. This was accomplished through amendment of a code related to the Forest Practices Act (Chapter 76.13 RCW, Stewardship of Non-industrial Forests and Woodlands). The Small Forest Landowners Office provides technical assistance to small forestland holders in developing management and harvest plans (DNR 2002a). The office also promotes, implements, and manages the **Forestry Riparian Easement Program** (Chapter 76.13.120). The Forestry Riparian Easement Program partially compensates eligible small forest landowners in exchange for a 50-year easement for timber left unharvested near a river, lake, or wetland (DNR 2002b).

3.4.6 Watershed Restoration Plans and Projects under Chapter 89.08 RCW (Conservation Districts)

Chapter 89.08 RCW establishes the state Conservation Commission and enables the formation of local Conservation Districts. In addition, it establishes provisions for development of **Watershed Restoration Plans**. A Watershed Restoration Plan is defined as:

> . . . a plan, developed or sponsored by the Department of Fish and Wildlife, the Department of Ecology, the Department of Natural Resources, the Department of Transportation, a federally recognized Indian tribe acting within and pursuant to its authority, a city, a county, or a conservation district, that provides a general program and implementation measures for the preservation, restoration, re-creation, or enhancement of the natural resources, character, and ecology of a stream, a stream segment, drainage area, or watershed (RCW 89.08.460).

State Environmental Policy Act review of such plans is required and preparation of an environmental impact statement is required if the implementation measures or actions identified in the plan would have probable significant adverse impacts on the environment (RCW 89.08.460).

Watershed restoration projects are public or private projects authorized by the sponsor of a Watershed Restoration Plan for purposes of implementing the plan. Examples of watershed restoration projects include:

> . . . (a) A project that involves less than ten miles of streamreach, in which less than twenty-five cubic yards of sand, gravel, or soil is removed, imported, disturbed, or discharged, and in which no existing vegetation is removed except as minimally necessary to facilitate additional plantings;
>
> (b) A project for the restoration of an eroded or unstable stream bank that employs the principals of bioengineering, including limited use of rock as a stabilization only at the toe of the bank, and with primary emphasis on using native vegetation to control the erosive forces of flowing water; or
>
> (c) A project primarily designed to improve fish and wildlife habitat, remove or reduce impediments to the migration of fish, or enhance the fishery resource available for use by all of the citizens of the state, provided that any structure other than a bridge or culvert or instream habitat enhancement structure associated with the project is less than two hundred square feet in floor area and is located above the ordinary high water mark of the stream (RCW 89.08.460).

If a watershed restoration project meets the criteria of a fish habitat enhancement project as defined in Chapter 77.55 RCW, it is eligible for permitting under a streamlined permitting identified in that statute (see Section 3.4.9.3 below).

3.4.7 Aquatic Habitat Guidelines Program

In 1999, the governor's Salmon Recovery Office commissioned the state departments of Fish and Wildlife, Ecology, and Transportation to prepare technical guidance for governmental entities and watershed organizations undertaking protection and restoration of salmonid habitat. More recently, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service have also participated in this program. As the program has evolved, its scope has broadened to include the promotion, protection, and restoration of fully functioning marine, freshwater, and riparian habitat through comprehensive and effective management of activities affecting the state's aquatic and riparian ecosystems (WDFW 2000-2002).

The first set of guidelines, the **Integrated Streambank Protection Guidelines**, was recently released. These guidelines describe site and stream reach assessment methodologies, processes for developing solutions to identified habitat problems, and techniques for streambank protection. The general categories of protection techniques described in the guidelines include: flow-redirection, structural, biotechnical, internal bank-drainage, and avulsion-prevention (WDFW 2000-2002).

Other aquatic habitat guidelines under development include: fishway design, operation and evaluation; fish passage at culverts; and fish protection screens. A number of other aquatic habitat guidelines have been proposed subject to availability of future funding (WDFW 2000-2002).

3.4.8 Hatchery Programs and the Puget Sound and Coastal Hatchery Reform Project/Hatchery Scientific Review Group

Historically, fish hatcheries in Washington State have focused on the production of fish for harvest. However, since the listing of several salmonid species under the Endangered Species Act, hatcheries have assumed the additional role of conserving native salmon and steelhead stocks. The Washington Department of Fish and Wildlife operates 91 hatchery facilities, 69 of which are dedicated to salmon and/or steelhead production. About 30 of the state hatcheries are used in some capacity for wild salmon and/or steelhead stock conservation work. In addition, there are 35 tribal and 12 federal hatchery facilities in operation in the state. In order to ensure that hatcheries can carry out the dual role of wild stock conservation and production of fish for harvest, the Department of Fish and Wildlife has joined with tribal, federal, and private fish scientists in an effort to examine hatchery operations and identify opportunities for structural and operational improvements. The goal of this effort, referred to as the Puget Sound and Coastal Washington Hatchery Reform Project and facilitated by the non-profit group Long Live the Kings, is to ensure that best available science is developed and applied to hatcheries in fulfilling their dual role (WDFW 1997-2002; WDFW 2002).

In 2000, Congress appropriated funding for The Puget Sound and Coastal Washington Hatchery Reform Project, a systematic science-driven effort to evaluate how hatcheries could be used to help recover and preserve naturally spawning salmon and steelhead populations and support sustainable fisheries. One of the conditions of the appropriation was the establishment of an independent scientific panel to ensure a scientific foundation for hatchery reform. In response, the Hatchery Scientific Review Group was formed to assemble, organize, and apply the best available scientific information to provide guidance to policy makers responsible for implementing hatchery reform (HSRG 2002).

The Hatchery Scientific Review Group prepared or is in the process of preparing specific recommendations for ten regions: eastern Straits of Juan de Fuca, south Puget Sound, Stillaguamish/Snohomish Rivers, Skagit River, Nooksack/Samish Rivers, central Puget Sound, north coast, Grays Harbor, Willapa Bay, and Hood Canal. In addition, the group developed the following area wide recommendations that apply to the entire Puget Sound and coastal Washington:

- Take a regional approach to managing hatchery programs and coordinate activities through a regional technical group;
- Operate hatcheries in the context of their ecosystem;
- Measure success in terms of contribution to harvest and conservation goals;
- Emphasize quality, not quantity;
- Incorporate flexibility into hatchery design and operation;
- Evaluate hatchery programs regularly to ensure accountability for success;
- Develop a system of wild steelhead management zones;
- Use in-basin rearing and locally-adapted broodstocks;
- Take eggs over the natural period of the adult return;
- Develop spawning protocols to maximize effective population size; and
- Take into account both freshwater and marine carrying capacity in sizing hatchery programs (HSRG 2002).

3.4.9 Federal and State Regulatory Programs for Habitat Protection

There are a number of permitting programs at the federal and state level that serve to protect riparian and aquatic habitat. The most significant of these permitting programs are Hydraulic Project Approvals issued by the Washington Department of Fish and Wildlife, Clean Water Act Section 404 and Rivers and Harbors Act Section 10 Permits issued by the U.S. Army Corps of Engineers, and Clean Water Act Section 401 Water Quality Certifications and Coastal Zone Management Act Consistency Determinations issued by Ecology. These permits, approvals, and certifications are described in more detail below. There are also several types of local permitting programs that protect habitat including permits and approvals administered under authority of the state's Shoreline Management Act (Chapter 90.58 RCW) and those administered under the

Critical Areas provisions of the state's Growth Management Act (Chapter 36.70A RCW). Local permitting programs are described in Sections 3.4.10 and 3.5 below.

A number of federal, state, and local agencies have collaborated in the development of a single permit application for projects or activities that may affect aquatic resources known as a **Joint Aquatic Resource Permits Application** form or **JARPA**. This permit application can be used to apply for:

- Federal Clean Water Act Section 404 Permits, and Rivers and Harbors Act Section 10 Permits from the U.S. Army Corps of Engineers;
- Hydraulic Project Approvals from the Washington Department of Fish and Wildlife;
- Water Quality Certifications from the Department of Ecology;
- Aquatic Use Authorizations from the Washington State Department of Natural Resources; and
- Shoreline Management permits, Critical Areas permits, and floodplain management permits from local governments.

However, JARPAs are not necessarily accepted by all local governments.

3.4.9.1 Hydraulic Project Approvals under Chapter 77.55 RCW (Construction Projects in State Waters)

Chapter 77.55 RCW requires that any person or agency proposing to conduct construction activities or perform any other work that will use, divert, obstruct, or change the flow or bed of waters of the state must obtain a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife. The purpose of the approval process is to help ensure protection of fish and shellfish resources of the state and their habitat (RCW 77.55.100; RCW 77.55.110).

Examples of projects or activities in freshwater that require an HPA include: streambank protection and stabilization; construction of bridges, piers, and docks; channel change or realignment; pipeline crossings; culvert installation; dredging; excavation; placement of outfall structures; log, log jam, or debris removal; installation or maintenance of water diversion structures; and mineral prospecting. Examples of projects or activities in salt water that require an HPA include: construction of bulkheads, boat launches, piers, docks, dry docks, artificial reefs, marinas, and dredging (WDFW 1998-2001).

To obtain an HPA, a project proponent must provide the Department of Fish and Wildlife with a complete application and evidence of compliance with the State Environmental Policy Act. An HPA containing any conditions that the Department of Fish and Wildlife deems necessary to protect fish habitat is generally issued in writing within 30 of receipt of a complete application; although, by statute the department is allowed 45 days. However, if it is determined that the project will have a significant adverse impact on fish, shellfish, or their habitat that cannot be fully mitigated, the HPA may be denied (WDFW 1998-2001). Decisions by the Department of Fish and Wildlife concerning HPAs can be appealed to an administrative law judge or the state Hydraulic Appeals Board, depending on the statute or administrative code under which the decision was rendered.

Conditions applied to HPAs must be reasonably related to the project addressed by the approval. According to Chapter 77.55 RCW, such conditions must:

> . . . ensure that the project provides proper protection for fish life, but the department [of Fish and Wildlife] may not impose conditions that attempt to optimize conditions for fish that are out of proportion to the impact of the proposed project (RCW 77.55.350).

If placement of woody debris is required as a condition of an HPA, the Department of Fish and Wildlife must, if requested, invite comment regarding that condition from local governments, affected tribes, affected federal and state agencies, and the project applicant (RCW 77.55.120). In addition, recent modifications to Chapter 77.55 RCW limited the ability of the Department of Fish and Wildlife to include stormwater control conditions in HPAs. Specifically, HPAs for projects in locations covered by a National Pollutant Discharge Elimination System municipal stormwater general permit (see Section 3.3.2.6) can not be conditioned or denied for impacts arising from stormwater discharges. Under such circumstances, an HPA can only address construction of a stormwater outfall or associated structure.

The Department of Fish and Wildlife is authorized to issue expedited written permits in those instances where normal permit processing would result in undue hardship for the applicant or unacceptable damage to the environment. The department is also authorized to issue expedited written permits in cases of imminent danger. Imminent danger would involve some natural occurrence such as a weather event or flood that is likely to occur within 60 days of an application for permit. The Department of Fish and Wildlife or an affected local legislative authority (county commission or county council) must make a determination that imminent danger exists. Expedited written permits are to be issued within 15 days of application; however, such permits are not subject to SEPA compliance (RCW 77.55.100).

The Department of Fish and Wildlife can issue a verbal HPA in cases of **emergency** arising from weather, stream flow conditions, or other natural conditions. An emergency consists of:

> . . . an immediate threat to life, the public, property, or of environmental degradation (RCW 77.55.100).

Emergency approvals can be granted for removing obstructions to flow, repair of existing structures, restoring stream banks, or protecting property threatened by a stream or a change in stream flow. Any conditions placed on the verbal approval to protect fish, shellfish, or fish habitat must be put in writing within 30 days of the verbal approval.
As with imminent danger, the Department of Fish and Wildlife or an affected local legislative authority must make a declaration that an emergency exists.

Special provisions are contained in Chapter 77.55 RCW for approval of **fish habitat enhancement projects**. Fish habitat enhancement projects are defined as projects that accomplish one or more of the following tasks:

> (i) . . . Elimination of human-made fish passage barriers, including culvert repair and replacement;
>
> (ii) Restoration of an eroded or unstable stream bank employing the principle of bioengineering, including limited use of rock as a stabilization only at the toe of the bank, and with primary emphasis on using native vegetation to control the erosive forces of flowing water; or
>
> (iii) Placement of woody debris or other instream structures that benefit naturally reproducing fish stocks (RCW 70.55.290).

Approval of such projects can be accomplished though a number of means including, but not limited to:

- By the Department of Fish and Wildlife under provisions of the Salmon Enhancement Program (Chapter 77.95 RCW) or the Volunteer Fish and Wildlife Enhancement Program (Chapter 77.100 RCW) (see Section 3.4.10 below);
- By the Department of Fish and Wildlife as a department-sponsored fish habitat enhancement of restoration project;
- By the sponsor of a Watershed Restoration Plan developed pursuant to Chapter 89.08 RCW (see Section 3.4.6 above);
- Through the review and approval process for the Jobs for the Environment Program (see Section 3.4.10 below);
- Through the review and approval process for conservation district-sponsored projects, where the project complies with design standards established by the state Conservation Commission through interagency agreement with the U.S. Fish and Wildlife Service and the Natural Resources Conservation Service (Chapter 77.55.290); or
- Through a formal grant program established by the legislature or by the Department of Fish and Wildlife for fish habitat enhancement or restoration (RCW 77.55.290).

Chapter 77.55 RCW establishes a streamlined permitting process for fish habitat enhancement projects that exempts such projects from environmental review requirements of the State Environmental Policy Act (Chapter 43.21C RCW) and that precludes local governments from requiring permits or charging fees. If the Department of Fish and Wildlife determines that a project meets the criteria for a fish habitat enhancement project, local governments are provided with a 15-day comment period within which to provide input to the Department of Fish & Wildlife (RCW 77.55.290). A special addition to the Joint Aquatic Permits Application

(JARPA) form has been developed for use in the streamlined process for fish habitat enhancement projects.

It should be noted that in addition to the requirements for HPAs, Chapter 77.55 RCW contains numerous additional provisions for protecting fish and fish habitat. Among these are requirements for:

- Fish guards or screens to be installed at diversions from lakes, streams, and rivers to prevent fish from passing through the diversion structure and, where necessary constructing a means for fish to bypass the diversion (RCW 77.55.040; RCW 77.55.320);

- Fish passage facilities to be constructed at dams and other obstructions RCW 77.55.060); and

- Owners of dams or other obstructions where fish passage is not feasible to provide fish hatcheries or cultural facilities in lieu of passage (RCW 77.55.080).

Chapter 77.55 RCW also provides authority for the Department of Fish and Wildlife and state Department of Natural Resources to implement a **habitat incentives program**. The program allows a private land owner to enter into an agreement with either or both of the departments to enhance fish or wildlife habitat on private land in exchange for regulatory certainty with regard to future applications for an HPA or Forest Practices Permits on the property covered by the agreement. A single agreement can encompass up to 1,000 acres. A private land owner can enter into multiple agreements provided the total acreage covered under the agreements does not exceed 10,000 acres (RCW 77.55.280).

3.4.9.2 Section 404 Permits and Section 10 Permits

Sections 404 of the federal Clean Water Act and Section 10 of the Rivers and Harbors Act establish two permitting programs that are administered by the U.S. Army Corps of Engineers (Corps). The Clean Water act is described in more detail in Section 3.3.2.1 above.

Section 404 permits are required for projects that involve placing fill in waters of the United States (navigable waters). Section 10 permits are required for projects that will affect navigation such as construction or installation of docks, piers, and buoys. If a project will affect navigation as well as involve placement of fill, the Corps may review the project for compliance with both Section 404 and Section 10.

Section 404 and Section 10 permits can be issued as **nationwide permits** or **individual permits**. Nationwide permits are issued for classes of projects or activities that are likely to have minor or minimal impacts to water quality and aquatic habitat. There are currently about 40 different nationwide permits addressing such activities as installing utility lines, constructing roads, or conducting wetland restoration. Individual permits are generally required for more substantial projects with the potential for significant adverse impacts to water quality and habitat, or that may affect the habitat of endangered species (Ecology 2000).

3.4.9.3 Clean Water Act Section 401 Water Quality Certifications

Section 401 of the federal Clean Water Act provides an opportunity for states to approve, condition, or deny proposed projects requiring federal permits that might affect state waters. In Washington State, Ecology is responsible for administering the Water Quality Certification program.

Section 401 provides states with authority to review proposed projects for compliance with state aquatic protection regulations. It is one of the primary tools for protecting against and mitigating impacts to wetlands. The state's approval, referred to as a Water Quality Certification, is required before the affected federal permits can be issued, unless the state waives its certification authority. Water Quality Certifications are usually triggered when proposed projects are required to obtain a Clean Water Act Section 404 permit. Although, they are also triggered by some types of Federal Energy Regulatory Commission licenses for hydroelectric projects under the Federal Power Act. In evaluating a project as part of a Water Quality Certification, Ecology requires compliance with, as applicable, Hydraulic Project Approval requirements of Chapter 77.55 RCW, the State Environmental Policy Act (Chapter 43.21C RCW), and local shoreline master program requirements (see Section 3.5.5 below) (Ecology 2000).

Ecology reviews projects requiring Rivers and Harbors Act Section 10 permits, but does not usually invoke its 401 authority over such permits. Instead it relies, upon Coastal Zone consistency review (see Section 3.4.9.4) (Ecology 2000).

3.4.9.4. Coastal Zone Management Consistency

Ecology developed and currently operates the Washington State Coastal Zone Management Program under provisions of the federal Coastal Zone Management Act. The state's coastal zone is comprised of fifteen counties that border the Pacific Ocean or inland marine waters including: Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom counties. Wahkiakum County is included in the coastal zone because salinity impacts from the Pacific Ocean extend upstream in the Columbia River to that county.

The state program first received approval from the Office of Ocean and Coastal Resource Management, a division of the National Oceanic and Atmospheric Administration (NOAA), in 1976. Since then, Ecology has been eligible for annual federal grant funding for implementation of the state program. The state program does not rely on laws and regulations enacted or adopted specifically for the purpose of implementing a state Coastal Zone Management Program, but rather, relies on **enforceable policies** in a number of other state laws and regulations for implementation. These include the State Shoreline Management Act (Chapter 90.58 RCW), the Water Pollution Control Act (Chapter 90.48 RCW), the State Environmental Policy Act (Chapter 43.21C RCW), Energy Facility -- Site Location (Chapter 80.50 RCW), Washington Clean Air Act (Chapter 70.94 RCW), and the Ocean Resources Management Act (Chapter 43.143 RCW) (Ecology 2001).

Federal regulations developed under authority of the Coastal Zone Management Act contain provisions for a state to conduct determinations of consistency with its Coastal Zone Management Program for activities and development with federal involvement that may affect the coastal zone. In conducting consistency determinations, Ecology evaluates proposed activities or developments for consistency with the enforceable policies discussed.

3.4.10 Other Selected Habitat Laws, Regulations, and Programs

Additional selected habitat related laws, regulations, and programs are summarized in Table 3-4. The enumerated laws, regulations, and programs are listed by subject or topic.

TABLE 3-4
Additional Selected Habitat Related Laws, Regulations, and Programs

Law, Regulation, Program	*Provisions/Effect*
Additional Salmon Recovery/Watershed Restoration Related Laws, Regulations, and Programs	
Tribal and state salmon and steelhead fisheries co-management program	Washington's salmon and steelhead fisheries are managed cooperatively in a government (state)-to-government (tribes) relationship. Tribes involved in the co-management program are those with rights established through treaties signed with the federal government in the 1850's. Parties involved in the co-management program collaborate in establishing seasons and harvest levels for marine waters, inland waters, and rivers (WDFW 2000-2001).
Salmon Enhancement Program (Chapter 77.95 RCW)	This law authorizes the Washington Department of Fish and Wildlife to create and operate a program for forming Regional Fisheries Enhancement Groups to organize citizen volunteer involvement in salmon restoration efforts. Each Regional Fisheries Enhancement Group oversees a specific geographic region and is a separate, non-profit corporation. The groups propose and implement, subject to availability of funding, salmon recovery projects and perform public outreach. (WDFW 1999-2001).
Volunteer Fish and Wildlife Enhancement Program (Chapter 77.100 RCW)	This law authorizes the Washington Department of Fish and Wildlife to encourage and support the establishment of cooperative agreements for the development and operation of fish, shellfish, and wildlife projects that provide opportunities for volunteer groups to become involved in resource and habitat-oriented activities.
Washington State Highway System Fish Passage Program	The Washington State Department of Transportation and the Washington Department of Fish and Wildlife participate in a joint fish passage barrier removal program that, using Department of Fish and Wildlife criteria, assesses, prioritizes, and corrects fish passage barriers on the state's highway system. Over an 11-year period, the program has resulted in the assessment of about 2,300 river crossings, identification of almost 600 crossings as needing correction, and retrofitting or replacement of 94 crossings (WSDOT 2001).

Law, Regulation, Program	*Provisions/Effect*
U.S. Fish and Wildlife Coordination Act	This federal law requires that federal agencies consult with federal and state fish and wildlife agencies (U.S. Fish and Wildlife Service, NOAA Fisheries, and Washington Department of Fish and Wildlife) when considering projects that affect, control, or modify waters of the United States. Federal agencies proposing such projects must give "full consideration" to the recommendations of the fish and wildlife agencies. (Ecology 2001)
Conservation District and Natural Resources Conservation Service habitat restoration programs	Local conservation districts, in cooperation with the federal Natural Resources Conservation Service, engage in habitat restoration projects, such as removal of fish passage barriers, to implement Watershed Restoration Plans under Chapter 89.08 RCW, as well as other habitat restoration programs. Funding for conservation district activities can be provided through local assessments, grants from the Washington State Conservation Commission, and other grants.
Jobs for the Environment Program	The state of Washington administers a program to hire displaced forest products workers and workers from timber dependent communities in watershed restoration and other forest related activities. The Department of Natural Resources administers the program in cooperation with the Department of Fish and Wildlife, U.S, Forest Service, U.S. Fish and Wildlife Service, and the Environmental Enhancement and Jobs Creation Task Force. The Jobs for Environment Program restores and protects fish and wildlife habitat in watersheds with critical and depressed fish stocks. Grants for fish and wildlife restoration projects are awarded through a competitive grant process (WDFW 1997).
Washington Conservation Corps	The Washington Conservation Corps was established in 1983 to conserve, rehabilitate, and enhance the state's natural and environmental resources while providing educational opportunities and work experience for young adults. Currently, the Washington Conservation Corps has 25 crews assigned to work on a variety of watershed restoration and enhancement programs around the state (Ecology 2003c; Ecology 2001).
Additional Regulatory Programs for Habitat Protection	
Title 220 WAC: Fish and Wildlife Department (Fisheries) Chapter 220-12 WAC – Chapter 220-140 WAC	Title 220 WAC consists of a series of rules adopted for the purpose of implementing the statutory authority of the Washington Department of Fish and Wildlife related to fish and fisheries. This title includes: the Hydraulic Code Rules, Chapter 220-110 WAC, adopted under authority of Chapter 77.55 RCW (see Section 3.4.9.1 above); the Volunteer Cooperative Fisheries Enhancement Program, Chapter 220-130 WAC, adopted under authority of Chapter 77.100 RCW (described in this Section); and Regional Fisheries Enhancement Groups, Chapter 220-140 WAC, adopted under authority of Chapter 77.95 RCW (described in this Section).
Title 222 WAC: Forest Practices Board Chapter 222-08 WAC – Chapter 222-50	This title includes a series of rules adopted for the purpose of implementing statutory authority of the Department of Natural Resources relating to the Forest Practices Act, Chapter 76.09 RCW. This includes Chapter 222-22 WAC, which establishes rules for a watershed-based approach to managing forest practices.

Law, Regulation, Program	*Provisions/Effect*
Shoreline master programs developed under authority of the Shoreline Management Act (Chapter 90.58 RCW)	Local shoreline master programs and their role in protecting riparian and aquatic habitat are discussed in detail in Section 3.5 below.
Critical Areas development regulations formulated under authority of the state Growth Management Act (Chapter 36.70A RCW)	Local Critical Areas development regulations include those intended to protect wetlands and fish and wildlife habitat conservation areas, as well as to control development in frequently flooded areas. Critical Areas development regulations are discussed in detail in Section 3.5 below.
Local flood plain management ordinances adopted under authority of Chapter 86.16 RCW,	Local flood plain management ordinances discussed in Section 3.5 below.
Local clearing, filling, and/or grading ordinances	In communities where adopted, such local ordinances attempt to control erosion and sedimentation impacts associated with land clearing and grading activities.
Wetland Mitigation, Mitigation Banking and Stewardships	
Aquatic Resources Mitigation (Chapter 90.74 RCW)	Chapter 90.74 RCW authorizes innovative, compensatory mitigation measures by requiring the state Department of Fish and Wildlife and Ecology to consider mitigation proposals that are designed and located in a manner that will provide equal or better biological functions and values than traditional "on-site" and "in-kind" mitigation proposals. Ecology adopted an Alternative Mitigation Policy in February 2000.
Wetland Mitigation Banking (Chapter 90.84 RCW)	Chapter 90.84 RCW establishes a process under which state agencies, local governments, and private entities can establish, subject to oversight by Ecology, wetland mitigation banks. Under a wetland banking system, wetlands on a site or sites are restored, created, enhanced, or preserved for the purpose of providing compensatory mitigation for future impacts to similar resources on another site or sites.
Wetland Stewardship	The wetland stewardship program within Ecology is intended to help protect important wetland resources by working with agencies, corporations, and non-profit groups that have the ability to purchase outright or obtain conservation easements as necessary to protect such wetland resources. The program also encourages donations of lands with important wetland resources. Environmental Quality Incentives Program (EQIP)

Law, Regulation, Program	*Provisions/Effect*
Special State Designations for Species, Habitats, and Areas	
Priority Habitats and Species	The Washington Department of Fish and Wildlife develops and publishes a list of Priority Habitats and Species. Priority habitats are habitats or elements of habitats with unique or significant value to a diverse aggregation of species. Priority species require protective measures for their continued existence because of their population status, sensitivity to habitat alteration, and/ or recreational, commercial, or tribal importance. Priority species include state designated endangered, sensitive, and candidate species designated under Chapter 232-12 WAC (WDFW 1999). Priority Habitat and Species information is used by state agencies in processing Forest Practice Applications and Hydraulic Project Approvals, by local governments in developing Critical Area ordinances, and by government and private land owners in developing Habitat Conservation Plans.
Natural Areas Preserves under the Natural Areas Preserves Act (Chapter 79.70 RCW)	Chapter 79.70 RCW authorizes the Department of Natural Resources to receive as a grant, purchase, lease, set-aside, or exchange for lands that represent examples of the highest quality native ecosystems and rare plant and animal species. These lands are managed by the department as Natural Areas Preserves. Such preserves range in area from eight acres to 35,000 acres in size (DNR 2002c)
Natural Resources Conservation Areas under the Washington Natural Resources Conservation Areas Act (Chapter 79.71 RCW)	Chapter 79.71 RCW authorizes the Department of Natural Resources to receive as a grant, purchase, lease, set-aside, or exchange for lands that represent examples of habitats for endangered, threatened, and sensitive plant and animal species as well as examples of scenic landscapes. Lands with a high level of need for conservation and environmentally significant sites that are threatened by conversion to other uses are considered candidate sites for this program (DNR 2002).
Shellfish Protection Districts under Chapter 90.72 RCW	Chapter 90.72 RCW authorizes local legislative authorities (county councils or county commissions) to establish Shellfish Protection Districts to address nonpoint pollution problems that threaten water quality in shellfish farming or harvesting areas. Such districts include shoreline areas and upland areas that contribute drainage to waters supporting affected shellfish farming and harvesting areas.
Agriculture Related Laws, Regulations, and Programs	
Natural Resources Conservation Service and conservation districts technical and financial assistance programs	The federal Natural Resources Conservation Service and local conservation districts offer a number of technical and financial assistance programs to assist landowners and irrigation districts in soil, air, water, and habitat conservation. These programs include assistance in the development of farm plans and irrigation district management plans, dissemination of best management practices for fish and wildlife habitat protection and restoration, and preparation of conservation plans (by conservation districts) to enable property tax exemptions for habitat improvements. Two cost-share programs, the Conservation Reserve Enhancement Program and the Environmental Quality Incentives Program (EQIP) are discussed in more detail below.

Law, Regulation, Program	*Provisions/Effect*
Agriculture, Fish and Water	This process, facilitated by the Washington State Conservation Commission, was established to negotiate changes to the existing **Field Office Technical Guide (FOTG)** and the development of **Guidelines for Preparation of Comprehensive Irrigation District Management Plans**. Parties involved in the negotiations include the state departments of Agriculture, Fish and Wildlife, and Ecology; the Conservation Commission and Governor's Office; federal agencies; local governments; tribes; environmental groups; legislators; and representatives of the agricultural community (SCC 2002). The FOTG is the primary technical reference for the Natural Resources Conservation Service and conservation districts used in providing technical assistance to farmers and ranchers. It contains information regarding conservation of soils, water, air, plant, animal, and human resources (NRCS 2003).
Conservation Reserve Enhancement Program	The Conservation Reserve Enhancement Program is a program jointly administered by the Washington State Conservation Commission and the U.S. Department of Agriculture's Farm Service Agency for purposes of providing incentives to private landowners to restore and improve salmon and steelhead habitat. Under the program, private landowners voluntarily remove lands with salmon and steelhead habitat from agriculture and grazing under 10- and 15-year contracts. Landowners receive annual rent, incentive and maintenance payments, and cost share for habitat improvements. In return, landowners are expected to implement actions to stabilize stream banks and other habitat improvement measures.
Environmental Quality Incentives Program	The Environmental Quality Incentives Program (EQIP) is a federal incentives program that provides cost-share funding to farmers, ranchers, and tribes to implement measures that conserve soils, improve water and air quality, protect and restore wildlife habitat, and conserve surface and ground water. Funds can be allocated by the Natural Resources Conservation Service to individual farmers and ranchers as well as to irrigation districts and tribes.

3.5 LAND AND SHORELINE USE PLANNING AND MANAGEMENT

In Washington State, local land use planning is largely governed by three laws or statutes: Planning Commissions (Chapter 35.63 RCW); Planning and Zoning in Code Cities (Chapter 35A.63 RCW); and Planning Enabling Act (Chapter 36.70 RCW). These statutes provide the basic models under which counties and cities conduct land use planning. The state's Growth Management Act (Chapter 36.70A RCW) does not alter these basic planning models; however, it specifies the content of comprehensive plans, establishes planning criteria, and requires formulation of development regulations (OCD and PAW 1999). Land and water use along the state's fresh and marine water shorelines is governed under the Shoreline Management Act (Chapter 90.56 RCW). These laws are briefly summarized below along with several additional laws, regulations, and programs that affect land and shoreline use. In addition to the information provided below, the linkages between local planning under the Growth Management Act and watershed planning are documented in the following documents:

- *Guide to Watershed Planning and Management* (EES 1999); and

- *Guide to Watershed Planning and Management, Addendum No.1* (EES 2001).

These documents also contain valuable information concerning development of watershed plans and are hereby incorporated by reference pursuant to provisions of WAC 197-11-600 and WAC 197-11-635. They may be viewed, respectively, through the following web links:

> http://www.ecy.wa.gov/biblio/99106.html, and
>
> http://www.ecy.wa.gov/biblio/0206005.html.

3.5.1 Planning Commissions (Chapter 35.63 RCW)

Chapter 35.63 RCW provides authority for a county or city board or council to appoint a planning commission (RCW 35.63.020). Planning commissions are authorized to prepare:

> . . . coordinated plans for the physical development of the municipality (RCW 35.63.080).

To have legal standing, plans prepared under this statute must be approved by the jurisdictional county or city board or council, based on recommendations from its planning commission (RCW 35.63.080). Any development regulations enacted in response to requirements of the Growth Management Act (see Section 3.5.4 below) must be consistent with coordinated plans adopted under this statute (RCW 35.25.125).

3.5.2 Planning and Zoning in Code Cities (Chapter 35A.63 RCW)

This statute is part of the state's Optional Municipal Code (Title 35A RCW). The Optional Municipal Code is intended to provide two optional models for the general plan of government under which a city operates (RCW 35A.01.010). Chapter 35A.63 RCW specifically addresses planning and zoning in cities organized under the Optional Municipal Code, referred to as "code cities." Under Chapter 35A.63 RCW code cities are authorized to create a planning agency which can be a planning commission, a planning department, or a combination of both (35A.63.010; 35A.63.020). Each code city is required to direct its planning agency to prepare a comprehensive plan, in whole or successive parts, for:

> . . . anticipating and influencing the orderly and coordinated development of land and building uses of the code city and its environs (RCW 35A.63.060).

Comprehensive plans formulated under this statute are required to include a land use element that designates the distribution, general location, and extent of various land uses including agricultural, residential, commercial, industrial, recreational, educational, and public. The land use element of a comprehensive plan must:

> . . . provide for the protection of the quality and quantity of ground water used for public water supplies . . . (RCW 35A.63.060).

In addition, the land use element must:

> . . . review drainage, flooding, and storm water run-off [sic] in the area and nearby jurisdictions and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute Puget Sound or waters entering Puget Sound (RCW 35A.63.061).

Chapter 35A.63 RCW identifies a number of optional comprehensive plan elements including a conservation element for the conservation, development, and utilization of natural resources (RCW 35A.63.062).

The planning agency for a code city must hold public hearings on a proposed comprehensive plan before forwarding that plan to the jurisdictional city council or legislative body for approval. Once a comprehensive plan is approved, the city council or legislative body can enact zoning codes or other regulations as necessary to implement the provisions of the plan (RCW 35A.63.100). A code city must ensure that any development regulations enacted in response to requirements of the Growth Management Act (see Section 3.5.4 below) must be consistent with comprehensive plans adopted under Chapter 35A.63 RCW (RCW35A.63.105).

3.5.3 Planning Enabling Act (Chapter 36.70 RCW)

Chapter 36.70 RCW is directed specifically at counties and allows county legislative authorities to establish planning agencies consisting of either a planning commission together with its staff or a planning department functioning together with a planning commission (RCW 36.70.030; RCW 36.70.040). Upon creation of a planning agency, a county is authorized to engage in comprehensive planning. A county can also join with one or more county, city, town, school district, public utility district, port district, or other public or private organization in forming a regional planning commission and in conducting regional planning (RCW 36.70.060).

Each planning agency is responsible for developing a comprehensive plan for a county or portion of a county to provide for:

> . . . the orderly physical development of the county, or any portion thereof, and may include any land outside its boundaries which, in the judgment of the planning agency, relates to planning for the county (RCW 36.70.320).

Comprehensive plans are required to include a land use element similar to that required under Chapter 35A.63 RCW (described in Section 3.5.2). Optional comprehensive plan elements are generally similar to those enumerated in Chapter 35A.63 RCW; however, the limited discussion of the conservation element in Chapter 35A.63 RCW is expanded as follows:

> . . . a conservation element for the conservation, development and utilization of natural resources, including water and its hydraulic force, forests, water sheds [sic], soils, rivers

> and other waters, harbors, fisheries, wild life [sic], minerals, and other natural resources (RCW 36.70.350).

After a public hearing or hearings regarding a comprehensive plan have been held by the planning agency, the planning commission can approve the plan and forward it to the county legislative authority for approval. Based on recommendations from the planning agency, the county legislative authority can also adopt by ordinance "official controls," including zoning codes, necessary to implement the comprehensive plan (RCW 36.70.550).

A county must ensure that any development regulations enacted in response to requirements of the Growth Management Act (see Section 3.5.4 below) must be consistent with comprehensive plans adopted under Chapter 36.70 RCW (RCW36.70.545).

3.5.4 Growth Management Act (Chapter 36.70A RCW)

The state's Growth Management Act was enacted by the state legislature in 1990 in response to concerns over rapid, unplanned, and uncoordinated growth that was occurring in some portions of the state. The legislature found that such growth:

> . . . together with a lack of common goals expressing the public's interest in the conservation and wise use of our lands, pose a threat to the environment, sustainable economic development, and the health, safety, and high quality of life enjoyed by residents of this state (RCW 36.70A.010).

The legislature further found that:

> . . . it is in the public interest that citizens, communities, local governments, and the private sector cooperate and coordinate with one another in comprehensive land use planning (RCW 36.70A.010).

The Growth Management Act provides a more detailed planning framework than the Planning Enabling Act (Chapter 36.70 RCW) discussed. The act establishes goals for land use planning and a number of mandatory planning requirements that serve to express the state's interest in local land use planning decisions. The state's fastest growing counties, as well as cities within those counties, are required to prepare comprehensive plans consistent with the goals and mandatory requirements of the act. Counties and cities that are not required plan can chose to plan under the act (OCD and PAW 1999).

The goals set forth under the Growth Management Act address a wide range of issues associated with land use planning, including goals related to water resources, water quality, and habitat. Among these are goals related to:

- Retention of open space, enhancement of recreational opportunities, and conservation of fish and wildlife habitat; and

- Protection of the environment and enhancement of the state's high quality of life, including air and water quality as well as the availability of water (RCW 36.70A.020).

In addition, the legislature added the goals and policies set forth in the state's Shoreline Management Act of 1971 (Chapter 90.58 RCW) (see Section 3.5.5 below) to the goals of the Growth Management Act (RCW 36.70A.480).

The Growth Management Acts goals also provide direction concerning where counties and cities should direct additional development. Development is to be encouraged in urban areas where adequate public facilities and services can be provided. Public facilities include streets and roads, water systems, storm and sanitary sewer systems, parks and recreational facilities, and schools; while public services include law enforcement, fire protection, public health, and environmental protection services (RCW 36.70A.030). The goals further stipulate that public facilities and services adequate to serve additional development must be available at the time the additional development occurs (RCW 36.70A.020).

Counties that are required or choose to plan under the Growth Management Act must designate **urban growth areas**, areas within which urban growth will be encouraged and outside of which growth can occur only if it is non-urban in nature. Each city within such counties must be included in an urban growth area. An urban growth area may include lands that are located outside of a city if those lands are already characterized by urban growth, or are adjacent to lands already characterized by urban growth. The act finds that, in general, it is inappropriate to extend urban levels of public services to rural areas except in those limited circumstances where such extensions are necessary to protect public health, public safety, and the environment (RCW 36.70A.110).

Comprehensive plans prepared under the Growth Management Act must include a **rural element** that addresses lands that are not designated as urban growth area or agricultural, forest, or mineral lands. The rural element must include measures that are intended to protect the character of rural areas. Comprehensive plans must also include elements addressing land use, housing, capital facilities, and utilities (RCW 36.70A.070). In addition, the goals and policies of a county's or city's shoreline master program developed under the Shoreline Management Act of 1971 (Chapter 90.58 RCW) (see Section 3.5.5 below) are considered an element of the county's or city's comprehensive plan (RCW 36.70A.480).

The **land use element** designates the proposed distribution and location of various land uses and provides estimates of future population growth. The land use element must provide for protection of the quality and quantity of ground water used for public water supplies. Where applicable, the land use element must:

> . . . review drainage, flooding, and storm water run-off in the area and nearby jurisdictions and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute the waters of the state, including Puget Sound or waters entering Puget Sound (RCW 36.70A.070).

The **housing element** of a comprehensive plan is intended to ensure the vitality and character of established residential neighborhoods and to address future housing needs. The **capital facilities plan element** consists of:

- An inventory of existing publicly owned capital facilities such as water systems, sewer systems, stormwater facilities, schools, parks and recreational facilities, and law enforcement and fire protection facilities;
- A forecast of the future need for capital facilities;
- At least a six-year plan for financing needed capital facilities; and
- Provisions for reassessing the land use element if adequate funding is not available to provide needed capital facilities (Chapter 36.70A.070).

The **utilities element** must identify the location, proposed location, and capacity of all existing and proposed utilities including electrical, telecommunication, and gas utilities.

The Growth Management Act requires all counties and cities in the state, regardless of whether they are required or opt to plan under the act, to designate natural resource lands and critical areas within their jurisdiction. **Natural resource lands** include:

> . . . (a) Agricultural lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products;
>
> (b) Forest lands that are not already characterized by urban growth and that have long-term significance for the commercial production of timber; [and]
>
> (c) Mineral lands that are not already characterized by urban growth and that have long-term significance for the extraction of minerals . . . (RCW36.70A.170).

Critical areas as defined under the act include:

> . . . (a) **Wetlands**;
>
> (b) **Areas with critical recharging effect on aquifers used for potable water**;
>
> (c) **Fish and wildlife habitat conservation areas**;
>
> (d) **Frequently flooded areas**; and
>
> (e) **Geologically hazardous areas** (RCW 36.70A.030).

The Growth Management Act requires that all counties and cities to adopt **development regulations** to ensure conservation of natural resource lands and the protection of critical areas

(RCW 36.70A.060). The act stipulates that in designating critical areas and formulating development regulations for their protection, counties and cities are to use **best available science**. In addition, counties and cities must:

> . . . give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries (RCW 36.70A.172).

The provisions of a county's or city's shoreline master program developed under the Shoreline Management Act of 1971 (Chapter 90.58 RCW) (see Section 3.5.5 below), including use regulations, are considered part of the county's or city's development regulations.

The 2002 legislature amended the Growth Management Act to establish a schedule for counties and cities that plan under the act to review their comprehensive plans and development regulations to determine compliance with the provisions of the act and to amend their plans and/or development regulations as necessary. That schedule is as follows:

> . . . (a) On or before December 1, 2004, and every seven years thereafter, for Clallam, Clark, Jefferson, King, Kitsap, Pierce, Snohomish, Thurston, and Whatcom counties and the cities within those counties;
>
> (b) On or before December 1, 2005, and every seven years thereafter, for Cowlitz, Island, Lewis, Mason, San Juan, Skagit, and Skamania counties and the cities within those counties;
>
> (c) On or before December 1, 2006, and every seven years thereafter, for Benton, Chelan, Douglas, Grant, Kittitas, Spokane, and Yakima counties and the cities within those counties; and
>
> (d) On or before December 1, 2007, and every seven years thereafter, for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grays Harbor, Klickitat, Lincoln, Okanogan, Pacific, Pend Oreille, Stevens, Wahkiakum, Walla Walla, and Whitman counties and the cities within those counties (RCW 36.70A.130).

Counties and cities are required to provide notification of their intent to adopt or amend a comprehensive plan or development regulation to the Office of Community Development at least 60 days prior to final adoption. State agencies can provide comments to a county or city regarding a proposed comprehensive plan or development regulation during the public review process prior to adoption (RCW 36.70A.106).

3.5.5 Shoreline Management Act of 1971 (Chapter 90.58 RCW)

The Shoreline Management Act of 1971 (Chapter 90.58 RCW) establishes as policy of the state to:

> . . . provide for the management of shorelines of the state by planning for and fostering all reasonable and appropriate uses (RCW 90.58.020).

The primary policy objectives of the Shoreline Management Act are to:

- Protect against adverse effects to the public health, the land, its vegetation and wildlife and the waters of the state and their aquatic life;

- Plan for and foster all reasonable and appropriate uses of the shoreline; and

- Protect public rights of navigation and public access to the shoreline (RCW 90.58.020).

The Shoreline Management Act applies to the following classes of waters of the state, together with lands underlying them:

- All marine waters of the state;

- Streams and rivers with a mean annual flow of 20 cubic feet per second (cfs) or more;

- Lakes and reservoirs larger than 20 acres in area; and

- Wetlands associated with the above (RCW 90.58.030; RCW 90.58.040).

Shoreline jurisdiction applies to upland areas, referred to as **shorelands**, extending landward for 200 feet in all directions as measured on a horizontal plane from the “edge” of the waters of the state enumerated above (RCW 90.58.030; RCW 90.58.040). The “edge” of waters regulated under the Shoreline Management Act is referred to as the **ordinary high water mark**. The ordinary high water mark is determined by:

> . . . ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation . . . (RCW 90.58.030).

Shorelands also include floodways and contiguous 100-year floodplains landward for 200 feet from the floodways as well as deltas when such features are associated with the waters of the state enumerated above (RCW 90.58.030).

The Shoreline Management Act designates certain shorelines as **Shorelines of Statewide Significance**. These shorelines are defined in the act as:

- The Pacific Coast, Hood Canal, and certain Puget Sound shorelines;

- All waters of Puget Sound and the Strait of Juan de Fuca;

- Lakes or reservoirs with surface acreage of 1,000 acres or more;

- Any western Washington river downstream of a point where mean annual flow is 1,000 cubic feet per second;

- Any eastern Washington river downstream of a point where mean annual flow is 200 cubic feet per second, or any portion of a river downstream of the first 300 square miles of drainage basin, whichever is longer; and

- Wetlands associated with the above (RCW 90.58.030).

The Shoreline Management Act establishes preferences for uses of shorelines of the state and shorelines of statewide significance. These preferences are to be reflected in guidance developed by Ecology and in local shoreline master programs. For shorelines of the state, preference is given to uses that:

- Control pollution and prevent damage to the natural environment;

- Are unique to or dependent on proximity to shorelines; and

- Preserve or enhance public access (RCW 90.58.020).

For shorelines of statewide significance, preference is given to uses that:

- Recognize and protect statewide interests over local interests;

- Preserve the natural character of the shoreline;

- Result in long-term over short-term benefit;

- Protect resources and ecology of the shoreline; and

- Increase public access to publicly owned portions of shoreline (RCW 90.58.020).

The Shoreline Management Act establishes a balance of authority between local governments, the primary implementers of provisions of the act, and Ecology, which has authority to review local shoreline master programs and permit decisions (RCW 90.58.050; Ecology 1999). Counties and cities are required to prepare **Shoreline Master Programs** in accordance with provisions of the Shoreline Management Act and guidance developed by Ecology. Shoreline master programs consist of both planning and regulatory elements. The planning element provides a comprehensive vision of how shoreline areas will be used or developed. The regulatory element provides standards that shoreline projects and uses must meet (Ecology 1999).

Shoreline master programs must contain, when appropriate, the following elements:

- An economic development element for the location and design of industry, transportation facilities, port facilities, and tourist facilities;

- A public access element to make provisions for public access to publicly owned areas;

- A recreational element for the preservation and expansion of recreational opportunities;

- A circulation element addressing the location and nature of transportation routes related to shoreline areas;

- A use element that considers the distribution and location of land uses within shoreline areas;

- A conservation element for preservation of natural resources;

- A historic, cultural, scientific, and educational element for the protection and restoration of buildings, sites, and areas having historic, cultural, scientific, or educational values; and

- An element that gives consideration to the statewide interest in prevention and minimization of flood damages (RCW 90.58.100).

Each local government has established a system of permitting for shoreline development. A **substantial development permit** (SDP) is required for development that has a total cost or fair market value exceeding $5,000 and that is not specifically exempted under RCW 90.58.030(3)(e)). However, all development within shoreline jurisdiction must be consistent with the Shoreline Management Act and the local shoreline master program regardless of whether a shoreline permit is required. Examples of exempted activities include:

- Single family residences;

- Normal protective bulkheads for single family residences;

- Normal maintenance and repair of existing structures;

- Normal farming activities; and

- Emergency construction needed to protect property (Ecology 1999).

Uses classified either as a conditional use or unclassified require a shoreline **conditional use permit** (CUP). A shoreline **variance** is required for developments that do not comply with the bulk, dimensional and performance standards of the shoreline master programs. Conditional use permits and variances are intended to allow flexibility and give consideration to special circumstances. In addition to local approval, Ecology must approve all conditional use permits and variances (RCW 90.58.140).

The Shoreline Management Act exempts public and private projects that are designed to improve fish and wildlife habitat or fish passage from the requirement to obtain a substantial development permit, provided all of the following conditions are met:

- The project has been approved by the Department of Fish and Wildlife;

- The project has received hydraulic project (see Section 3.4.9.1) approval from the Department of Fish and Wildlife; and

- The local government has determined that the project is substantially consistent with the local shoreline master program (RCW 90.58.147).

In addition, watershed restoration projects that are part of a Watershed Restoration Plan developed under authority of Chapter 89.08 RCW (see Section 3.4.6) is similarly exempt (RCW 90.58.515).

3.5.6 Other Laws, Regulations, and Programs Affecting Land and Shoreline Use

Some additional selected laws, regulations, and programs related to land and shoreline use are summarized by subject in Table 3-5 below.

TABLE 3-5
Selected Additional Laws, Regulations, and Programs Relating to Land and Shoreline Use

Law, Regulation, Program	*Provisions/Effect*
Land Use Planning	
Procedural Criteria for Adopting Comprehensive Plans and Development Regulations (Chapter 365-195 WAC)	Chapter 365-195 WAC was developed and adopted by the state Office of Community Development under authority of the Growth Management Act (Chapter 36.70A RCW) to guide local governments in the development and adoption of comprehensive plans and critical area development regulations. This rule also provides guidance on how local governments include the "best available science" when they designate and protect critical areas (wetlands, fish and wildlife conservation areas, frequently flooded areas, critical aquifer recharge areas, and geologically unstable areas.) The rule also provides criteria for determining what constitutes the best available science.
Minimum Guidelines to Classify Agricultural, Forest, Mineral Lands and Critical Areas (Chapter 365-190 WAC)	Chapter 365-190 WAC was adopted by the state Office of Community Trade and Economic Development under authority of the Growth Management Act (Chapter 36.70A RCW) to assist local governments in classifying natural resource lands and critical areas. The guidelines contain specific criteria for delineating and designating wetlands, aquifer recharge areas, frequently flooded areas, and fish and wildlife habitat conservation areas and are to be used by local governments in formulating development regulations.

Law, Regulation, Program	*Provisions/Effect*
Local Project Review (Chapter 36.70B RCW)	Chapter 36.70B RCW was enacted by the Legislature to establish a mechanism for early determination of the consistency of proposed projects with comprehensive plans and development regulations adopted under authority of the Growth Management Act (Chapter 36.70A RCW). The integrated project review process established under this statute directs local governments to consider environmental analyses conducted in support of comprehensive plans and other planning documents as well as the mitigation measures that may be integral to existing laws and regulations when making threshold determinations under the State Environmental Policy Act (Chapter 43.21C RCW) and permit decisions.
Project Consistency (Chapter 365-197 WAC)	Chapter 365-197 WAC was adopted by the Office of Community Trade and Economic Development to provide criteria to assist local government planning under the Growth Management Act (Chapter 36.70A RCW) to analyze the consistency of project actions under four factors: 1) the type of land use allowed; 2) the level of development allowed, such as dwelling units per acre or other measures of intensity; 3) adequate infrastructure for the proposed project; and 4) characteristics of the proposed development and assessment for compliance with specific development regulations or standards.
Functional Plans and Related RCWs	
Sewerage, Water, and Drainage Systems (Chapter 36.94 RCW)	A sewerage and/or water general plan must incorporate the provisions of existing comprehensive plans (under the Growth Management Act, Chapter 36.70A RCW) relating to sewerage and water systems of cities, towns, municipalities, and private utilities to the extent they have been implemented. (See Section 3.3.4)
Comprehensive Plan – Local Improvement Districts (Chapter 57.16 RCW)	The statute requires, for the purpose of determining the present and reasonable foreseeable future needs, that the board of commissioners for a local improvement district shall examine, investigate, and select a water supply or water supplies for each district suitable and adequate for present and future needs, and shall consider and determine a general system or plan for acquiring such water supply or water supplies, and the lands, waters, and water rights and easements necessary.
State Building Code (Chapter RCW 19.27)	This statute states "each applicant for a building permit of a building necessitating potable water shall provide evidence of an adequate water supply for the intended use of the building."

Law, Regulation, Program	*Provisions/Effect*
Plats – Subdivisions -- Dedications (Chapter 58.17 RCW)	This statute provides the factors to be considered when approving or disapproving subdivisions. It states, "It [the legislative body] shall determine (a) if appropriate provisions are made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes…"
Shoreline Management	
Shoreline Management Act – Streams and Rivers Constituting Shorelines of the State (Chapter 173-18 WAC)	Chapter 173-18 WAC identifies, by county, specific segments of streams and rivers that constitute shorelines of the state and shorelines of statewide significance.
Shoreline Management Act – Lakes Constituting Shorelines of the State (Chapter 173-20 WAC)	Chapter 173-20 WAC identifies, by county, specific lakes and reservoirs that constitute shorelines of the state and shorelines of statewide significance.
Adoption of Designations of Shorelands and Wetlands Associated with Shorelines of the State (Chapter 173-22 WAC)	Chapter 173-22 WAC contains criteria used by Ecology in designating shoreland areas associated with shorelines of the state that are subject to the jurisdiction of the Shoreline Management Act (Chapter 90.58 RCW). The criteria address tidal waters, lakes, streams, and associated wetlands. Chapter 173-22 WAC also codifies shoreline designation maps developed by individual counties.
Shoreline Management Permit and Enforcement Procedures (Chapter 173-27 WAC)	Chapter 173-27 WAC was adopted by Ecology to provide for administration and enforcement of a permit system for shoreline management as authorized under the Shoreline Management Act (Chapter 90.58 RCW). Chapter 173-27 WAC sets forth review criteria and application and permit processes used by local governments and Ecology for review of substantial development permits, conditional use permits, and variances. It also provides detailed descriptions of developments that are exempt from substantial development permit requirements.

Law, Regulation, Program	*Provisions/Effect*
	Floodplain Management
Flood Plain [sic] Management (Chapter 86.16 RCW)	This act establishes the authority to the state to regulate navigable and non-navigable waters, subject to applicable federal laws, for purposes of managing floodplains and alleviating flood damage. Ecology is assigned responsibility for providing technical assistance to local governments in the development, administration, and enforcement of local floodplain management ordinances; establishing minimum state flood plain management requirements that are consistent with minimum requirements of the National Flood Insurance Program; and assisting local governments in identifying 100-year flood plains. The act also allows for local adoption of flood plain management ordinances, subject to approval by Ecology, that are in compliance with the requirements of the National Flood Insurance Program.
Flood Plain [sic] Management (Chapter 173-158 WAC)	Chapter 173-158 WAC represents the minimum state flood plain management requirements consistent with minimum requirements of the National Flood Insurance Program that Ecology is directed to establish under Chapter 86.16 RCW.

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CHAPTER 4
AFFECTED ENVIRONMENT

The environmental landscape of Washington State varies widely from region to region. A general description of portions of the existing natural and built environments within Washington State relevant to watershed planning follows.

4.1 EARTH

The far western portion of Washington State is part of the Coast Range region. The Coast Range consists of the Willapa Hills of southwest Washington and the Olympic Mountains, which extend north from the Chehalis River valley and form the Olympic Peninsula. The Puget Trough, a structural depression that extends the length of the state, lies to the east of the Coast Range. The Puget Trough is generally flat, but in places is characterized by hummocky glacial deposits. A substantial portion of the northern half of the trough is occupied by Puget Sound, a marine estuary of the Pacific Ocean.

East of the trough is the geologically complex Cascade Range. This range, which extends the entire length of the state, separates western Washington from eastern Washington. The most prominent geographic feature in the southeast portion of the state is the Columbia Plateau. The plateau is an extensive basin formed by numerous basalt flows. The Columbia and Snake Rivers flow through deeply incised trenches cut into the plateau largely as a result of the Missoula Floods that occurred during the last ice age. Portions of southeast Washington are occupied by fertile, windblown dust called loess.

The northeast portion of the state is occupied by several mountainous areas including the Okanogan Highlands, the Kettle River Range, and the Selkirk Mountains, a portion of the Rocky Mountain Range.

4.2 AIR

4.2.1 Washington Climate

Washington's climate varies dramatically from west to east with the western part of the state having a mild, humid climate and the eastern part a relatively cool and dry climate. The North Pacific Current offshore of western Washington and associated warm maritime air masses help to moderate the area's temperatures.

Western Washington has frequent cloud cover and considerable fog and rain. Portions of western Washington lying on the west side of the Olympic Mountains receive as much as 160 inches (400 centimeters) per year of precipitation, making that area the wettest in the 48 conterminous states. Precipitation in the Puget trough is much less, typically in the range of 40 to 50 inches (100 to 125 centimeters) per year with approximately 60-80 percent of that total falling in the six-month period between October and March. Areas of western Washington that experience the rain shadow effect of the Olympic Mountains have significantly less rainfall. For example, average annual precipitation for the City of Sequim is a scant 16 inches (40 centimeters).

Precipitation increases dramatically near the Cascade Mountains. Palmer, a site approximately 20 miles west of the Cascade crest, receives an annual average of 90 inches (225 centimeters) of precipitation. In an average year, Snoqualmie Pass, located at the Cascade crest, receives a water equivalent of 104 inches (260 centimeters) of precipitation, although much of that precipitation falls in the form of snow.

Temperatures in western Washington are moderate. Typical average maximum temperatures in July for western Washington are about 70 degrees (F) in coastal areas, and five to ten degrees warmer inland. Average minimum temperatures in July are generally in the low to mid-50s (F). Average maximum temperatures in January are in the mid-40s (F) with average minimum temperatures in the low 30s (F).

As previously noted, the climate of eastern Washington is dry. Many portions of eastern Washington receive less than 10 inches (25 centimeters) of total annual precipitation, and much of that precipitation falls in the form of snow. Total precipitation approaches 20 inches (50 centimeters) per year in areas closest to the Cascade Range and the Selkirk Mountains.

Temperature ranges in eastern Washington are more extreme than those of western Washington. Characteristic average maximum temperatures in July are in the mid-80s (F) to near 90 degrees (F). Average minimum temperatures in July are generally in the mid- to upper 50s (F). Average maximum temperatures in January are in the low to mid-30s (F), except in southeast Washington where the average maximum temperatures are closer to 40 degrees (F). Average minimum temperatures in January are typically in the teens to mid-20s (F).

4.2.2 Climate Variability

As is the case with the Pacific Northwest as a whole, the climate of Washington State exhibits considerable variability. The two principal factors affecting climate variability are the El Nino Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO).

ENSO involves a cyclical warming or cooling of sea surface temperatures in the equatorial Pacific Ocean to an extent significant enough to affect global weather patterns. ENSO episodes usually last six to 18 months and recur on a two to seven year cycle (JISAO/SMA Climate Impact Group 1999). The effects of ENSO are most pronounced during late fall and winter. ENSO has a warm phase, El Nino, and a cold phase, La Nina. In years in which El Nino is expressed, Northwest winters tend to be warmer and drier than average. During La Nina episodes, winters are typically cooler and wetter than average.

PDO involves cyclical changes in sea surface temperatures of the north Pacific Ocean. PDO has two phases: a warm phase and a cool phase. These phases generally alternate approximately every 20 to 30 years. Warm Phase PDO results from relatively warm sea surface temperatures in the north Pacific and influences Washington's climate towards a warm and dry pattern. The cool phase results from relatively cool sea surface temperatures in the north Pacific and has a cool and wet influence on the climate. The PDO phases have a more prolonged influence on Washington's climate than ENSO episodes. Generally, during warm phase PDO phases, snow depth, precipitation, and stream flows are below average, while higher than average snow depth, precipitation, and stream flows are experienced during cool phases (JISAO/SMA Climate Impact Group 1999).

4.2.3 Climate Change

A number of scientific assessments have concluded that the Earth's average temperature will likely increase during the 21st century (Hamlet et al. 2001). Climate models used in these assessments predict that both temperature and precipitation will significantly increase in the Pacific Northwest over the next 50 years. The potential consequences to water resources in the Pacific Northwest associated with warmer temperatures, greater precipitation, and a shift in winter precipitation type from snow to rain include reduced snow packs, higher winter stream flows and concomitant increased flood potential, earlier snowmelt generated peak flows, and lower summer flows (Hamlet et al., 2001). Similarly, rivers fed by glacial melt waters may be adversely affected by climate change. Pronounced reductions in the volume of and amount of area covered by glaciers can result in significant reductions in the amount of water released to downstream rivers (Environment Canada 2003).

4.3 SURFACE WATER

4.3.1 Freshwater - Rivers and Streams

The Columbia River, the largest river in the western United States, drains the eastern portion as well as part of the southwestern portion of Washington. Because of the large volume of water conveyed by the Columbia River and substantial elevation drops along its course, a number of hydroelectric dams have been constructed on the river, including 11 in Washington State. As such, many reaches of the Columbia are controlled pools or artificial lakes behind dams, such as Franklin D. Roosevelt Lake behind Grand Coulee Dam. The largest tributary of the Columbia, the Snake River, is also highly developed for hydroelectric power generation with four dams in operation within Washington State alone. Other major tributaries of the Columbia River in eastern Washington, listed from upstream to downstream, include the Pend Oreille, Kettle, Colville, Spokane, Sanpoil, Okanogan, Methow, Chelan, Entiat, Wenatchee, Yakima, Walla Walla, Klickitat, and White Salmon river systems. Washington tributaries of the Columbia River in the reach flowing from the Cascade Range Divide to the Pacific Ocean include the Wind, Washougal, Lewis, Kalama, Coweman, Cowlitz, Elochman, and Grays river systems.

A number of large western Washington river systems discharge to Puget Sound including, from north to south, the Nooksack, Skagit, Stillaguamish, Snohomish, Duwamish-Green, Puyallup, Nisqually, and Deschutes. Similarly, several river systems flow into the western arm of the Puget Sound estuary, Hood Canal, including the Quilcene, Dosewallips, Duckabush, Hamma Hamma, and Skokomish.

Rivers on the north end of the Coast Range region flow into the Strait of Juan de Fuca, which connects Puget Sound with the Pacific Ocean. These include the Dungeness, Elwah, Lyre, and

Hoko rivers systems. Rivers on the west side of the Coast Range region flow directly into the Pacific Ocean or embayments of the ocean such as Grays Harbor and Willapa Bay. These include the Soleduc, Hoh, Queets, Quinault, Humptulips, Chehalis, and Willapa river systems.

Flow in the states rivers is primarily determined by the amount and type of precipitation that falls during winter months. Precipitation that falls during the remainder of the year is typically returned to the atmosphere through evaporation and transpiration by plants. Flows in rivers whose headwaters are at relatively low elevations and that are located in areas where winter temperatures are above freezing for most of the winter and are dominated by rainfall patterns. They respond quickly and directly to rainfall events and generally have a strong winter peak in their annual flow pattern (hydrograph). The Chehalis River is an example of a river exhibiting this type of flow pattern.

Precipitation feeding rivers whose headwaters are at relatively high elevations and/or are located in areas where winter temperatures are below freezing for most of the winter falls predominantly in the form of snow. Generally, flows in such rivers are low during the winter, but peak strongly in spring and early summer corresponding to snowmelt within their watersheds. Most eastern Washington rivers, including the east-slope Cascade rivers, exhibit this flow pattern.

Rivers originating from the higher portions of the Olympic Mountains and the upper west-slopes of the Cascade Mountains have headwaters in areas where snowfall is the predominant form of winter precipitation, but temperatures are above freezing for most of the winter in the reaches below the headwaters. Flow patterns in such rivers typically show a winter peak associated with seasonal rainfall in the mid- and lower reaches as well as a spring or early summer peak associated with snowmelt in the upper reaches (Hamlet et al. 2001). However, rivers that are fed by glacial melt water, in addition to snow pack, will exhibit a different flow pattern. Glaciers can contribute a considerable amount of flow to rivers during late summer and early fall after the snow pack has melted and when precipitation is normally low.

4.3.2 Freshwater - Lakes

The state has numerous fresh water lakes, the largest of which is Lake Chelan, an approximately 55-mile long glacial lake in north central Washington. The state's lakes include naturally formed lakes, constructed reservoirs on rivers and streams, and natural lakes that are artificially raised and/or controlled through constructed impoundments. Lakes are typically fed by water from in-flowing rivers or creeks, but may also be fed by ground water and direct precipitation.

4.3.3 Marine Waters and Shorelines

The major marine water features of Washington State are comprised of the Pacific Ocean, the Strait of Juan de Fuca, and Puget Sound, including Hood Canal. Additional marine water features include several large coastal estuaries including Grays Harbor at the mouth of the Chehalis River, Willapa Bay at the mouth of the Willipa River, and the Columbia River estuary at the mouth of the Columbia River, as well as the straits and bays of the San Juan Archipelago. Fifteen counties have marine shorelines including Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and

Whatcom counties. Collectively, these counties share 2,337 miles of marine shoreline comprised of 157 miles of Pacific coastline, 144 miles of coast along the Straits of Juan de Fuca, 89 miles in Grays Harbor, 129 miles in Willipa Bay, 34 miles in the Columbia River Estuary, and 1,784 miles bordering Puget Sound and the Strait of Georgia. Approximately 73 percent of these shorelines consist of beaches, while 27 percent consist of rocky headlands, marshes, or other shoreline types (Ecology and NOAA 2001).

4.3.4 Surface Water Quality

In 1996, Ecology submitted a federal Clean Water Act section 303(d) list to the U.S. Environmental Protection Agency (EPA) identifying more than 600 surface waters that the department had determined to be out of compliance with water quality standards. The most common water quality problems noted were high temperature and low dissolved oxygen, which adversely affect aquatic life, and high fecal coliform levels, which represents a risk to public health (Ecology 1997).

Based on data collected by the Department of Ecology for the 2001 Water Quality Assessment, an update to the 2000 Clean Water Act Section 305(b) Report, about 48 percent of stream reaches monitored in the state were impaired for at least one beneficial use. The primary water quality problems were identified as high temperature, low dissolved oxygen, pH out of normal ranges, and high fecal coliform bacteria, mostly attributed to nonpoint pollution sources. The same assessment determined that about 37 percent of lakes monitored were impaired for at least one beneficial use. Excessive nutrients from nonpoint pollution were identified as the principal water quality problem. About 78 percent of estuaries monitored were determined to be impaired for at least one beneficial use. High temperature and low dissolved oxygen were identified as the primary causes of impairment; however, the majority of the water quality problems in estuaries were determined to have resulted from natural causes (Ecology 2002).

4.4 GROUND WATER

4.4.1 Ground Water Occurrence

The state defines ground water as:

> . . . all waters that exist beneath the land surface or beneath the bed of any stream, lake or reservoir, or other body of water within the boundaries of this state, whatever may be the geological formation or structure in which such water stands or flows, percolates or otherwise moves . . . (RCW 90.44.035).

There is a tendency for ground water to be thought as existing in underground lakes or rivers; however, what is referred to as ground water is underground water found in pore spaces between grains of soil or rock or within fractured rock formations (Ecology 1997). Ground water typically originates as precipitation that infiltrates the soil surface and percolates through soil and underlying unsaturated geologic materials to the water table. The water table represents the surface of a saturated zone, a zone in which all voids are filled with water. Water in a saturated zone is referred to as ground water. In cases where a saturated zone is capable of yielding water to a well, the saturated zone is referred to as an aquifer. Saturated zones comprised of coarse sands and gravels or those occupying large fractures in bedrock are generally the most productive aquifers. The process of infiltration and percolation of water to ground water described is known as aquifer recharge.

Surface water bodies and aquifers, particularly shallow aquifers, are often interconnected. Under such conditions, when water in a stream lies above the level of an aquifer, water tends to flow from the stream to the aquifer. Conversely, when water in an aquifer that is adjacent to a stream lies at a level higher than that of the stream, water tends to flows from the aquifer into the stream or "discharge" to the stream. Stream flow during low flow periods that is derived from ground water discharge is referred to as "baseflow." Baseflow is important in maintaining year-round flow in streams fed by runoff from rain and snowmelt (Hermanson 1991).

Aquifers occur as unconfined or confined. The condition described in which a saturated zone is separated from the ground surface by permeable soils and geologic materials is an unconfined aquifer, sometimes referred to as a "water table" aquifer. The water table surface represents the point at which water is at zero hydraulic pressure. Unconfined aquifers are typically shallow, and flow directions within them tend mimic the topography of the overlying land surface (Hermanson 1991).

A confined aquifer is separated from the ground surface and/or an overlying aquifer by a relatively impermeable, non-water bearing zone known as an aquitard. A confined aquifer often overlies other confined aquifers. Confined aquifers receive most of their recharge from areas where the aquitard is absent, or where there are cracks or gaps in the aquitard. Frequently, such recharge areas are in adjacent uplands. Water in a confined aquifer is unable to rise and fall freely because it is bound within its upper and lower confining layers. Thus, water in most confined aquifers is under pressure. When wells are drilled into confined aquifers, water levels in the well rise to a level above the top of the aquifer. Such wells are referred to as artesian. When pressure is sufficient to cause water in a well to rise above the surrounding ground surface, the well is referred to as flowing artesian. The level to which water in a confined aquifer will rise in a well forms an imaginary surface known as the potentiometric surface. The relationship of the potentiometric surface to a confined aquifer is similar to that of the water table to an unconfined aquifer (Hall and Dight 1987).

A potentiometric surface can fluctuate seasonally and from year-to-year due effects from variability in recharge amounts (seasonal precipitation, drought, etc.). However, where adequate water level monitoring data are available, the potentiometric surface of an aquifer surface can be mapped or modeled demonstrating contours, gradients, and flow direction.

4.4.2 Ground Water Occurrence in Washington State

Ground water aquifers are present throughout the state of Washington. The state's ground waters are used for a variety of purposes including drinking water, irrigation, stock watering, fish propagation, heating and cooling, industrial processes, and surface water augmentation.

Hermanson (1991) recognized a number of different types or classes of aquifers that are common within Washington. The Columbia River basalt aquifer occupies fractures in lava flows of the Columbia basin and beds of sand and gravel sandwiched between the flows. Because of variability in the nature of aquifer materials, yields from wells tapping this aquifer extend over a wide range; however some wells produce between 3,000 and 6,000 gallons per minute and are suitable for use by large irrigation systems and public water systems.

Glacial drift type aquifers are common in the northern parts of both western and eastern Washington as well as most of the Puget Sound basin and the Spokane Valley. These aquifers mainly occupy outwash deposits (meltwater sand and gravel deposits) left by advancing or receding glaciers. Wells completed in glacial drift aquifers typically produce less than 700 gallons per minute; however, some wells produce significantly higher yields. Water from wells completed in this aquifer is primarily used for public water supply and for single domestic purposes.

Valley-fill and alluvial types of aquifers occur in river valleys, river terraces, and deltas in various parts of the state. Well yields range from a few gallons per minute to several thousand gallons per minute. Water from wells completed in this aquifer is also primarily used for public water supply and for single domestic purposes.

4.4.2 Ground Water Quality

The Department of Ecology's 2001 Water Quality Assessment, an update to the 2000 Clean Water Act Section 305(b) Report, concluded that generally, ground water quality in Washington State is "good." However, the document noted that there are several areas of degraded ground water quality where beneficial uses have been adversely affected. The assessment attributed the ground water quality problems primarily to nitrates, pesticides, metals, and other types of nonpoint pollution. Nonpoint pollution is created by diffuse land and water use activities such as use of on-site sewage disposal systems, commercial and non-commercial use of pesticides and fertilizer, and management of stormwater runoff.

4.5 PLANTS

4.5.1 General Description

The flora of western Washington is dominated by coniferous forests. On the west side of the Olympic Mountains extending south to the Columbia River is a temperate rain forest consisting primarily of Sitka spruce, western red cedar, and western hemlock. The floor of the forest has a dense coverage of ferns and mosses. Further inland on the southern, eastern, and northern borders of the Olympic Mountains are more open forests dominated by Douglas fir, Sitka spruce, and western hemlock with a shrub understory.

The flora of the Puget Trough, extending to the western slopes of the Cascade Range, consists primarily of coniferous forests comprised of Douglas fir, western hemlock, and western red cedar with a shrub understory. Approaching the Cascade Range, the dominant tree species transition to a combination of Douglas fir, Grand Fir, and Pacific silver fir, and then to noble and subalpine fir.

The east slopes of the Cascade Range are covered by coniferous forests consisting of a mixture of Douglas fir, white pine, and in places western larch. This type of forest also occupies the northern border of the state extending to the Idaho border. In an easterly direction from the Cascade Range and in a southerly direction from the northern border, the forest quickly transitions to extensive ponderosa pine forests with sparse shrub understories. The central portion of eastern Washington, including the Columbia Plateau, is a shrub-steppe environment dominated by sagebrush and short grasses. The southeast portion of eastern Washington, the Palouse Hills, consists of a prairie occupied by tall grasses.

4.5.2 Riparian Habitat

Throughout the state, riparian habitat occurs in areas adjacent to rivers, streams, seeps, and springs. Because it typically occurs in narrow bands, riparian habitat occupies a relatively small percentage of the state's land area. However, because riparian habitat occurs as a transitional zone between aquatic and upland habitats, it serves as a critical component of the state's flora. Eighty-two species of fish may be found in Washington's freshwater bodies at some point in their life cycles (WDFW 1997). Suitable riparian habitat is essential to the maintenance of healthy fish populations.

Vegetation in riparian zones shades rivers and streams to help maintain relatively cool water temperatures needed by most fish. The roots of riparian vegetation stabilize stream banks, which serves to control or prevent erosion and sedimentation. Vegetation, litter layers, and soils in riparian zones help to filter-out sediments and pollutants preventing them from entering streams. Riparian vegetation also helps to reduce peak flood flows by storing and slowly releasing floodwaters (WDFW 1998).

Leaves, twigs, and insects contributed to rivers and streams by riparian habitat provide food and nutrients that are essential to fish and aquatic wildlife. Stream features such as pools, riffles, backwater, small dams, and off-channel habitat can be created by large trees that fall into streams from riparian zones. These features are needed by fish for cover, spawning, and protection from predators. Riparian vegetation can also provide overhanging cover for fish (WDFW 1998).

In addition to being critical for healthy fish populations, approximately 85 percent of the state's terrestrial (land) animals use riparian habitat for essential life activities. Forested riparian habitat offers an abundance of snags that provide shelter for cavity-nesting birds and mammals, and a food source for tree-clinging, insect eating birds. Amphibians, reptiles, and small mammals find shelter in or under downed trees and under dense vegetation. Large animals such as deer, elk, and moose can seek refuge from intense summer heat in relatively cool riparian zones (WDFW 1998).

4.5.3 Wetland Habitat

Wetlands are defined as:

> Those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Ecology 1996).

Washington State has a wide variety of wetlands, ranging from the estuarine salt marshes of Puget Sound and the Pacific Coast, riparian wetlands adjacent to rivers streams as an integral part of riparian habitat, potholes and vernal pools of eastern Washington, and high elevation meadows and fens. Many of the freshwater wetlands of western Washington are associated with ponds, lakes, rivers, and shorelines; however, a significant numbers of wetlands are "isolated" wetlands, wetlands that are not directly connected to other surface water bodies. Such wetlands depend on ground water discharge and precipitation for their hydrology. The climate of eastern Washington gives rise to a variety of permanent and intermittent wetlands that are typically very different from western Washington wetlands in their seasonality, chemistry, and plant species distribution (Ecology 1993).

Wetlands are capable of performing a number of functions, including many that are similar to those described for riparian areas, such as:

- Ground water recharge and discharge;
- Stormwater and floodwater detention;
- Water quality improvement;
- Erosion control and buffering;
- Food chain support; and
- Wildlife habitat and corridors (Ecology 1998).

Many of Washington's wetlands have been lost since the early 1900s due to various types of development activities (e.g., urban development, utility infrastructure construction, logging, and agriculture). Many of the remaining wetlands in the state have been degraded through alteration of hydrology, sedimentation, removal of vegetation (Ecology 1993).

4.6 FISH AND WILDLIFE

4.6.1 General Description

The wildlife of Washington State is quite diverse. This diversity of species inhabit an equally diverse variety of habitat types ranging from desert to rainforest in the terrestrial environment, and mountain spring to ocean in the aquatic environment. The variety of fish, amphibian, reptile, bird, mammal, mollusk, arthropod, and echinoderm life in Washington State prohibits an exhaustive listing of species and habitats. However, this document references the following categories of wildlife based on the Washington Department of Fish and Wildlife's Priority Habitat and Species (PHS) program. Examples of animals in each category are provided in parentheses.

Large mammals include priority species categories of big game ungulates (elk), terrestrial carnivores (fisher), and marine mammals (porpoise).

Small mammals include priority species categories of shrews (Merriam's shrew), bats (Big brown bat), rabbits (Black-tailed jack rabbit), and rodents (Gray-tailed vole).

Birds include the priority species categories of marine birds (pelican); herons (e.g. Black-crowned night heron); waterfowl (Aleutian Canada goose); hawks, falcons, eagles (Bald eagle); upland game birds (Blue grouse); cranes (Sandhill Crane); pigeons (Band-tailed pigeon); cuckoos (Yellow-billed cuckoo); owls (Burrowing owl); swifts (Vaux's swift); woodpeckers (Black-backed woodpecker); and perching birds (Loggerhead shrike).

Reptiles include the priority species categories of snakes (California mountain king snake), turtles (Western pond turtle), and lizards (Western skink).

Amphibians include the priority species categories of frogs (Columbia spotted frog) and salamanders (Cascades torrent salamander).

Fish include the priority species categories of lamprey (River lamprey); sturgeon (Green sturgeon); herring (Pacific herring); mudminnows (Olympic mudminnow); minnows (Lake chub); suckers (Mountain sucker); catfish (Channel catfish); smelt (Eulachon); trout, salmon, and whitefish (Bull trout); rockfish (Black rockfish); greenlings (lingcod); sculpins (Margined sculpin); sunfish (Largemouth bass); perches (Walleye); sand lances (Pacific sand lance); and right-eye flounder (English sole) (WDFW 1999). The list of fish enumerated above includes both native and non-native as well as freshwater and marine water species.

Fish habitat and fish recovery, especially for fish in the salmon family (salmonids), are critical components of most watershed planning efforts and will be addressed in more detail below. For purposes of this document, the term "salmonid" applies to trout, char, and salmon consistent with the Governor's *Statewide Strategy to Recovery Salmon – Extinction is not an Option* (WSJNRC 1999). There are two other groups of salmonids native to Washington waters, whitefish and grayling; however, they are not discussed further in this document. The following discussion is segregated into 1) salmonids and 2) other (non-salmonid) fish.

4.6.2 Salmonids

4.6.2.1 Resident Salmonids

Resident salmonids remain in freshwater habitat for their entire life cycle. All resident salmonids require clean, cool water to thrive. As will be noted below, some populations of resident salmonids in Washington State are declining. Such declines can be attributed to a number of factors including loss of suitable rearing habitat, water quality degradation, and loss of clean spawning gravels.

Resident salmonids typically feed on plankton, insects, other invertebrates, and smaller fish. Some of the most important and widespread native species of resident salmonids are rainbow trout, cutthroat trout, bull trout, and Dolly Varden. These species are discussed in more detail below. In addition to those species discussed below, there are a number of introduced (non-native) resident salmonid species in Washington's lakes and streams including golden trout, lake trout, and eastern brook trout.

***Rainbow Trout* –** Rainbow trout are widely distributed in Washington's lakes and streams and are the state's most popular game fish. Because of their popularity, natural populations are supplemented by Washington Department of Fish and Wildlife stocking programs that add over 17 million rainbow trout each year to the state's lakes and streams. Resident rainbow trout generally grow to a length of 18-24 inches. Rainbow trout include the sub-species of concern known as the red-band trout that is native to Washington State and other parts of the Columbia River basin.

***Cutthroat Trout* –** Resident coastal cutthroat trout are found in streams and ponds throughout much of western Washington. Although they may grow to a length of about 18 inches, in smaller bodies of water they may grow no larger than eight or nine inches. One group, or what is referred to as an "Evolutionary Significant Unit (ESU)," of coastal cutthroat trout, the Southwestern Washington/Columbia River ESU, has been proposed by U.S. Fish and Wildlife Service to be listed as a threatened species under the federal Endangered Species Act. West-slope cutthroat trout, another subspecies of cutthroat trout, are more common in eastern Washington lakes and streams and are planted by Washington Department of Fish and Wildlife in a number high-country lakes.

***Bull Trout* –** Although commonly called trout, bull trout are actually members of the char subgroup of the salmon family. Scientists distinguish char from other salmonids (trout and salmon) by the absence of teeth in the roof of the mouth and the presence of light colored spots on a dark background (trout and salmon have dark spots on a lighter background. Bull trout living in streams may grow to about four pounds while those living in lakes reach a weight of 20 pounds. Some bull trout live out their lives in areas near where they were hatched, while others migrate from streams to lakes, reservoirs, or salt water bodies a few weeks after emerging from their nests. While bull trout are known to live as long as twelve years, they reach sexual maturity between four and seven years of age. They spawn in gentle stream reaches with cold, unpolluted water and gravel and cobble substrate. Spawning occurs in the fall after stream temperatures have dropped to a satisfactory level.

Both the Coastal/Puget Sound and the Columbia River bull trout distinct population segments have been listed as threatened under the federal Endangered Species Act. The designated boundaries for these distinct population segments encompass the entire state of Washington; however, the U.S. Fish and Wildlife Service is still in the process of designating critical habitat (USFWS 1998; USFWS 2003). The U.S. Fish and Wildlife Service has proposed critical habitat for the Columbia River distinct population segment including portions of the Pend Oreille, Methow, Entiat, Wenatchee, Upper Yakima, Naches, Lower Yakima, Middle Snake, Walla Walla, Klickitat, Wind/White Salmon, and Lewis WRIAs (USFWS 2003). The critical habitat designation for the Columbia River distinct population segment is scheduled to take effect in October 2003. Critical habitat for the Puget Sound/Coastal distinct population segment is scheduled to be proposed in September 2003 (USFWS 2003a). In addition, Ecology has proposed amendments to the state's surface water quality standards (Chapter 173-201A WAC) that would designate specific waters of the state as native char habitat for purposes of applying a protective temperature water quality criterion (Ecology 2003).

Dolly Varden **–** As with bull trout, Dolly Varden are members of the char subgroup of the salmon family (salmonids). Dolly Varden are common in many rivers and some lakes in coastal areas of Washington. The Dolly Varden is similar in appearance to bull trout, but is generally smaller. Dolly Varden populations have generally been declining, and fishing for Dolly Varden has been restricted in a number of areas by Washington Department of Fish and Wildlife.

4.6.2.2 Anadromous Salmonids

Fish that hatch and rear in freshwater, spend a portion of their life in salt water, and then return to freshwater to spawn are referred to as anadromous species. Washington has seven native species of anadromous fish belonging to the genus Oncorhynchus. These species can collectively be called salmon and include: chinook, coho, chum, sockeye, and pink salmon; steelhead; and sea-run coastal cutthroat trout. In addition, Washington also has a native anadromous species belonging to the genus Salvelinus, bull trout.

Salmon habitat extends from the smallest inland streams to the Pacific Ocean, and is comprised of a vast network of freshwater, estuarine, and ocean habitats. Freshwater habitats are used by salmon for spawning, incubation, and juvenile rearing. In estuarine habitats, juvenile salmon experience rapid growth and make critical adjustments in the chemical balance of their body fluid as they transition between fresh and salt water. Salmon gain most of their adult body mass in ocean habitats before returning to rivers to spawn (WDFW 2000-2001).

Throughout their lives, salmon feed on a variety of freshwater and marine invertebrate organisms and fishes, while being fed upon by a variety of parasites, predators, and scavengers. Juvenile salmon feed on salmon carcasses, eggs, and invertebrates, including invertebrates that may have previously fed on salmon carcasses such as caddisflies, stoneflies, and midges. Thus, returning salmon provide a flow of nutrients into freshwater habitats and play a critical role in the ability of watersheds to retain overall productivity of salmon runs (WDFW 2000-2001).

Due to over-fishing, habitat loss, hatchery problems, and a changing ocean environment, salmon populations have declined significantly over the past several decades. Many salmon stocks in Washington State are now listed by National Oceanic and Atmospheric Administration (NOAA) Fisheries as either threatened or endangered under the federal Endangered Species Act (WDFW 2000-2001).

Chinook Salmon **–** Chinook salmon are the largest of all salmon. There are different seasonal "runs" or modes in the migration in the migration of chinook salmon from the ocean to freshwater. These runs are usually identified as spring, summer, fall, or winter based on when the adult salmon enter freshwater to begun their spawning migration. Freshwater entry and spawning are believed to be related to local water temperature and water flow regimes. An adult female chinook will prepare a spawning bed, called a redd, in a stream area with suitable gravel composition, water depth, and velocity. An adult female may deposit four to five "nesting pockets" within a single redd. Chinook salmon eggs will hatch 90 to 150 days after deposition and fertilization. Juvenile chinook may spend from three months to two years in freshwater before migrating to estuarine waters as smolts. After a period of rapid growth, they migrate to the ocean feed and mature. Chinook remain in the ocean for one to six years, most commonly two to four. Chinook salmon are the largest of the Pacific salmon, typically about 40 pounds; although those with long ocean residence time can sometimes grow to over 100 pounds.

A number of distinctive groups or what are termed "Evolutionary Significant Units" (ESUs) of chinook salmon are listed endangered or threatened under the federal Endangered Species Act including the Snake River Fall-run (threatened), Snake River Spring/Summer-run (threatened), Puget Sound (threatened), Lower Columbia River (threatened), and Upper-Columbia River Spring-run (endangered) ESUs (NOAA Fisheries 2000). In addition, the Snake River Fall-run, Snake River Spring/Summer-run, Puget Sound, Lower Columbia River, and Upper-Columbia River Spring-run of chinook salmon have been designated by the Washington Department of Fish and Wildlife as "State Candidate Species" (WDFW 1999).

Coho Salmon **–** Coho salmon spend approximately half their life cycle rearing in streams and tributaries. The long freshwater rearing period makes coho salmon more dependent on flow and freshwater habitat than salmonids with shorter freshwater rearing times. The remainder of their life cycle up to the point of returning to their stream of origin to spawn and die is spent foraging in estuarine and marine waters of the Pacific Ocean. Most adults return as three year olds; however, small number return after two. A mature coho is usually about two feet in length and weighs an average of about eight pounds.

Two distinctive groups or what are termed "Evolutionary Significant Units" (ESUs) of coho salmon are listed as a candidate species under the federal Endangered Species Act including the Puget Sound/Strait of Georgia and Lower Columbia River/Southwest Washington ESUs (NOAA Fisheries 2000a).

Chum Salmon **–** Chum salmon are large salmon, second only to chinook salmon in size. They spawn in the lower reaches of rivers and creeks, typically within 60 miles of the Pacific Ocean. They migrate almost immediately after hatching to estuarine and ocean habitats; thus, survival and growth of juvenile chum depends less on freshwater habitat conditions than on estuarine and marine habitat conditions. They usually arrive at their stream of origin from November to the end of December. Most chum salmon mature in between three to five years. The weight of a mature chum salmon is between 18 to 22 pounds.

Two distinctive groups or what are termed "Evolutionary Significant Units" (ESUs) of chum salmon are listed as threatened species under the federal Endangered Species Act including the Hood Canal Summer-run and Columbia River ESUs (NOAA Fisheries 2000b).

Sockeye Salmon – Sockeye salmon exhibit a variety of life history patterns that reflect varying dependency on freshwater environments. Most Sockeye salmon spawn in or near lakes where juveniles rear for one to three years before migrating to the ocean. For this reason, the major distribution and abundance of this salmon species is closely related to the location of rivers that have accessible lakes in their watersheds, such as the Wenatchee River (Lake Wenatchee) and Cedar River (Lake Washington).

There are also non-anadromous forms of sockeye salmon that spend their entire life in fresh water. Occasionally, a portion of the juveniles in an anadromous population will remain in their rearing lake environment throughout their lives and will eventually spawn together with their anadromous siblings. In Washington State, non-anadromous sockeye are referred to as kokanee.

One distinctive group or what is termed an "Evolutionary Significant Unit" (ESU) of sockeye salmon is listed as an endangered species under the federal Endangered Species Act, the Snake River ESU (NOAA Fisheries 2000c).

Pink Salmon – Pink salmon are the most abundant northwest salmon. They spawn in odd number years a short distance up coastal rivers. With only a two year life cycle, they tend to be small relative to other salmon, averaging three to four pounds and seldom reaching 10 pounds (WDFW 2001). There are no distinctive groups or what are termed an "Evolutionary Significant Units" (ESUs) of pink salmon is listed as a candidate, threatened, or endangered species under the federal Endangered Species Act.

Steelhead – Steelhead are sea-going rainbow trout. They begin their lives in freshwater rivers and creeks where they rear for two years before migrating to marine waters. Consequently, they are very dependent on flows and freshwater habitat. They reside in marine waters for one to six years (typically two to three years), then return to their home streams to spawn. Unlike salmon, which die after their spawning runs, adult steelhead can return to the sea and repeat the cycle. Adult steelhead typically range from 5 to 14 pounds; although, those with long ocean residence time may reach about 30 pounds.

Most steelhead spawn from mid-winter to late-spring; however, two distinct "runs" of steelhead return to freshwater at different times, a winter run and a summer run. Winter-run steelhead return to over 100 streams in Washington from November to the end of April. Washington Department of Fish and Wildlife plants hatchery winter run-steelhead in about 75 streams to enhance fish populations. Summer-run steelhead return to freshwater from April to the end of September in about 36 Washington rivers and creeks. Summer-run hatchery stocks are planted in approximately 45 rivers and creeks by the Washington Department of Fish and Wildlife (WDFW 2001).

Wild steelhead runs have been depleted in a number of river systems because of habitat loss and other problems (WDFW 2001). A number of distinctive groups or what are termed "Evolutionary Significant Units" (ESUs) of steelhead are listed endangered or threatened under the federal Endangered Species Act including the Middle Columbia River (threatened), Snake River Basin (threatened), Lower Columbia River (threatened), and Upper Columbia River (endangered) (NOAA Fisheries 2000d).

***Sea-Run Cutthroat Trout* –** Sea-run cutthroat trout are the anadromous population of the coastal cutthroat trout. Like steelhead, sea-run cutthroat trout rear for two years in freshwater before migrating and, thus, are very dependent on flow and freshwater habitat. They spawn in coastal, Puget Sound, and lower Columbia River tributary streams. The Southwestern Washington/Columbia River "Evolutionary Significant Unit" of coastal cutthroat trout has been proposed by the U.S. Fish and Wildlife Service to be listed as a threatened species under the federal Endangered Species Act.

Table 4-1 lists threatened or endangered salmon species for which critical habitat has been identified within individual WRIAs, or in the case of bull trout, where the Columbia River or Coastal/Puget Sound population segment may potentially occur.

***Bull Trout* –** As discussed in Section 4.6.2.1, some portions of bull trout populations will migrate from freshwater to marine waters after rearing and will return to freshwater to spawn. Those portions of bull trout populations are considered anadromous.

TABLE 4-1
ENDANGERED SPECIES ACT LISTED FISH SPECIES

WRIA	ESA LISTED FISH SPECIES
#1 Nooksack	- Puget Sound chinook (T) **
#2 San Juan	- Puget Sound chinook (T) **
#3 Lower Skagit	- Puget Sound chinook (T) **
#4 Upper Skagit	- Puget Sound chinook (T) **
#5 Stillaguamish	- Puget Sound chinook (T) **
#6 Island	**

(T) Threatened (E) Endangered

** The Coastal/Puget Sound and the Columbia River bull trout distinct population segments have been listed as threatened under the federal Endangered Species Act. The designated boundaries for these population segments encompass the entire state of Washington; however, the U.S. Fish and Wildlife Service is still in the process of designating critical habitat.

WRIA	ESA LISTED FISH SPECIES
#7 Snohomish	- Puget Sound chinook (T) **
#8 Cedar – Sammamish	- Puget Sound chinook (T) **
#9 Duwamish – Green	- Puget Sound chinook (T) **
#10 Puyallup – White	- Puget Sound chinook (T) **
#11 Nisqually	- Puget Sound chinook (T) **
#12 Chambers – Clover	- Puget Sound chinook (T) **
#13 Deschutes	- Puget Sound chinook (T) **
#14 Kennedy – Goldsborough	- Puget Sound chinook (T) **
#15 Kitsap	- Puget Sound chinook (T) **
#16 Skokomish – Dosewallips	- Puget Sound chinook (T) **
#17 Quilcene – Snow	- Puget Sound chinook (T) **
#18 Elwha – Dungeness	- Puget Sound chinook (T) **
#19 Lyre – Hoko	**
#20 Soleduc	- Sockeye (T) **
#21 Queets – Quinault	**
#22 Lower Chehalis	**
#23 Upper Chehalis	**
#24 Willapa	**
#25 Grays – Elochoman	- Columbia River chum (T) - Lower Columbia River chinook (T) **
#26 Cowlitz	- Columbia River chum (T) - Lower Columbia River chinook (T) - Lower Columbia River Steelhead (T) **

(T) Threatened (E) Endangered

** The Coastal/Puget Sound and the Columbia River bull trout distinct population segments have been listed as threatened under the federal Endangered Species Act. The designated boundaries for these population segments encompass the entire state of Washington; however, the U.S. Fish and Wildlife Service is still in the process of designating critical habitat.

WRIA	ESA LISTED FISH SPECIES
#27 Lewis	- Columbia River chum (T) - Lower Columbia River chinook (T) - Lower Columbia River Steelhead (T) **
#28 Salmon – Washougal	- Columbia River chum (T) - Lower Columbia River chinook (T) - Lower Columbia River Steelhead (T) **
#29 Wind – White Salmon	- Columbia River chum (T) - Lower Columbia River chinook (T) - Lower Columbia River Steelhead (T) **
#30 Klickitat	- Mid-Columbia River steelhead (T) **
#31 Rock – Glade	- Mid-Columbia River steelhead (T) **
#32 Walla Walla	- Mid-Columbia River steelhead (T) **
#33 Lower Snake	- Snake River chinook (T) - Snake River steelhead (T) **
#34 Palouse	**
#35 Middle Snake	- Snake River chinook (T) - Snake River steelhead (T) **
#36 Esquatzel Coulee	**
#37 Lower Yakima	- Mid-Columbia River steelhead (T) **
#38 Naches	- Mid-Columbia River steelhead (T) **
#39 Upper Yakima	- Mid-Columbia River steelhead (T) **
#40 Alkali – Squilchuck	**
#41 Lower Crab Creek	**
#42 Grand Coulee	**
#43 Upper Crab Creek	**
#44 Moses Coulee	**

(T) Threatened (E) Endangered

** The Coastal/Puget Sound and the Columbia River bull trout distinct population segments have been listed as threatened under the federal Endangered Species Act. The designated boundaries for these population segments encompass the entire state of Washington; however, the U.S. Fish and Wildlife Service is still in the process of designating critical habitat.

WRIA	ESA LISTED FISH SPECIES
#45 Wenatchee	- Upper Columbia River chinook (E) - Upper Columbia River steelhead (E) **
#46 Entiat	- Upper Columbia River chinook (E) - Upper Columbia River steelhead (E) **
#47 Chelan	**
#48 Methow	- Upper Columbia River chinook (E) - Upper Columbia River steelhead (E) **
#49 Okanogan	- Upper Columbia River chinook (E) - Upper Columbia River steelhead (E) **
#50 Foster	**
#51 Nespelum	**
#52 Sanpoil	**
#53 Lower Lake Roosevelt	**
#54 Lower Spokane	**
#55 Little Spokane	**
#56 Hangman	**
#57 Middle Spokane	**
#58 Middle Lake Roosevelt	**
#59 Colville	**
#60 Kettle	**
#61 Upper Lake Roosevelt	**
#62 – Pend Oreille	**

(T) Threatened (E) Endangered

** The Coastal/Puget Sound and the Columbia River bull trout distinct population segments have been listed as threatened under the federal Endangered Species Act. The designated boundaries for these population segments encompass the entire state of Washington; however, the U.S. Fish and Wildlife Service is still in the process of designating critical habitat.

Sources: http://www.nwr.noaa.gov (salmon and steelhead species); http://pacific.fws.gov (bull trout).

4.6.3 Other Fish

The discussion of "other fish" is comprised of two subsections: freshwater fish and marine water fish. It is recognized that some of the fish described below live at least a portion of their lives in estuaries or tidal affected portions of rivers that are transitional areas between freshwater and marine waters. In addition, native and non-native species, such as white sturgeon, eulachon, longfin smelt, Pacific lamprey, and American shad are anadromous.

4.6.3.1 Freshwater Species

Approximately 70 non-salmon fish species can be found in freshwater bodies of Washington State at some point in their life cycles. Of this number, over 30 species are introduced including some of the more popular sport fish such as: largemouth bass, smallmouth bass, walleye, crappie, yellow perch, catfish, tiger muskie, and bluegill sunfish. Native freshwater species include sturgeon, the largest freshwater fish species; a variety of minnows such as northern squawfish, redside shiner, leopard dace, and speckled dace; burbot (a member of the cod family); largescale sucker; Columbia River smelt (eulachon), and a number of sculpin species (WDFW 1997; WDFW 2001).

A number of the fish species identified above have been identified as State Candidate Species or Species of Concern by Washington Department of Fish and Wildlife for some Washington waters including the Leopard dace and Columbia River smelt.

4.6.3.2 Marine Species

A number of fish species are present in the marine waters of Washington State. The largest fish is the halibut, a flatfish that grows to more than 400 pounds in weight. Halibut is generally found in coastal waters. A number of other flatfish are present including starry flounder, sand sole, petrale sole, and Pacific sanddab. Lingcod is a relatively large fish species found in the Strait of Juan de Fuca and Puget Sound. Several different rockfish inhabit Washington's marine waters such as yelloweye rockfish, canary rockfish, blue rockfish, copper rockfish, and tiger rockfish. Additional marine fish include cabezon, a sculpin; Pacific cod, herring, walleye pollock; and striped sea perch. Blue sharks and spiny dog fish, both cartilaginous fish, are also present (WDFW 2001).

A number of fish species identified above have been identified as State Candidate Species or Species of Concern by the Department of Fish and Wildlife for some Washington waters including: pacific cod, most rockfish species, herring, and walleye pollock (WDFW 2001).

4.7 SCENIC RESOURCES AND AESTHETICS

As noted above in land use, the State of Washington hosts a wide variety of land uses. Parts of the state have been developed for urban and suburban land uses including combinations of residential, commercial, industrial, and institutional land uses and associated infrastructure such as roads, power facilities, water facilities, and wastewater treatment plants. Some rural portions of the state have been intensely developed for agriculture, forestry, and mineral extraction.

These areas may also have sporadic low density residential development. Other rural areas and natural areas are largely undeveloped, or developed almost exclusively for outdoor recreation. Most local governments have some form of land use plan and/or zoning code or ordinance that seeks to ensure that aesthetics are considered when permitting for development occurs.

The state's wide variety of natural settings and climate provides abundant scenic resources. Among these scenic resources are extensive coastal and estuarine waters and associated islands and beaches, and numerous mountain ranges, rivers, lakes, and wetlands. The Interagency Committee for Outdoor Recreation estimates that 50% of the approximately 587,000 people who partake in sightseeing activities each year in Washington State do so at scenic areas (Interagency Committee for Outdoor Recreation 2002).

4.8 LAND AND SHORELINE USE

Land use in Washington State is highly diverse. Portions of the Cascade Range and the Olympic Mountains are dedicated to federally owned wilderness areas, national parks, national recreation areas, and national forests. The national forests are managed for multiple uses including commercial timber production and recreation. Private forest lands are common in these mountainous areas as well as in the coast range and northeast Washington.

The lowlands of Puget Sound are heavily urbanized and include some of the state's largest cities such as Seattle, Tacoma, Everett, Bellingham, Bremerton, and Olympia. Areas around Spokane, Richland, Kennewick, Pasco, Yakima, and Wenatchee in eastern Washington are also characterized by urban levels of development. These urbanized areas are host to much of the state's population, as well as its manufacturing, commercial, and service industry base.

The state is also the site of extensive agricultural development. In western Washington, agricultural development is concentrated in the major river valleys, particularly those in the Puget Sound Region. Major portions of Eastern Washington have been developed for agricultural production. The Yakima, Wenatchee, and Okanogan River Valleys are host to large scale irrigated agriculture, as is the Columbia Basin in the central part of eastern Washington. Southeast Washington is extensively developed for dry-land farming of primarily wheat. Land use within the state's WRIAs is briefly characterized below in Table 3.

Counties and cities that have experienced significant growth over the last several decades are required to prepare comprehensive plans under the state's Growth Management Act (Chapter 36.70A RCW). That act requires affected cities and counties to designate their rural areas and urban growth areas and to conduct capital facilities planning to ensure that adequate public facilities are provided concurrent with future growth within designated urban growth areas. The Growth Management Act also requires all counties and cities to develop and adopt development regulations to protect critical areas such as wetlands, fish and wildlife habitat, and aquifer recharge areas. Development within shoreline areas is governed under shoreline master programs adopted pursuant to the state's Shorelines Management Act (Chapter 90.58 RCW). Local master programs, which must be approved by Ecology, are intended to protect shorelines from development and to require mitigation of impacts where appropriate.

TABLE 4-2
WATER RESOURCES INVENTORY AREAS
LAND USE

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#1 Nooksack	Whatcom (94%) Skagit (6%)	1,039,238	148,300	Bellingham, Ferndale, Lynden, Blaine, Everson,	Urban – 6% Agriculture – 10% Range – 3% Forest – 76% Other – 5%
#2 San Juan	San Juan (100%)	399,625	12,300	Friday Harbor	Urban – 2% Agriculture – 5% Range – 1% Forest – 53% Other – 39%
#3 Lower Skagit	Skagit (94%) Whatcom (4%) Snohomish (2%)	474,226	91,699	Mount Vernon, Anacortes, Sedro-Woolley, Burlington, La Conner	Urban – 9% Agriculture – 25% Range – 1% Forest – 65%
#4 Upper Skagit	Whatcom (39%) Skagit (38%) Snohomish (23%)	1,565,856	3,711	Darrington, Concrete	Urban – 1% Agriculture – 1% Range – 7% Forest – 92%
#5 Stillaguamish	Snohomish (73%) Skagit (27%)	459,938	16,955	Arlington, Stanwood, Granite Falls,	Urban – 3% Agriculture – 8% Range – 3% Forest – 86%
#6 Island	Island (100%)	332,471	68,900	Oak Harbor, Coupeville, Langley	Urban – 7% Agriculture – 6% Range – 1% Forest – 27% Other – 39%
#7 Snohomish	Snohomish (51%) King (49%)	1,221,817	290,747	Everett, Marysville, Mukilteo, Monroe, Lake Stevens	Urban – 6% Agriculture – 4% Range – 3% Forest – 83% Other – 4%
#8 Cedar – Sammamish	King (80%) Snohomish (20%)	442,791	1,216,924	Seattle, Bellevue, Kirkland, Renton, Redmond	Urban – 45% Agriculture – 1% Range – 1% Forest – 53%
#9 Duwamish – Green	King (100%)	372,463	478,508	Seattle, Federal Way, Kent, Renton, Auburn	Urban – 26% Agriculture – 7% Range – 1% Forest – 66%

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#10 Puyallup – White	Pierce (87%) King (13%)	674,272	449,059	Tacoma, Puyallup, Enumclaw, Bonney Lake, Sumner	Urban – 9% Agriculture – 10% Range – 3% Forest – 79%
#11 Nisqually	Pierce (58%) Lewis (25%) Thurston (17%)	492,954	9,975	Eatonville, Roy, Yelm, Dupont	Urban – 3% Agriculture – 7% Range – 4% Forest – 86%
#12 Chambers – Clover	Pierce (100%)	109,626	355,206	Tacoma, Lakewood, University Place, Fircrest, Steilacoom	Urban – 47% Agriculture – 3% Range – 2% Forest – 33% Other – 15%
#13 Deschutes	Thurston (90%) Lewis (10%)	189,721	179,184	Olympia, Lacey, Tumwater, Rainier	Urban – 17% Agriculture – 10% Range – 3% Forest – 70%
#14 Kennedy – Goldsborough	Mason (85%) Thurston (15%)	244,833	40,874	Shelton	Urban – 7% Agriculture – 1% Range – 1% Forest – 91%
#15 Kitsap	Kitsap (57%) Pierce (22%) Mason (13%) King (8%)	632,055	230,334	Bremerton, Port Orchard, Bainbridge Island, Poulsbo, Gig Harbor	Urban – 18% Agriculture – 2% Range – 2% Forest – 78%
#16 Skokomish – Dosewallips	Mason (59%) Jefferson (41%)	406,396	5,565	None	Urban – 1% Agriculture – 1% Range – 1% Forest – 82% Other – 15%
#17 Quilcene – Snow	Jefferson (86%) Clallam (14%)	401,002	23,801	Port Townsend	Urban – 3% Agriculture – 22% Range – 1% Forest – 57% Other – 17%
#18 Elwha – Dungeness	Clallam (82%) Jefferson (18%)	650,549	179,184	Port Angeles Sequim	Urban – 2% Agriculture – 14% Range – 1% Forest – 68% Other – 15%
#19 Lyre – Hoko	Clallam (100%)	494,359	2,156	Neah Bay	Urban – 1% Agriculture – 2% Range – 2% Forest – 47% Other – 48%

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#20 Soleduc	Clallam (65%) Jefferson (35%)	770,178	6,719	Forks	Urban – 1% Agriculture – 1% Range – 1% Forest – 92% Other – 5%
#21 Queets – Quinault	Jefferson (56%) Grays Harbor (43%) Mason (<1%)	749,709	1,284	Taholah	Urban – 2% Agriculture – 1% Range – 1% Forest – 96%
#22 Lower Chehalis	Grays Harbor (84%) Mason (15%) Jefferson (<1%) Pacific (<1%) Thurston (<1%)	907,637	65,333	Aberdeen Hoquiam Montesano Elma Ocean Shores	Urban – 5% Agriculture – 2% Range – 1% Forest – 92%
#23 Upper Chehalis	Lewis (60%) Thurston (24%) Grays Harbor (11%) Pacific (4%) Cowlitz (1%)	827,515	40,830	Centralia Chehalis Tenino Napavine Bucoda	Urban – 2% Agriculture – 13% Range – 1% Forest – 83%
#24 Willapa	Pacific (83%) Grays Harbor (16%) Lewis (<1%) Wahkiakum (<1%)	734,106	20,800	Raymond South Bend Long Beach Ilwaco	Urban – 2% Agriculture – 2% Range – 1% Forest – 78% Other – 17%
#25 Grays – Elochoman	Wahkiakum (56%) Cowlitz (26%) Pacific (17%) Lewis (1%)	322,582	61,659	Longview Cathlamet	Urban – 4% Agriculture – 4% Range – 1% Forest – 83% Other – 8%
#26 Cowlitz	Lewis (57%) Cowlitz (27%) Skamania (13%) Pierce (2%) Yakima (1%)	1,597,566	34,882	Kelso Castle Rock Morton Winlock Toledo	Urban – 2% Agriculture – 4% Range – 2% Forest – 89% Other – 3%
#27 Lewis	Skamania (49%) Cowlitz (26%) Clark (25%)	837,431	18,831	Woodland Ridgefield Kalama Yacolt	Urban – 3% Agriculture – 3% Range – 1% Forest – 90% Other – 3%
#28 Salmon – Washougal	Clark (67%) Skamania (33%)	316,365	282,278	Vancouver Camas Washougal Battle Ground Ridgefield	Urban – 23% Agriculture – 14% Range – 3% Forest – 53% Other – 7%
#29 Wind/ White Salmon	Skamania (65%) Klickitat (31%) Yakima (4%)	576,745	14,528	White Salmon Stevenson	Urban – 1% Agriculture – 1% Range – 2% Forest – 93% Other – 3%
#30 Klickitat	Klickitat (58%) Yakima (42%)	918,850	10,267	Goldendale	Urban – 1% Agriculture – 13% Range – 9% Forest – 77%

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#31 Rock – Glade	Benton (50%) Klickitat (44%) Yakima (6%)	1,057,998	64,521	Kennewick	Urban – 1% Agriculture – 49% Range – 37% Forest – 9% Other – 4%
#32 Walla Walla	Walla Walla (72%) Columbia (28%)	908,812	56,455	Walla Walla College Place Dayton Waitsburg	Urban – 2% Agriculture – 73% Range – 4% Forest – 15% Other – 6%
#33 Lower Snake	Franklin (57%) Walla Walla (39%) Columbia (4%)	461,472	Not Available	None	Urban – 1% Agriculture – 66% Range – 32% Forest – 1%
#34 Palouse	Whitman (62%) Adams (20%) Spokane (13%) Lincoln (4%) Franklin (1%)	1,765,345	47,238	Pullman Medical Lake Colfax Palouse Rosalia	Urban – 1% Agriculture – 67% Range – 26% Forest – 6%
#35 Middle Snake	Garfield (32%) Asotin (28%) Columbia (20%) Whitman (20%)	1,440,130	21,744	Clarkston Pomeroy Asotin Starbuck	Urban – 1% Agriculture – 41% Range – 36% Forest – 22%
#36 Esquatzel Coulee	Franklin (50%) Adams (33%) Grant (17%)	1,058,960	58,290	Pasco Othello Connell Mattawa Mesa	Urban – 1% Agriculture – 68% Range – 30% Forest – 1%
#37 Lower Yakima	Yakima (74%) Benton (24%) Klickitat (2%)	1,862,225	257,429	Yakima Richland Sunnyside Grandview Toppenish	Urban – 2% Agriculture – 30% Range – 53% Forest – 15%
#38 Naches	Yakima (90%) Kittitas (10%)	709,990	3,006	Yakima Tieton Naches	Urban – 2% Agriculture – 5% Range – 12% Forest – 81%
#39 Upper Yakima	Kittitas (85%) Yakima (15%)	1,366,935	39,216	Ellensburg Selah Cle Elum Roslyn Kittitas	Urban – 3% Agriculture – 11% Range – 31% Forest – 54%
#40 Alkali – Squilchuck	Kittitas (48%) Benton (29%) Chelan (14%) Yakima (9%)	541,356	514	Richland	Urban – 2% Agriculture – 5% Range – 80% Forest – 12%
#41 Lower Crab Creek	Grant (66%) Adams (32%) Lincoln (2%)	1,622,130	56,435	Moses Lake Ephrata Othello Quincy Ritzville	Urban – 3% Agriculture – 69% Range – 27% Forest – 1%

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#42 Grand Coulee	Grant (83%) Douglas (14%) Lincoln (3%)	482,825	8,384	Ephrata Soap Lake Grand Coulee Electric City Coulee City	Urban – 1% Agriculture – 45% Range – 50% Forest – 4%
#43 Upper Crab Creek	Lincoln (88%) Grant (8%) Spokane (2%) Adams (2%)	1,185,282	6,043	Medical Lake Odessa Wilbur Reardan Harrington	Urban – 1% Agriculture – 62% Range – 35% Forest – 2%
#44 Moses Coulee	Douglas (93%) Grant (7%)	730,029	21,897	East Wenatchee Waterville Rock Island	Urban – 1% Agriculture – 61% Range – 35% Forest – 3%
#45 Wenatchee	Chelan (100%)	877,392	53,055	Wenatchee Cashmere Leavenworth	Urban – 1% Agriculture – 2% Range – 7% Forest – 85% Other – 5%
#46 Entiat	Chelan (100%)	305,529	1,108	Entiat	Urban – 1% Agriculture – 1% Range – 6% Forest – 89% Other – 3%
#47 Chelan	Chelan (98%) Okanogan (2%)	670,111	5,927	Chelan	Urban – 1% Agriculture – 3% Range – 6% Forest – 78% Other – 11%
#48 Methow	Okanogan (100%)	1,357,656	4,608	Twisp Pateros Winthrop	Urban – 1% Agriculture – 1% Range – 10% Forest – 84% Other – 4%
#49 Okanogan	Okanogan (100%)	1,344,550	28,855	Omak Okanogan Brewster Oroville	Urban – 1% Agriculture – 8% Range – 37% Forest – 52% Other – 2%
#50 Foster	Douglas (74%) Okanogan (26%)	578,182	7,703	Bridgeport Mansfield	Urban – 1% Agriculture – 39% Range – 53% Forest – 7%
#51 Nespelum	Okanogan (85%) Ferry (15%)	144,643	524	Nespelem	Urban – 1% Agriculture – 8% Range – 10% Forest – 76% Other – 5%
#52 Sanpoil	Ferry (67%) Okanogan (33%)	628,128	3,904	Republic	Urban – 1% Agriculture – 1% Range – 7% Forest – 91%

WRIA	COUNTIES (% of total acres)	ACREAGE	POP. (approx.)	PRINCIPAL CITIES	LAND USE (% of total acres)
#53 Lower Lake Roosevelt	Lincoln (63%) Ferry (23%) Okanogan (14%) Grant (<1%)	326,198	6,348	Davenport Coulee Dam Elmer City	Urban – 1% Agriculture – 26% Range – 38% Forest – 31% Other – 4%
#54 Lower Spokane	Stevens (49%) Spokane (28%) Lincoln (23%)	568,799	41,670	Spokane Medical Lake Airway Heights	Urban – 3% Agriculture – 29% Range – 5% Forest – 62% Other – 1%
#55 Little Spokane	Spokane (62%) Pend Oreille (25%) Stevens (13%)	431,826	113,575	Deer Park	Urban – 5% Agriculture – 26% Range – 3% Forest – 66%
#56 Hangman	Spokane (95%) Whitman (5%)	289,833	56,035	Spokane Cheney Tekoa Rockford Fairfield	Urban – 5% Agriculture – 64% Range – 1% Forest – 30%
#57 Middle Spokane	Spokane (93%) Pend Oreille (7%)	183,274	180,526	Spokane Millwood	Urban – 23% Agriculture – 16% Range – 4% Forest – 57%
#58 Middle Lake Roosevelt	Ferry (72%) Stevens (28%)	702,800	2,113	None	Urban – 1% Agriculture – 6% Range – 8% Forest – 81% Other – 4%
#59 Colville	Stevens (99%) Pend Oreille (1%)	650,482	31,668	Colville Chewelah Kettle Falls Springdale	Urban – 1% Agriculture – 13% Range – 2% Forest – 84%
#60 Kettle	Ferry (66%) Okanogan (24%) Stevens (10%)	654,844	2,804	None	Urban – 1% Agriculture – 3% Range – 13% Forest – 83%
#61 Upper Lake Roosevelt	Stevens (94%) Pend Oreille (6%)	370,061	2,012	Kettle Falls Northport Marcus	Urban – 1% Agriculture – 4% Range – 3% Forest – 89% Other – 3%
#62 Pend Oreille	Pend Oreille (97%) Stevens (3%)	794,546	10,700	Newport Ione Metaline Falls Metaline Cusick	Urban – 1% Agriculture – 4% Range – 2% Forest – 93%

Adapted from: *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution, Appendix A*, Washington State Department of Ecology Publication # 99-26, January 2000.

4.9 CULTURAL RESOURCES

Cultural resources consist of archeological, historic, and traditional cultural places including buildings, structures, sites, districts, objects, and landscapes. The State Office of Archeology and Historic Preservation has records of over 20,000 archeological and traditional cultural places and over 100,000 historic properties within the state. This information is maintained in the Washington State Inventory of Cultural Resources (OAHP 2002).

Under the State Environmental Policy Act, potential significant adverse impacts to historic, archeological, and traditional cultural places associated with project actions must be identified and evaluated. The Office of Archeology and Historic Preservation is the agency responsible for providing formal opinions to local governments and other state agencies on a site or property's significance and the potential impact of a proposed project action upon such sites or properties. Similarly, the National Historic Preservation Act requires that all federal agencies consider cultural resources as part of all licensing, permitting, and funding decisions (OCD 2002).

While legally not considered historic, archeological, and traditional cultural places, many of the state's rivers and other surface water bodies have cultural significance to some population groups, including many Native American tribes. Rivers and their tributaries can be viewed as being analogous to the bloodstream of a watershed and have great importance on both a practical and spiritual level.

4.10 RECREATION

Waters of the State of Washington are used extensively for recreation. Citizens of the state, as well as visitors to the state, enjoy sightseeing, aquatic waterfowl watching, hunting, fishing, and other water oriented activities. Water activities include a variety of different pursuits including swimming or wading, motor boating, water skiing, personal water craft use (e.g., jet skis), sail boating, hand power boating (kayaking, canoeing, or rowing), white water rafting, inner tubing, wind surfing, surfboarding, scuba diving, and beachcombing.

In many cases, the types of recreational opportunities afforded are determined by the nature of the water body. For example, white water rafting requires free flowing rivers with adequate flows to create whitewater conditions. Conversely, lakes and reservoirs are generally more conducive to power boating and wind surfing than free flowing streams. If the character of a water body is changed through flow alterations, such as construction of a dam, associated recreational opportunities may change as well. Similarly, if the quality of water in a lake or stream changes, it may alter the use of the water body for recreation. For example, bacterial or chemical contamination in a water body may make it unsuitable for swimming or fishing. An increase in water temperature in a lake may alter fish populations, potentially reducing the numbers or eliminating cold water fish species (e.g., some types of trout) and creating conditions more conducive for warm water fish species (e.g., bass).

4.11 TRANSPORTATION

The public highway and road network in Washington State is comprised of approximately 81,300 miles (130,840 kilometers) of federal, state, and local roads. Included in that number are 757 miles (1,218 kilometers) of interstate highways (Access Washington 1998-2002). The largest interstate highways are Interstate-5, which traverses western Washington from north to south from the Canadian border near Vancouver to the Columbia River near Portland, and Interstate-90, which traverses much of the state from west to east from Seattle to the Idaho border. The interstate and state highway system is managed by the Washington State Department of Transportation. Other public road systems are managed by county and municipal governments.

Washington State is served by a number of private railroads, including two large Class I railroads: the Burlington Northern Santa Fe Railway and the Union Pacific Railroad. In total, there are about 3,470 miles (5,585 kilometers) of Class I railroad track in Washington (Access Washington 1998-2002).

Washington has a number of large ports that are important hubs for transpacific shipping including Seattle and Tacoma on Puget Sound as well as Kalama and Longview on the Columbia River. The Columbia River and Snake River are conduits for barge traffic.

4.12 PUBLIC SERVICES AND UTILITIES

The existing framework for public services and utilities related to watershed planning under Chapter 90.82 RCW is described in Chapter 3.0.

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CHAPTER 5.0
ALTERNATIVES

The State Environmental Policy Act (SEPA) requires that an environmental impact statement (EIS) identify and discuss "reasonable" alternatives to a proposal. Alternatives discussed need not be exhaustive, but must present sufficient information for a reasoned choice of alternatives. The word "reasonable" is intended to limit the number and range of alternatives, as well as the level of detailed analysis for each alternative. Reasonable alternatives include actions that feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation (WAC 197-11-440).

For nonproject proposals, SEPA does not require that an EIS identify and examine all conceivable implementation measures for a plan, but it should cover a range of such topics. Additionally, alternatives and impacts should be discussed at a level of detail appropriate to the scope of the nonproject proposal and to the level of planning for the proposal (WAC 197-11-442).

This chapter describes the manner in which the watershed planning alternatives evaluated as part of this document were developed, and describes the alternatives for each of the four components of watershed planning under Chapter 90.82 RCW: water quantity, instream flow, water quality, and habitat. The alternatives presented for each component includes a "no action alternative" to allow comparison of the impacts associated with inaction with the impacts of various action alternatives.

The alternatives presented below represent the types of recommended actions that planning units may include in their watershed plans to achieve the objectives of Chapter 90.82 RCW and the objectives of their individual watershed plans. The alternatives reflect input received from planning units, lead agencies, and Department of Ecology (Ecology) watershed leads concerning the types of recommended actions that are being considered as part of their planning processes. However, the alternatives discussed below do not represent all recommended actions that could conceivably be proposed a by planning unit. Decisions concerning what specific alternatives will be included in any individual watershed plan will be made by local watershed planning units within the framework established under Chapter 90.82 RCW.

Planning conducted under Chapter 90.82 RCW provides a process to allow the local citizens within a Water Resource Inventory Area (WRIA) or a multi-WRIA planning area to join together in an effort to assess the status of the water resources of their management area and to determine how best to manage those resources. As such, there is likely to be considerable variability from WRIA to WRIA regarding the management strategies employed and recommended actions proposed to meet the objectives of a specific watershed plan. Therefore, this document includes consideration of a relatively wide range of alternatives for addressing each of the four watershed plan components. Similarly, the nature of rules developed by Ecology and, potentially, other state agencies in response to adopted watershed plans could vary from narrowly focused rules addressing a single implementation action to general obligation rules addressing a wide range of implementation actions.

Since this is a statewide, nonproject environmental impact statement, the alternatives are generic in nature and do not address site-specific activities. Additionally, the alternatives are generally not mutually exclusive. Multiple recommended actions can be proposed for a planning component to address watershed planning objectives for a WRIA.

5.1 WATERSHED ENVIRONMENTAL IMPACT STATEMENT ALTERNATIVES DEVELOPMENT PROCESS

The alternatives included in this document were developed based on input from local lead agencies, planning units, and Ecology watershed leads. Early in the environmental impact statement (EIS) process, questionnaires were distributed to planning units through 14 Ecology watershed leads representing, at that time, 32 watershed planning efforts in 41 WRIAs. The questionnaires were intended to solicit information from planning units regarding recommended actions that they were considering in their planning processes. Information generated through this process would be available for use in both the Watershed Planning EIS and Phase 4 implementation planning. The purpose of distributing the questionnaire through the Ecology watershed leads was to allow them an opportunity to provide background information to the Planning units concerning the statewide Watershed Planning EIS, as well as to explain the purpose of the questionnaire.

Six Planning units provided written responses to the questionnaires. This information was supplemented by interviews of five watershed leads representing an additional nine watershed planning efforts. A number of the watershed leads and lead agencies that did not provide responses to the questionnaire indicated that their planning efforts had not advanced to the point where actions that would likely be included in their watershed plan could be identified. Others indicated that while there had been some initial deliberation concerning actions that might be included in their watershed plans, they considered the identified actions too tentative or preliminary to identify as probable elements of their plans.

5.2 WATER QUANTITY ALTERNATIVES

Chapter 90.82 RCW identifies a number of strategies that must be considered in addressing water quantity issues in a WRIA or multi-WRIA planning area including:

- Water conservation;
- Water reuse;
- Use of reclaimed water;
- Voluntary water transfers;
- Aquifer recharge and recovery;
- Additional water allocations; or

- Additional water storage or water storage enhancements.

These strategies were considered in addition to input from planning units, lead agencies, and Ecology watershed leads in identifying water quantity alternatives for the watershed planning environmental impact statement. The identified alternatives fall within the following three general categories of potential recommended actions:

- Promote water use efficiency;

- Effectively manage allocation and use of water resources through legal mechanisms; and

- Develop or improve water resources storage infrastructure.

Descriptions of the water quantity alternatives are provided below, along with that for a water quantity "no action alternative." The environmental impacts and potential mitigation measures associated with these alternatives are discussed in Chapter 6.

5.2.1 Promote Water Use Efficiency

Alternative WP 1. Develop and implement municipal conservation programs including demand management and operational efficiency measures.

> Demand management measures are intended to induce the water consumer to conserve through such measures as education, implementation of rate structures that discourage excessive use of water, or adoption of local landscaping ordinances. Public water systems are already involved in efforts to educate consumers concerning the need for water conservation and means by which conservation can be accomplished (for example, encouraging use of high-efficiency plumbing fixtures in the home or native vegetation in landscaping).
>
> Operational efficiency measures include activities undertaken by public water systems to conserve water such as minimizing losses of water during routine flushing of mains, detecting and repairing leaks, and testing and repairing meters.

Alternative WP 2. Develop and implement agricultural water conservation and irrigation efficiency efforts through regional or irrigation district infrastructure improvements.

> Irrigation districts are responsible for delivering water to farmers and other agricultural producers for use in irrigating their land. As such, irrigation districts operate extensive regional conveyance systems. A number of types of conservation measures may be implemented for such systems including:

- Lining canals to prevent water losses through infiltration;

- Replacing canals and ditches with closed pipe systems;

- Installing pump-back stations to capture tail water for reuse;
- Implementing canal automation and constructing re-regulation reservoirs to optimize water use; and
- Improving water measurement and accounting systems (EES, 2001).

Alternative WP 3. Develop and implement on-farm agricultural water conservation and irrigation efficiency efforts.

On-farm agricultural water conservation and irrigation efficiency measures would typically be implemented by individual landowners, often with technical assistance from the local conservation district or the Natural Resources Conservation Service. Such measures could include:

- Replacing open laterals and trenches with closed pipe systems;
- Replacement of non-pressurized irrigation systems with pressurized sprinkler systems or drip irrigation systems;
- Use of soil moisture sensors to prevent over-watering; and
- Construction of on-farm ponds to capture and reuse tailwater (EES, 2001).

Alternative WP 4. Develop and implement industrial conservation measures.

Some industrial operations consume significant amounts of water for their operational activities. Examples of such operations are food processing plants, power generating plants, and pulp and paper mills. Opportunities for industrial conservation could include modification to the following types of practices: heating and cooling, product washing and processing, cleaning and maintenance, wastewater disposal, and landscaping.

Alternative WP 5. Request local governments or sewer utilities to construct and operate water reclamation and reuse facilities (for example, reclamation plants and use areas) to provide water for beneficial uses.

"Reclaimed water" is defined as "effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur and is no longer considered wastewater" (RCW 90.46.010(4)). Reclaimed water can be used for industrial and commercial uses, in land application (for example, irrigation), direct recharge of ground water, surface percolation and indirect recharge of ground water, discharge to wetlands, direct stream flow augmentation, and indirect stream flow augmentation through ground water recharge. The purpose of this alternative is to reduce the consumption of potable water for those uses for which reclaimed water would be suitable. Thus, the conserved potable water would become available for other beneficial uses. Reclamation is also a means of reducing discharges of wastewater to receiving waters (See also Alternative WP28).

Alternative WP 6. Promote greywater segregation and use in accordance with Department of Health standards.

Wastewater segregation involves the in-house separation of the domestic sewage stream into two fractions: toilet wastes and kitchen sink wastes, referred to as blackwater; and dishwasher, clothes washer, and bath/shower wastes, referred to as greywater (Sherman, 1991). In recent years, use of treated greywater for landscaping irrigation and recycling of greywater for toilet flushing has been recognized as a means of conserving potable water supplies. Treatment of greywater is achieved through the installation and operation of a specialized on-site sewage system. Disposal of blackwater must be accomplished through use of composting or incinerating toilets, an on-site sewage system, or discharge to a central sewer system.

5.2.2 Effectively Manage Allocation and Use of Water Resources Through Legal Mechanisms

Alternative WP 7. Request Ecology to transfer existing water rights for out-of-stream beneficial uses acquired through purchase, lease, voluntary methods, or condemnation to other out-of-stream beneficial uses.

Under this alternative, a watershed plan would request that Ecology, through the mechanisms identified above, transfer water from a less beneficial out-of-stream use or uses to a more beneficial out-of-stream use or uses as determined based on the goals and objectives of the watershed plan.

Alternative WP 8. Request Ecology to transfer existing water rights for out-of-stream beneficial uses acquired through purchase, lease, voluntary methods, or condemnation to instream beneficial uses through the state's Trust Water Right Program.

Changes of an out-of-stream use to an instream use involve the state's Trust Water Rights Program. Trust water rights may be held by Ecology or "authorized for use for instream flows, irrigation, municipal, or other beneficial uses consistent with applicable regional plans for pilot planning areas, or to resolve critical water supply problems" (RCW 90.42.040). The state may acquire all or portions of existing water rights for the Trust Water Rights Program by purchase, gift or other appropriate means, but not by condemnation. The state may acquire the rights on a permanent or temporary basis. For those rights donated or acquired on a temporary basis, the full amount of the right must be placed in the trust water rights program. The state may not expend any funds to purchase water rights unless specifically appropriated by the legislature. Trust water rights donated to assist in providing instream flows and those acquired by lease must not exceed the amount used during the five years prior to acquisition, nor may the total of any portion of the right that remains with the original water right holder plus the portion in the Trust Water Rights Program exceed the amount used during the five years prior to acquisition (RCW 90.42.080).

The processes described in Alternatives WP 7 and WP 8, and potentially, Alternatives WP9 and WP10 could be combined and expanded to involve use of the Trust Water Rights Program in the development and operation of a **water bank** for both instream and out-of-stream uses. Engrossed Substitute House Bill 1640 enacted by the 2003 Washington State Legislature authorized water banking within the Trust Water Rights Program, including specific provisions of use of Trust Water Rights Program for water banking purposes in the Yakima River basin. Water banking is a phrase that has been used for many different functions. In general, it refers to a formalized exchange of water rights in a particular area. A water bank transaction is one that involves the transfer of all or a portion of a water right from the owner of the right to the buyer(s)/new user(s) of the right. The institution serving as the water bank will deposit the water right into trust to be held for a period of time until a buyer of the water right is identified. The water bank is the institutional framework that comprises the rules and other market mechanisms to meet the basic needs of buyers and sellers, and to facilitate pricing, documentation, and completion of the transactions.

There are a number of different models for water banking. **Instream banking** is the simple cessation of the use of a water right for an out-of-stream purpose, for a defined period (lease or option) or retirement perpetuity (purchase or donation) to be used for instream flow improvements. **Timed banking** is a term used to describe water that is held, for example, in a reservoir, for release at a future time to the receiving stream. **Exchange banking** involves a water bank, such as the Trust Water Rights Program, operating as a broker for those looking to sell or buy water.

- Many of the current water right transfer and acquisition activities in Washington State are essentially the same as water banking, but these transactions have not been tracked in terms of "deposits" and "withdrawals" and have not been characterized as water banking.

Alternative WP 9. Transfer water through interties of public water systems or irrigation systems.

Public water system interties are interconnections between two or more public water systems that allow the exchange or delivery of water between public water systems to increase water system reliability and/or to achieve public health and resource management objectives (RCW 90.03.383). The exchange or delivery of water enabled by an intertie must by within the limitations of the withdrawal or diversion rates established under the participating public water systems' existing water right permits or certificates, or contained in claims.

Irrigation system interties involve transfers of water between two or more irrigation entities (for example, irrigation districts) that own or are trustees of water rights from the same source, or that use common works for diversion, transportation, or drainage for all or any part of their respective irrigation supplies. Such transfers are managed by a joint board of control established pursuant to Chapter 87.80 RCW.

Alternative WP 10. Request Ecology to allocate additional ground or surface water on a short-term or long-term basis.

Under this alternative, a watershed plan would request that Ecology allocate ground or surface water from a specific source (surface water body or aquifer) for a specific beneficial use, such as municipal supply, or multiple beneficial uses. In order for Ecology to issue a new water right, four tests as stipulated in Chapter 90.03 RCW must be met:

- The water must be available for allocation;
- The water must be proposed to be put to a beneficial use;
- Use of the water must not impair existing water rights; and
- Use of the water must not be contrary to the public welfare.

Alternative WP 11. Request Ecology to adopt a rule to close or partially close a basin or subbasin.

The Water Resources Act of 1971 (Chapter 90.54 RCW) provides authority for Ecology to withdraw waters in a basin or subbasin from further appropriation based on a determination that insufficient information and data are available to support sound resource allocation decisions or that water resources have been over appropriated. Prior to initiating such rule making, Ecology would need to consult with the standing committees of the State Senate and House of Representatives with jurisdiction over water resources.

Alternative WP 12. Request Ecology to initiate an adjudication of a basin or subbasin.

The adjudication process is the sole means to determine the existence, amount, and priorities of existing water rights. An adjudication can be petitioned by Ecology or by one or more persons claiming a right to divert water. Under the adjudication process, Ecology must file with the superior court a report containing the names of all those claiming a right to use water, a description of the claim, and a brief statement of facts relating to each claim and water use. Those claiming a right to use water are defendants in the adjudication and bear the burden of proving their claimed right. At the end of the adjudication, the court issues a decree confirming water rights and describing the nature of those rights. Ecology then issues water right certificates that incorporate the court's findings. Water rights that are not confirmed by the court are lost or extinguished.

Alternative WP 13. Request Ecology to assign a watermaster to a basin, subbasin, or other geographic area.

A watermaster controls the use of water in a designated watermaster district by regulating headgates and reservoirs to prevent the use of water in excess of the amount to which water right holders are entitled. A watermaster is appointed, compensated, and supervised by Ecology. Alternatively, in an adjudicated basin or subbasin, a stream patrolman may be appointed by the Department of Ecology if requested by water users in the basin or subbasin. A stream patrolman has the same powers as a water master, but the stream patrolman's jurisdiction is limited to the adjudicated stream. The salary of a stream patrolman is paid by the jurisdictional county government, which may assess water users for their proportionate share of the salary.

Alternative WP 14. Request Ecology to increase enforcement against illegal water use within a basin or subbasin.

Under this alternative, Ecology would assign staff to focus on enforcement activities within a basin or subbasin identified by a watershed plan.

Alternative WP 15. Request Ecology to evaluate some set or subset of existing water rights within a basin or subbasin to identify those that are subject to relinquishment.

Under this alternative, Ecology would assign staff to evaluate existing water rights within a basin or subbasin identified by a watershed plan to determine if quantities of water allocated through water rights are actually being put to a beneficial use and over what time period. The purpose of the evaluation would be to identify water rights that have been partially or totally abandoned, or that have not been put to beneficial use for a period of at least five consecutive years without sufficient cause (causes are enumerated in Chapter 90.14 RCW – See Section 3.1.4). Water right holders meeting such criteria could be requested to voluntarily relinquish their rights, or Ecology could declare through an administrative order that the rights have been relinquished, subject to appeal to the Pollution Control Hearings Board.

Alternative WP 16. Request local governments to adopt regulations or for Ecology to adopt rules to minimize use of exempt wells, to restrict the siting of wells in proximity to streams, and/or to restrict the finished depth of new wells to the second aquifer unit or lower.

Chapter 90.44 RCW establishes an exemption from water right permitting requirements for ground water for: "stock watering purposes, or for the watering of a lawn or of a noncommercial garden not exceeding one-half acre in area, or for single or group domestic uses in an amount not exceeding five thousand gallons per day, or for an industrial purpose in an amount not exceeding five thousand gallons per day." This alternative would not necessarily preclude the construction of exempt wells in an area, but would place restrictions through local land use regulations or Ecology rule on the circumstances under which such wells would be permitted.

Alternative WP 17. Where adequate public water supplies are available, extend public water system service into areas served by exempt wells and require any new development to connect to such public water supplies.

This alternative would preclude use of new exempt wells in an area. It is not likely that owners of existing exempt wells could be required to connect to the public water system; however, by providing water from a safe, reliable public water system, existing exempt well users in an area would be afforded a viable alternative to their current water source. Connection to a public water system may be particularly attractive to exempt well owners in areas with impaired water quality or low well yields. A variation of this alternative would be to prohibit any new exempt wells if water from a public water system is reasonably available to serve an affected property.

Alternative WP 18. Request Ecology to require water users to install, operate, and maintain water quantity monitoring devices such as meters and gauges.

This alternative could be accomplished through permit conditions and implementation of existing rules and statutes. Under provisions of Chapter 173-173 WAC, Ecology is actively enforcing measurement requirements for the following types of diversions and withdrawals of water:

- All new surface water permits;
- New and existing surface water rights where the diversion of any volume of water is from waters containing depressed or critical salmon stock;
- New and existing ground water rights where Ecology concludes that the withdrawal of any volume of water may affect surface waters containing depressed or critical salmon stock; and
- Existing water rights where the diversion volume exceeds one cubic foot per second.

Ecology has statutory authority to require any surface water right holder to measure their water use (RCW 90.03.360). Additionally, Ecology has statutory authority to require any ground water withdrawal, including those from exempt wells, to be measured and information regarding the quantity of the withdrawal to be reported to the department (RCW 90.44.050; RCW 90.44.250; RCW 90.44.450).

5.2.3 Develop or Improve Water Resources Storage Infrastructure

Alternative WP 19. Construct and operate new on-channel storage facilities.

Under this alternative, a water storage facility would be created by impounding a river or stream. On-channel storage facilities could include large reservoirs on the mainstream of major rivers as well as small reservoirs on tributary streams. Construction could involve creation of an earthen dam or a concrete dam.

Alternative WP 20. Raise and operate existing on-channel storage facilities.

Under this alternative the capacity of an existing on-channel reservoir would be increased by raising or enlarging the impoundment structure.

Alternative WP 21. Construct and operate new off-channel storage facilities.

Under this alternative, an impoundment structure, either earthen or concrete, would be created in an upland location. Water would be diverted, or more likely pumped, from a river to an off-channel location for storage. Off-channel facilities could have a wide range of capacities.

Alternative WP 22. Raise and operate existing off-channel storage facilities.

Under this alternative the capacity of an existing off-channel reservoir would be increased by raising or enlarging the impoundment structure.

Alternative WP 23. Use existing storage facilities for additional beneficial uses.

Operation of a storage facility constructed to provide water for one specific beneficial use or group of uses could be modified to provide water for additional beneficial uses. For example, use of a storage facility originally constructed for municipal water supply could be expanded to supply water for irrigation or to provide additional flows for fish during critical life stages.

Alternative WP 24. Construct and operate artificial recharge/aquifer storage projects.

Aquifer storage and recovery involves introducing water, usually surface water from rivers, into an aquifer through injection wells or through surface spreading and infiltration. The introduced water is stored in the aquifer until needed and then withdrawn from the aquifer through wells for beneficial use. Water to be stored in an aquifer must meet the state's ground water quality standards, Chapter 173-200 WAC. Aquifer storage and recovery does not include operational losses of water during irrigation of land; to water artificially stored due to construction, operation, or maintenance of an irrigation system; or to projects involving recharge of reclaimed water (RCW 90.03.370). Recharge and recovery of reclaimed water are addressed in Alternative WP 5.

5.2.4 Take No Action

Alternative WP 25. Take no action regarding water quantity.

The water quantity no action alternative is to be considered only in the context of WRIAs engaged in watershed planning under Chapter 90.82 RCW and is intended to provide a means of comparing the impacts associated with inaction with the impacts of various action alternatives. It is recognized that in a number of the state's WRIAs, watershed planning and management processes are occurring outside of the framework established under Chapter 90.82 RCW.

5.3 INSTREAM FLOW ALTERNATIVES

In WRIAs or multi-WRIA planning areas where the initiating governments agree, by majority vote, to include an instream flow component, the approach to that component must conform with conditions stipulated in RCW 90.82.080. Instream flows that have already been adopted by rule for streams within WRIA or multi-WRIA planning areas can only be proposed for modification if all local government and tribal members of the planning unit that are present for a recorded vote unanimously vote to request Ecology to make such modifications.

If instream flows have not been adopted by rule for streams within WRIA or multi-WRIA planning areas, instream flows are to be set in a collaborative process between the planning unit and Ecology. Proposed instream flows established in that manner will be considered approved if all units of government and tribal members of the planning unit that are present for a recorded vote unanimously vote to support the proposed flows along with a majority of non-government members present for the same recorded vote.

Once approved, Ecology can adopt the instream flows by rule either by the rules adoption process set forth in Chapter 34.05 RCW, the expedited rules adoption process in RCW 34.05.230, or through a rules adoption process that uses public hearings and notice provided by the jurisdictional county legislative authority. Preparation of a small business economic impact statement under RCW 34.05.328 is not required for instream flow rule making. If approval is not achieved on instream flows within four years of the date that a planning unit first received funds for a Phase 2 technical assessment, Ecology may initiate rule making and would have an additional two years to establish such flows. Prior to setting instream flows, Ecology is required to engage in government-to-government consultation with affected tribes.

A description of the instream flow "action" alternative is provided below, along with that for an instream flow "no action alternative." Impacts and mitigation measures associated with these alternatives are discussed in Chapter 6.

5.3.1 Set Instream Flows

Alternative WP 26. Request Ecology to set instream flows by administrative rule (in the Washington Administrative Code, or WAC).

> Under this alternative, a planning unit would provide Ecology with recommendations for setting instream flows for specific stream reaches within a WRIA in accordance with provisions of Chapter 90.82 RCW. The Watershed Planning Act defines minimum instream flow as:
>
> > . . . a minimum flow under Chapter 90.03 or 90.22 RCW or a base flow under Chapter 90.54 RCW (Chapter 90.82.030).

The proposed instream flows would be developed for two primary water management purposes: 1) to define stream flows that need to be met in specific stream reaches at specific times to protect instream resources, and 2) to determine if and in what quantity water is surplus to instream needs and existing water rights. Recommended instream flows could be proposed for streams for which an instream flow rule has already been adopted as well as for those for which no instream flow rule has been adopted. Ecology would undertake rule making in accordance with the Administrative Procedures Act (Chapter 34.05 RCW).

5.3.2 Take No Action

Alternative WP 27. Take no action regarding instream flows.

Under this alternative no recommendations for instream flows would be proposed. In cases where an instream flow has previously been adopted by rule, the decision to not develop recommendations for instream flows could be made based on a determination that the existing flows are adequate for water management purposes. In cases where an instream flow has not previously been adopted by rule, the decision to not develop recommendations for instream flows could be made based on a determination that there is currently no need to take such action from a water management perspective. However, in both cases there may be an acute need to establish or revise instream flows, but a planning unit may decline to engage in that activity.

5.4 WATER QUALITY ALTERNATIVES

If initiating governments choose to include a water quality component in their watershed plan, according to Chapter 90.82 RCW, the plan must include the following:

- A recommended approach for implementing the total daily maximum load established for achieving compliance with water quality standards for nonmarine water bodies in the watershed planning area unless a total maximum daily load process has begun in the planning area as of the date the watershed planning process is initiated; and

- A recommended means of monitoring by appropriate government agencies whether actions taken to implement the approach to improvements in water quality are sufficient to achieve compliance with water quality standards.

However, planning units, lead agencies, or local governments are precluded from establishing or adopting water quality standards or total maximum daily loads under the federal Clean Water Act.

The water quality alternatives evaluated as part of this document fall into the following three general categories of potential recommended actions:

- Improve point source pollution control;

- Improve nonpoint source pollution control; and

- Modify land/shoreline use activities to protect, preserve, or enhance water quality.

Descriptions of the water quality alternatives are provided below, along with that for a water quality "no action alternative." The environmental impacts and potential mitigation measures associated with these alternatives are discussed in Chapter 6.

5.4.1 Improve Point Source Pollution Control

Alternative WP 28. Request local governments or sewer utilities to construct and operate water reclamation and reuse facilities (e.g., reclamation plants and use areas) to reduce wastewater discharges to surface water bodies and improve water quality in receiving waters.

> This alternative is similar to Alternative WP 5 discussed previously. While Alternative WP 5 focuses on conducting water reclamation and reuse to create "new" water supply, the purpose of this alternative is to improve receiving water quality by reducing wastewater discharges to such waters, or to limit future discharges of wastewater to receiving waters associated with planned growth and development.

Alternative WP 29. Request Ecology to implement a pollution trading (credit) system for water in order to facilitate compliance with a Total Maximum Daily Load.

> Under a pollution trading system, proponents of a new or expanding contaminant generating land or water use could receive a certain number of pollution "credits" by reducing a specified amount of existing contaminant loading to surface or ground water. The reduction in contaminant load could be accomplished by modifying facilities owned by the proponent, by paying owners or operators of other contaminant generating facilities to make operational changes, or by purchasing and retiring contaminant generating facilities. The proponent can then redeem the "credits" for approval of the new or expanding contaminant generating land or water use, provided appropriate pollution control technologies are applied. However, the transaction would need to result in a net reduction in contaminant loading within the area addressed by the trading system (more contaminant loading would be eliminated in obtaining credits than would be created by the new or expanding land or water use).

Alternative WP 30. Request Ecology to incorporate requirements for improving the quality of discharges from existing industries when issuing State Waste Discharge Permits or National Pollutant Discharge Elimination System Permits.

> Under this alternative, Ecology would need to evaluate State Waste Discharge Permit and National Pollutant Discharge Elimination System Permit discharge requirements on a case-by-case basis to ensure that such requirements represent or incorporate all known, available, and reasonable methods of prevention, control, and treatment. Should it be determined that additional increments of prevention, treatment, and control could

reasonably be attained, permit requirements would be modified to help ensure that such incremental improvements would be achieved.

Alternative WP 31. Request Ecology to increase the level of inspection of commercial dairy operations and enforcement of water quality as appropriate.

Ecology's Water Quality Program currently maintains a dairy inspection program to administer the provisions of the state's Dairy Nutrient Management Act (Chapter 90.64 RCW) and the wastewater discharge general permit for dairy farms issued under requirements of the federal Clean Water Act. The primary purpose of the inspection program is to prevent entry of wastes into waters of the state. This alternative would request Ecology to increase the level of dairy inspections within a specific geographic area based on findings of a Phase 2 Watershed Assessment.

5.4.2 Improve Nonpoint Source Pollution Control

Alternative WP 32. Request that Ecology expedite development and implementation of a Total Maximum Daily Load for a basin or subbasin.

Ecology's Water Quality Program annually prepares a prioritized list of water bodies that are on the 303(d) list of polluted waters and for which Total Maximum Daily Loads (TMDLs) or cleanup plans will be developed. Currently no provisions exist for Ecology to prepare a TMDL for a specific 303(d) listed body of water out of the sequence stipulated in the prioritized list. There are, however, several possible options for meeting the intent of this alternative:

- If targeted funding is provided to Ecology for the purpose of preparing a TMDL for a specific 303(d) listed body of water;

- If a planning unit provides Ecology with information that would elevate the priority of a specific 303(d) listed body of water when Ecology develops its next annual list; or

- If a planning unit or other entity within a watershed generates and provides to Ecology all data necessary for development of the TMDL for a specific 303(d) listed body of water.

Alternative WP 33. Request conservation districts or irrigation districts to assist in achieving reductions in nonpoint pollution and/or to implement Total Maximum Daily Loads established for specific federal 303 (d) listed water bodies.

Conservation Districts throughout the state, in cooperation with the federal Natural Resources Conservation Service, are actively involved in implementing technical, financial, and educational programs intended to promote natural resource management practices that protect water quality. Similarly, many irrigation districts engage in programs intended to promote protection of water quality by water users within their districts. Additionally, irrigation districts strive to conduct system operations in a manner that minimize adverse impacts on water quality. This alternative would involve requesting targeted assistance from conservation districts and irrigation districts in response to water quality problems identified through a Phase 2 Watershed Assessment.

Alternative WP 34. Request conservation districts to modify individual farm plans as necessary to reduce or prevent nonpoint pollution and erosion.

Conservation Districts throughout the state, in cooperation with the federal Natural Resources Conservation Service, assist individual farmers and woodland owners in developing plans to improve productivity of their lands and to conserve water, protect water quality, and protect fish habitat through implementing best management practices (BMPs). Landowner participation in BMP implementation is voluntary. This alternative would involve requesting targeted assistance from conservation districts and irrigation districts in response to water quality problems identified through a Phase 2 Watershed Assessment.

Alternative WP 35. Request local governments and state agencies to continue to implement or more fully implement existing water quality plans, including plans developed under Chapter 400-12 WAC.

A number of local communities have previously developed water quality oriented plans, such as watershed plans prepared under Chapter 400-12 WAC and ground water management plans and programs under Chapter 173-100 WAC, the provisions of which may not have been fully implemented. This alternative would involve requesting the local governments and state agencies responsible for implementation of such unimplemented provisions to complete the implementation process.

Alternative WP 36. Develop and implement a water quality public education program intended to prevent or reduce nonpoint pollution with focus on pollution sources associated with an urban setting, or with focus on pollution sources associated with a rural setting.

Water quality education and outreach programs can be developed and implemented by a variety of entities including state agencies, local governments, local health jurisdictions, public water systems, conservation districts, tribes, and citizen organizations. Such programs can also be developed by one entity, but implemented by another. Water quality educational programs and related materials can be tailored to address specific contaminant sources, such as on-site sewage systems or pesticide and fertilizer use, or broadly address all contaminant sources that might be present within a specific land use setting, such as rural land use or urban land use. Similar public education programs could be developed for other aspects of watershed planning such as water conservation or habitat protection.

Alternative WP 37. Request local governments and Ecology to develop and operate water quality monitoring programs, including installation and maintenance of monitoring devices, to measure the extent of nonpoint pollution and/or measure the effectiveness of nonpoint pollution control measures.

> Ecology and many local governments are engaged in water quality monitoring. Existing monitoring programs involve installation of monitoring devices (for example, monitoring wells), data collection including compilation of routine sampling information (for example public water monitoring results) and conducting special water quality surveys, and data evaluation. Monitoring programs are essential in supporting adaptive management programs. This alternative would involve requesting Ecology or a local government to provide targeted monitoring in response to water quality problems identified through a Phase 2 Watershed Assessment.

5.4.3 Modify Land/Shoreline Use Activities to Protect, Preserve, or Enhance Water Quality

Alternative WP 38. Request local governments to modify Growth Management Act comprehensive plans and other land use plans to help reduce the potential for nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303 (d) listed water bodies.

> Land use plans could be modified to limit the distribution or density of specific types of land use that have a relatively high potential for causing ground or surface water quality degradation identified through a Phase 2 Watershed Assessment. Environmental values are typically considered in the development of comprehensive plans. This alternative would involve a re-evaluation of environmental values related to water quality in the context of water quality data.

Alternative WP 39. Request local governments to amend shoreline master programs to help reduce the potential for nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303 (d) listed water bodies.

> Local governments would be requested to re-evaluate the provisions of their shoreline master programs, such as permitted uses in sensitive shoreline environments or development setbacks, to determine their effectiveness in addressing water quality degradation identified through a Phase 2 Watershed Assessment. Local governments would be expected to adopt master program amendments as appropriate to address any deficiencies and Ecology would be expected to expeditiously review and take appropriate action regarding the master program amendments.

Alternative WP 40. Request local governments to modify local regulations such as critical areas ordinances, stormwater regulations, and on-site sewage regulations to help reduce the potential for nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303 (d) listed water bodies.

> Similar to Alternative 39, this alternative would request local governments to re-evaluate the provisions of their critical areas ordinances, stormwater regulations, on-site sewage regulations, and other ordinances relating to water quality to determine their effectiveness

in addressing water quality degradation identified through a Phase 2 Watershed Assessment. Local governments would be expected to revise or amend such ordinances and regulations as necessary to address any identified deficiencies.

5.4.4 Take No Action

Alternative WP 41. Take no action regarding water quality.

The water quality no action alternative is to be considered only in the context of WRIAs engaged in watershed planning under Chapter 90.82 RCW and is intended to provide a means of comparing the impacts associated with inaction with the impacts of various action alternatives. It is recognized that in a number of the state's WRIAs, watershed planning and management processes are occurring outside of the framework established under Chapter 90.82 RCW.

5.5 HABITAT ALTERNATIVES

If initiating governments choose to include a habitat component in their watershed plan, the plan must be coordinated or developed in a manner that serves to protect or enhance fish habitat in the WRIA or multi-WRIA planning area. Provisions of the plan relating to habitat must be based or rely on existing laws, rules, or ordinances created for the purpose of protecting, restoring, or enhancing fish habitat. Such existing laws, rules, or ordinances include the Shoreline Management Act (Chapter 90.58 RCW), the Growth Management Act (Chapter 36.70A RCW), and the Forest Practices Act (Chapter 76.09 RCW). Planning activities under Chapter 90.82 RCW must also be integrated with strategies developed as part of other processes undertaken in response to potential or actual listing of salmon and other fish species as being threatened or endangered under the federal Endangered Species Act. In WRIAs or portions of WRIAs where habitat restoration activities are being developed and implemented under the Salmon Recovery Act (Chapter 77.85 RCW), such activities must be relied upon as the primary nonregulatory habitat component for fish habitat in the watershed plan.

The habitat alternatives evaluated as part of this document fall into the following five general categories of potential recommended actions:

- Conduct instream modifications to fish habitat;
- Conduct out-of-stream modifications to riparian habitat;
- Modify land/shoreline use to protect, preserve, or enhance habitat;
- Improve or enhance hatchery operations; and
- Improve forest practices.

Descriptions of the habitat alternatives are provided below, along with that for a habitat "no action alternative." The environmental impacts and potential mitigation measures associated with these alternatives are discussed in Chapter 6.

5.5.1 Conduct Instream Modifications to Fish Habitat

Alternative WP 42. Implement habitat improvement projects involving construction or placement of instream structures, such as cross vanes, vortex weirs, large woody debris, fish screens, or side-channels.

> Some stream reaches have been modified by human activities in a manner that simplifies channel geometry (for example, straightening, dredging, and diking). Simplifying the channel geometry can disconnect the channel from its floodplain, side-channels, and off-channel habitats and may adversely affect fish habitat. Introduction of instream structures, installation of fish screens, and reconnection of streams with side channels are management actions that are intended to improve habitat quality and quantity.

Alternative WP 43. Implement habitat improvement projects intended to "daylight" streams that are currently contained within enclosed channels.

> Some stream reaches in the state have been placed in enclosed channels or piping systems. Such actions have been undertaken for various reasons, usually associated with land development activities. As a result of these types of actions, portions of the streams' aquatic and riparian habitats have been destroyed and, in some cases, fish migration has been impaired. Opening such streams and restoring aquatic and riparian habitat would help reestablish their natural functions.

Alternative WP 44. Request local governments to route treated stormwater to water limited streams to allow for channel maintenance.

> Under this alternative additional flows would be provided to a reach of a river or stream by introducing stormwater runoff that has been treated as needed to prevent significant adverse impacts to water quality. This action would be intended to improve the quality and quantity of habitat.

Alternative WP 45. Request the Washington Department of Transportation, local governments, or other applicable agencies to remove or replace bridges, culverts, roadways, and other infrastructure as necessary to eliminate or reduce their impacts as fish passage obstructions and/or channel constrictions.

> Many existing road and highway infrastructure were designed and constructed without a significant level of consideration of their impacts on habitat and fish passage. As information continues to be generated through Phase 2 Watershed Assessments and Limiting Factors Analyses regarding impediments to restoration of watershed health and salmon recovery, specific road and highway infrastructure may be identified as being in need of redesign and upgrade or replacement. For example, bridges and bridge

approaches that severely constrict rivers channels will tend to prevent channel migration and impair floodplain function.

Alternative WP 46. Support construction of fish passage facilities where such facilities do not currently exist.

Anadromous fish often travel great distanced during juvenile outmigration to estuarine and ocean feeding grounds and, as adults, during their return trip to their breeding grounds to spawn. Numerous rivers streams in the state have had structures constructed in their channels that present a barrier to fish migration. These structures have impaired or eliminated access by anadromous fish to habitat that historically has been occupied by such fish. Under this alternative, a planning unit would advocate the modification or removal of structures identified through a Phase 2 Watershed Assessment as representing a barrier to fish passage.

5.5.2 Conduct Out-of-Stream Modifications to Riparian Habitat

Alternative WP 47. Implement habitat improvement projects involving out-of-stream riparian restoration or enhancement such as replanting or bank stabilization projects. Bioengineering methodologies should be incorporated into bank stabilization projects.

The riparian habitat of many of the state's rivers and streams has been degraded over time. Phase 2 Watershed Assessments may identify reaches of rivers and streams within a WRIA where riparian habitat restoration is necessary to reduce sediment loading, increase cover and shading, and improve recruitment of large woody debris, and recommend projects to accomplish such restoration. Projects can include planting of various grass, shrub, and tree species, and may also involve bioengineering techniques such as the use of willow bundles.

This alternative could be modified to address nearshore marine habitat. For example, the alternative could be presented as:

> Implement habitat improvement projects involving bank stabilization and protection efforts to restore marine shoreline littoral processes, marine shoreline riparian vegetation, and estuarine habitat in areas of important habitat for migrating salmon and spawning areas for surf smelt and sand lance.

The impacts resulting from the modified alternative would be similar to those discussed in Section 6.47.

Alternative WP 48. Move river dikes back from existing river channels to allow for floodplain restoration and channel maintenance.

As noted under the discussion of Alternative WP 42, the channel geometry of some river and stream reaches has been greatly simplified by straightening and diking. Diking can disconnect the channel from its floodplain, side-channels, and off-channel habitats and may adversely affect fish habitat. Through removal of existing dikes and their relocation further landward, a river or stream can be allowed to reestablish more natural and proper floodplain function.

5.5.3 Modify Land/Shoreline Use to Protect, Preserve, or Enhance Habitat

Alternative WP 49. Request local governments to amend or modify Growth Management Act comprehensive plans or other land use plans, shoreline master programs, and/or critical areas ordinances to protect habitat or control floodplain development.

Local governments could be requested to modify land use plans to limit or eliminate land use activities identified through a Phase 2 Watershed Assessment as not being appropriate for location in a floodplain or that may have an adverse impact on habitat. Additionally, local governments could be requested to re-evaluate the provisions of their shoreline master programs, such as permitted uses in sensitive shoreline environments or development setbacks, to determine their effectiveness in protecting habitat and modify their master programs as appropriate. Similarly, local governments could be requested to modify critical areas ordinances to address habitat problems identified through a Phase 2 Watershed Assessment.

Alternative WP 50. Request local governments to develop regulations or programs to control sources of sediment that are not addressed through critical areas ordinances or other existing regulations and programs.

This alternative may involve amending existing critical areas ordinances or grading and filling ordinances, creation of new ordinances, or development of educational programs to provide control over erosion and sedimentation sources that are not currently addressed.

Alternative WP 51. Request local governments to integrate habitat improvement planning into flood hazard reduction plans.

Many communities across the state have engaged in or are engaged in flood hazard reduction planning and floodplain management. Concepts that are important to the health of watershed habitat such as restoration of floodplain function, preservation or re-establishment of natural riparian habitat, and preservation of riparian wetland functions should be, if not already, integrated into flood hazard reduction planning.

Alternative WP 52. Request conservation districts and irrigation districts to assist in achieving protection of habitat including, as appropriate, establishment and maintenance of riparian buffers and control of erosion and sedimentation.

Conservation Districts throughout the state, in cooperation with the federal Natural Resources Conservation Service, are actively involved in implementing technical, financial, and educational programs intended to promote natural resource management practices that protect, restore, and enhance fish and wildlife habitat. Similarly, many irrigation districts engage in programs intended to promote habitat protection by water users within their districts. Additionally, irrigation districts strive to conduct system operations in a manner that minimize adverse impacts on habitat and fish populations. This alternative would involve requesting targeted assistance from conservation districts and irrigation districts in response to habitat problems identified through a Phase 2 Watershed Assessment.

Alternative WP 53. Request local, state, and federal governments, conservation districts, and private entities to acquire land and/or conservation easements for purposes of protecting habitat.

Both federal, state, local, and tribal government as well as private organization can acquire lands through purchase, donation, or other means for protection of fish and wildlife habitat. This includes lands along rivers, lakes, or estuaries or lands containing valuable wetland complexes. Conservation easements can be a less expensive option to outright purchase. Under conservation easements, property owners retain rights to use portions of their property, but set aside critical habitat areas, such as shoreline areas or buffers, for non-use and retention of their natural state.

Alternative WP 54. Request Ecology and local governments to increase the level of enforcement of Shoreline Management Act violations in critical habitat areas.

Ecology and local governments would be asked to increase enforcement activities within portions of a watershed's shoreline environments where critical habitat is being degraded or at risk of being degraded as demonstrated through a Phase 2 Watershed Assessment. This would involve enforcement of violations of the conditions of shoreline substantial development permits, conditional use permits, and variances as well as shoreline development that has or is occurring without required permits.

5.5.4 Improve or Enhance Hatchery Operations

Alternative WP 55. Require proponents of new or expanding fish hatcheries to follow the recommendations of the Hatchery Scientific Review Group regarding siting, interaction with native stocks, and water quality.

The Hatchery Scientific Review Group was formed as part of the Puget Sound and Coastal Hatchery Reform Project. The area-wide recommendations prepared by the group include a call for hatcheries to be operated in the context of their ecosystem, including consideration of the impacts of hatchery operation on aquatic habitats. This alternative would also be appropriate within the habitat component of a watershed plan.

5.5.5 Improve Forest Practices

Alternative WP 56. Support implementation of the recommendations of Washington's Forest and Fish Report.

Most of the findings of the Forest and Fish Report have been codified as part of the state's Forest Practices Act (Chapter 76.09 RCW), administered by the Department of

Natural Resources. Through this alternative, a planning unit would offer assistance in gaining public and land owner support for implementation of the Forest and Fish Report recommendations through outreach activities and other appropriate measures, primarily targeting local governments.

5.5.6 Take No Action

Alternative WP 57. Take no action regarding habitat.

The habitat no action alternative is to be considered only in the context of WRIAs engaged in watershed planning under Chapter 90.82 RCW and is intended to provide a means of comparing the impacts associated with inaction with the impacts of various action alternatives. It is recognized that in a number of the state's WRIAs, watershed planning and management processes are occurring outside of the framework established under Chapter 90.82 RCW.

CHAPTER 5 REFERENCES

Economic and Engineering Services (EES). Guide to Watershed Planning and Management - Addendum No. 1. Prepared for Association of Washington Cities, Washington State Association of Counties, Washington State Water Resources Association, Washington Association of Sewer and Water Districts, and Washington Public Utility District Association. December 2001.

Sherman, K., On-Site Grey Water [sic] System Research from a National Perspective, *Florida Journal of Environmental Health*, Horizons in Environmental Health, Issue 134, May 1991.

State laws (RCWs) can be viewed at http://www.leg.wa.gov/ws/adm/rcw.cfm.

State rules and regulations (WACs) can be viewed at http://leg.wa.gov/wac.

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CHAPTER 6.0
IMPACTS AND MITIGATION MEASURES

This chapter contains an evaluation of impacts, including direct, indirect, and significant unavoidable adverse impacts, as well as possible mitigation measures for the alternatives that are enumerated in Chapter 5. A narrative for each of the alternatives evaluated in this chapter is provided in Chapter 5 and the reader is encouraged to refer back to that chapter for more information about the nature of a specific alternative.

As noted in Chapter 5, the alternatives evaluated in this chapter were developed based on input from local lead agencies, planning units, and Ecology watershed leads. Early in the environmental impact statement process, questionnaires were distributed to planning units through 14 Ecology watershed leads representing, at that time, 32 watershed planning efforts in 41 WRIAs. The questionnaires were intended to solicit information from planning units regarding recommended actions that they were considering in their planning processes.

Six Planning Units provided written responses to the questionnaires. This information was supplemented by interviews of five watershed leads representing an additional nine watershed planning efforts. A number of the watershed leads and lead agencies that did not provide responses to the questionnaire indicated that their planning efforts had not advanced to the point where actions that would likely be included in their watershed plan could be identified. Others indicated that while there had been some initial deliberation concerning actions that might be included in their watershed plans, they considered the identified actions too tentative or preliminary to identify as probable elements of their plans.

Since this is a statewide, nonproject environmental impact statement, the alternatives evaluated in this chapter are generic in nature and do not address site-specific activities. Additionally, the alternatives are generally not mutually exclusive.

For purposes of the evaluation, the alternatives are organized by the four components of watershed planning under Chapter 90.82 RCW: water quantity; instream flow; water quality; and habitat. The evaluation of impacts and mitigation measures for each alternative is segregated by the applicable elements of the environment (for example, earth, air, surface water, ground water, etc.) as enumerated in the State Environmental Policy Act Rules (WAC 197-11-444). For alternatives where no impact is anticipated or no mitigation measures are appropriate for a specific element of the environment, that element of the environment is omitted from the discussion.

WATER QUANTITY ALTERNATIVES

6.1 Alternative WP 1: Develop and implement municipal conservation programs including demand management and operational efficiency measures.

6.1.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, leak repair, and distribution system upgrades). Activities such as land clearing, excavation, and filling could increase soil erosion by removing protective vegetation, disaggregating the soil, and modifying slopes and drainage patterns. The magnitude of these potential impacts would depend on the type and scale of the construction activities, the inherent erodibility of the local soils, the local climate, and the season during which the construction would occur.

Air

Short-term impacts

Implementation of municipal conservation programs could include construction activities that require the use of heavy equipment and vehicles (for example, excavation, grading, filling, and material haul activities). Although construction activities are generally temporary in nature, some amount of fugitive dust and equipment combustion emissions would occur. However, Ecology rules and/or those of the local governing air agency would prohibit emissions of fugitive dust unless they are controlled with best available control technologies. In addition, most of the construction equipment emission sources would be mobile and intermittent in nature, and their resulting combustion emission pollutant impacts would not be large enough in a localized area to cause an exceedance of any ambient air quality standard. Consequently, the construction activities associated with municipal conservation programs could produce adverse, but likely insignificant, air quality impacts within a project region.

Long-term/operational impacts

Some amount of fugitive dust and combustion emissions could be generated by vehicles during maintenance activities associated with municipal conservation programs. However, these emissions would be negligible and infrequent in nature. No other long-term emissions sources are anticipated as a result of the implementation of the conservation programs.

Surface Water

Short-term impacts

This alternative may result in temporary, construction-related impacts to surface waters. For example, a leak detection and replacement program may have short-term construction impacts while pipelines are repaired or replaced as necessary. Increasing incentives to install low volume showerheads and toilets will have no short-term impacts.

If the alternative includes construction or modification of facilities, construction activities may result in increases in local surface erosion. There is potential for sediment to be transported to streams or other water bodies. The potential will be a function of the proximity of the project to a water body, the volume of sediment generated, the condition of vegetative buffers between the site and the water body, and the Best Management Practices (BMPs) applied to control that erosion. Inputs of sediment to any water body may increase turbidity until the site is revegetated. Inputs of fine sediment may also affect the substrate condition in streams. The level of impact will vary with the amount of sediment input into the water body.

Long-term/operational impacts

For cases in which both the point of diversion and place of water use occur in the same basin, saved water due to conservation measures may reduce demand from stream flow sources, thereby providing more water available for instream flows and other beneficial uses.

This alternative may make more water available for instream flows and other beneficial uses. Demand management strategies such as increasing rate structures and public education should promote conservation and therefore require less water to be diverted from the source. Replacing leaky pipelines and retrofitting plumbing fixtures will also save on the amount of water required to serve customers. Secondary effects include locally reduced recharge from these previously leaking conveyance facilities potentially altering the timing of baseflows.

Increases in flow may subsequently reduce stream temperature, and increase dissolved oxygen, particularly in situations where summer water depths are currently low and flows are substantially increased. Increased flows may also result in reductions in the concentrations (not total load) of other pollutants.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce withdrawals of ground water and increase water table elevations in those areas where ground water is used for municipal or domestic supply. The magnitude of this impact would depend on the amount of the reduction in demand and on the proportion of the water that is supplied by ground water resources.

Plants

Short-term/operational impacts

If implementation of municipal conservation programs entails construction activities, plant communities may be displaced.

Long-term/operational impacts

Riparian vegetation may, or may not benefit from this type of project that increases instream flow, as there would need to be significant increases in instream flow to significantly alter the relationship between stream flow and riparian vegetation. To significantly increase riparian vegetation, instream flow improvements from this or similar projects should be coupled with alternatives WP 42, 43, 45, 57 or 48.

Wildlife

Long-term/operational impacts

Implementation of this alternative may improve water flows for fish and other aquatic species. The degree of improvement would be dependent upon the nature and extent of specific programs. In areas where instream flows are currently low enough to affect spawning, rearing, and/or migration habitat of fish, increases in flows may have significant positive effects on fish production. In areas where water diversions have resulted in local or downstream migration barriers, restoration of stream flows could potentially reintroduce fish into habitat that was previously unavailable.

In some situations, increases in flow may also reduce stream temperature. Where stream temperatures currently exceed state water quality standards, decreases in temperature may improve production of cold-water fish species (for example, trout and salmon).

Scenic Resources and Aesthetics

Short-term impacts

Conservation programs would not likely affect scenic and aesthetic resources unless the program called for construction. In that case, a temporary or short-term visual impact may occur from the visibility of earth moving equipment and safety barriers associated with construction activities. In addition, vegetation removal may also occur causing some surficial scarring. The visual impacts would be primarily limited to the active construction site, with the potential for impacts at approach roads, staging areas, and storage areas. The location and size of the proposed construction would drive the degree of impact. In natural areas, the contrast of construction activities in an undisturbed area would be highly noticeable. However, in an urban or developed area, where other buildings and structures are common, the impacts would be minimal. In addition, if the construction area covers a large area such as replacing an entire distribution system, then a visual impact could occur. However, smaller projects such as replacing a single stretch of pipe, would only disturb the area minimally.

Long-term/operational impacts

Long-term adverse impacts on scenic and aesthetic resources would be considered significant if the proposed action altered the physical setting by introducing an unwanted visual contrast to the landscape that is noticeable to the public or would adversely affect a visitor's experience. As the proposed conservation programs are not expected to involve construction of permanent buildings or structures, then a significant adverse impact is not expected.

Environmental Health

Short-term impacts

Temporary construction-related safety impacts to workers and health impacts to the public could occur if construction activities (for example, pipe replacement, leak repair, and distribution system upgrades) are conducted as part of the implementation of this alternative.

Temporary increases in existing noise levels would occur during construction activities, such as the use of heavy equipment for excavation, soil transport, pipe delivery and laying, concrete forming and pouring, and use of other construction equipment. Maximum noise levels for general construction equipment generally range from 85 to 89 decibels (dBA) at 100 feet. This noise would be unavoidable and intermittent. Construction noise impacts would be greater in areas where construction occurs adjacent to residences. Excessive exposure to noise can cause hearing loss in workers, particularly if noise exposure exceeds 85 dBA as an 8-hour time-weighted average (Ecology 1996). In most areas, construction is exempt from noise ordinances, provided that construction activities are limited to specified hours and durations.

Unidentified or known hazardous substances may be encountered during excavation activities. Exposure to hazardous substances may result in health impacts to workers and area residents. The magnitude of potential impacts on public health is dependent on the toxicity and characteristics of the hazardous substances and the proximity of potential human receptors. Spills of fuel from construction vehicles may also occur.

Land and Shoreline Use

Long-term/operational impacts

Demand management programs may involve modification of water rate structures to encourage conservation. This could impose a proportionately larger burden on large, low-income families or small businesses with high water needs. Implementation of an inclining water rate structure may reduce water use, and thereby make additional waters available for beneficial uses such as recreation, instream use, or agriculture.

Cultural Resources

Short-term impacts

Construction projects associated with the development of this alternative may result in adverse impacts to cultural resources located in the vicinity of ground- or structure-disturbing actions. Archaeological resources can be adversely impacted by excavation or earthmoving to construct or install surface or subsurface features associated with this alternative. Architectural resources such as buildings, canals, dams, or other irrigation features can also be adversely impacted by the addition of new features to existing historic properties, and by demolition or removal of historic buildings, structures, or irrigation features. Adverse impacts to traditional resources are identified in consultation with Native American groups or other users. Traditional resource impacts can include changes in the flows or locations of traditional water resources, as well as effects to traditional sites, locations, and use areas.

Recreation

Short-term impacts

Recreation use and access may be temporarily disrupted as a result of construction activities related to municipal conservation programs. During construction, the site would presumably have limited access to construction-related personnel only. Once the project is completed though, recreation use would continue as before.

Transportation

Short-term impacts

Construction activities may result in additional traffic on roads near the construction areas, including trucks, heavy equipment, and worker vehicles. Numerous truck trips may be necessary to haul materials to the site or to dispose of waste materials. The number of construction-related trips as well as the frequency and duration of impacts is dependent on the location and magnitude of the project. If construction takes place adjacent to roads, disruption of traffic on these roads may occur. Delays or detours may be necessary, depending on the nature and location of the project, and may involve construction of temporary access roads. The degree of impact depends, in part, on the current level of service on potentially affected roads (that is roads at or above capacity would be more heavily impacted than roads that are substantially below capacity). In-water construction activities could impact marine transportation routes.

Any disruption caused by increased traffic during construction would be temporary and would occur over a relatively short period of time.

Public Services and Utilities

Short-term impacts

Implementation of demand reduction and operational efficiency measures may require additional public water system resources and could increase utility rates.

Ecology resources may be needed for processing changes in use/transfers if conservation and water use efficiency measures result in savings that make water available for other uses or for use in other locations.

Long-term/operational impacts

Some conservation program elements could require long-term commitments of resources by public water systems.

6.1.2 Mitigation Measures

Earth

Mitigation of soil erosion during construction activities that might be associated with this alternative would involve the development and implementation of adequate erosion and sediment control plans and stormwater management plans. These plans would specify site-specific measures for the minimization of soil erosion during construction activities.

Air

Air pollution control rules implemented by Ecology and/or the local air agencies would limit emissions of fugitive dust during construction activities unless they are controlled with best available control technologies. Some of the control measures include:

- Use of wetting agents in active areas that generate visible dust;
- Use of covers, wetting agents, or sealed load containers to prevent materials from escaping out of truck loads while on public roads;

- Cleaning techniques to prevent vehicles from tracking soil/particulate matter onto public roads;

- Stabilization of storage piles;

- Use of water sprays during material handling and transfer operations, such as those performed by a loader; and

- Surfacing dirt roads with gravel or pavement.

For construction activities occurring in or near ozone or carbon monoxide nonattainment or maintenance areas, consideration should be given to reducing emissions generated by construction equipment by application of one or more of the following equipment control measures:

- Use of heavy-duty diesel-powered construction equipment manufactured after 1996 (with federally mandated "clean" diesel engines) whenever feasible;

- Use of construction equipment with the minimum practical engine size;

- Use of efficient management practices to minimize the number of construction equipment operating simultaneously; and

- Maintenance of construction equipment in tune per the manufacturer's specifications.

Surface Water
Short-term effects on turbidity can be avoided or minimized by limiting the area that is disturbed during construction, applying suitable sediment control BMPs, and revegetating disturbed areas quickly.

Plants
Areas in which plants have been displaced should be revegetated with species native to the area, or consistent with management recommendations.

Scenic Resources and Aesthetics
Landscaping the disturbed area after construction could diminish any impact to scenic and aesthetic resources.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and workers include:

- Compliance with applicable local or state noise control ordinances;

- Maintaining mufflers in good repair, enclosing equipment within soundproofed enclosures, and using portable noise barriers, as applicable;

- Limiting construction to the hours between 7:00 am and 6:00 pm, Monday through Saturday, and between 9:00 am and 6:00 pm on Sundays; and

- Compliance with the Hearing Conservation Program of the Washington Department of Labor and Industries when noise exposure exceeds 85 dBA as an 8-hour time-weighted average. Potentially applicable program elements include exposure monitoring, hearing protection, baseline and annual audiometric testing, and employee training.

Potential mitigation measures to minimize impacts associated with hazardous substances include:

- Preparation of a health and safety plan to guide construction activities. The health and safety plan would include an evaluation of the proposed construction activities and identification of potential hazards, including contamination that may be encountered during construction. The plan would prescribe safe work practices, personal protective clothing, respiratory protection, emergency response procedures, and safety training requirements for construction workers. The need for site monitoring for detection of toxic or explosive conditions should also be addressed.

- Preparation of a hazardous substances corrective action plan for construction activities for any known site-specific hazardous substance removals or cleanup; this plan should address the activities required for cleanup of materials to meet Ecology requirements.

- Preparation of a spill response plan to address actions and notifications following a spill of fuel or other hazardous material used during construction.

Land and Shoreline Use

Potential mitigation measures include the implementation of programs to help subsidize water costs for low-income families or small businesses that may be adversely impacted by this alternative. In addition, early notification of water rate changes and available assistance programs would help to mitigate adverse impacts.

Any potential disproportionate impacts of modified rate structures on small businesses and low-income families could potentially be mitigated through development of rate structure exemptions or credits.

Cultural Resources

Mitigation measures for cultural resources should be identified in consultation with the Washington State Historic Preservation Office (SHPO). If impact avoidance through redesign is not possible, mitigation measures for construction impacts may include:

- Data recovery recording or excavation;

- Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation;

- Site monitoring; and

- Other measures identified in consultation with traditional user groups.

Recreation
Construction projects associated with this alternative should be timed to reduce impacts on recreational resources. For example, where fishing is a major recreational activity, construction could be timed to avoid the periods of out migration and spawning. Where construction would cause high turbidity in waters used for swimming or boating, construction activities should be timed to reduce visual impacts to swimmers or boaters.

Transportation
Potentially relevant mitigation measures include:

- Preparing a mitigation plan to ensure that appropriate traffic mitigation measures are implemented, maintained, and monitored;

- Improving the standard of local roads to act as alternate routes for increased volumes of traffic during construction;

- Restricting contractor and supplier site access to designated roadways;

- Identifying construction worker parking areas with sufficient capacity to prevent on-street parking, if construction occurs in urban areas;

- Designating locations for storage of construction equipment and materials;

- Detouring traffic onto local roads around the construction zones;

- Suspending construction during peak traffic hours on selected roads;

- Publicizing alternate transportation routes;

- Developing a construction plan which will ensure minimum disruption to street and pedestrian flow and safety during and after the project;

- Increasing signage along roadways to alert drivers of difficult driving conditions or inadequate infrastructure for loads; and

- Posting of a bond or other surety to ensure the repair of all damage to public property resulting from construction of the project.

6.1.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Emissions from construction activities associated with municipal conservation programs in combination with emissions from other approved projects in the same general region could exacerbate an existing nonattainment or maintenance status within an area. However, construction activities are temporary and intermittent in nature. Furthermore, implementation of the mitigation measures described in Section 6.1.2 would lessen these impacts to less than significant.

Scenic Resources and Aesthetics
Cumulative impacts to scenic and aesthetic resources could result from construction of multiple facilities in a given area through time. Significant unavoidable adverse impacts would need to be identified on a project-specific basis but are generally not expected.

Cultural Resources
Cumulative impacts to cultural resources may result from multiple construction actions in a given area through time. Significant unavoidable adverse impacts would need to be identified on a project-specific basis, but could occur as a result of the displacement of historic properties.

Recreation
Cumulative impacts to recreation resources could result from construction of multiple facilities in an area used for recreational activities. Significant unavoidable adverse impacts would need to be identified on a project-specific basis.

6.2 Alternative WP 2: Develop and implement agricultural water conservation and irrigation efficiency efforts through regional or irrigation district infrastructure improvements.

6.2.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, lining of canals, and installation of closed piping upgrades). These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term construction-related impacts are similar to those described in Section 6.1.1. In addition, projects involving lining or modifying canals have the potential to directly transport sediment that has accumulated in the canal during construction to streams. These sediment inputs would have the same effects on water quality that were described for Section 6.1.1.

Long-term/operational impacts

In most cases, water conservation and irrigation efficiency efforts will increase stream flows. This alternative may make more water available for instream flow and other beneficial uses. Secondary effects may include evaporative losses and ground water recharge associated with new or resized reservoirs, changes in the timing and location of ground water recharge through irrigation district expansion, and the potential for reduced recharge along any discontinued or lined irrigation facilities.

Increases in flow would have impacts on surface water quality similar to those described in Section 6.1.1. Additionally, reductions in return flow may reduce the inputs of nonpoint source pollutants associated with agricultural practices.

In situations where water is diverted and transported to a different subbasin, reductions in return flow could reduce stream flow in the originating subbasin. Reductions in stream flow have the potential to increase stream temperature. This potential may be significant in situations where a substantial portion of the flow is reduced.

Reductions in stream flow also have the potential to increase the concentration of other pollutants in a stream. This effect would tend to be offset by the reduction of inputs on nonpoint source pollutants unless a situation was present where pollutants of another source and type are present. The latter situation is likely rare but may occur in some locations. In this situation, reductions in flow would tend to increase the concentration, but not the load, of the pollutants input through other sources. The magnitude of effect would depend upon the current pollutant load, the expected post-project pollutant load, and the amount of reduction in stream flow arising from the reduction in return flow.

Ground Water

Long-term/operational impacts

Implementation of this alternative could decrease artificial recharge to ground water. Artificial ground water recharge caused by leakage from unlined irrigation canals or ditches may be reduced or eliminated should this alternative include lining of these structures. This could have the effect of locally lowering water tables and, in coastal areas, could possibly induce or increase seawater intrusion. The existence and magnitude of these impacts would depend on many factors, including the number and size of irrigation canals and ditches, the degree to which these structures are currently leaking, the amount and efficiency of new lining that may be installed, the depth to the water table, the underlying soil permeability, the amount of recharge from other sources, rates of ground water withdrawal, and the proximity to salt-water bodies.

Plants

Short-term impacts

Construction activities may displace plant communities at construction sites. Probable short-term impacts include soil disturbance from dozing and excavation that alter conditions for plant re-growth. Disturbance of soil may have more significant impacts on native species that are dependent on the specific chemical and nutrient composition in upper soil horizon. Trees and brush may also be cleared. The size of the affected disturbance depends on the magnitude of the project. Impacts would be considered greater to mature, diverse native plant communities supporting a variety of wildlife rather than disturbance to less diverse plant communities or patches of non-native vegetation or weedy species.

Long-term/operational impacts

If implementation of agriculture conservation measures results in controlling leakage of irrigation systems, then some existing wetlands that may have formed along the irrigation canals and ditches could experience reduced flows or may become dry. Similarly, riparian or other vegetation associated with leaky canals or ditches can also be dewatered by implementation of this alternative, resulting in reduction or loss of this plant life. Such changes may result in a shift in species composition toward non-wetland or more arid plant community types.

Wildlife

Short-term impacts

Noise and construction activities may deter or displace animals at construction sites. Soil and vegetation disturbance will alter habitat conditions and thereby alter wildlife use. The size of the affected disturbance depends on the magnitude of the project. Impacts would be considered greater to mature, diverse habitats supporting a variety of wildlife such as designated wildlife corridors, rather than disturbance to "roadside" habitats or those already affected by other land uses such as agriculture.

Long-term/operational impacts

Constructed operational sites may locally remove fish and wildlife habitat or modify conditions that alter species composition and wildlife use at or near the site. Broader effects on fish and wildlife are likely positive. Agricultural water conservation and irrigation efficiency projects tend to free up water. In some cases this water is used to fill junior downstream rights and/or to increase the number of irrigated acres. In such cases, no major change in stream flow would be expected. In other cases, however, water conservation and irrigation efficiency projects would result in increases to instream flow. Increases in stream flow would have the positive effects on fish habitat and fish productions described in Section 6.1.1. In areas where streams are currently dry or near dry, increases in flow would also provide additional water for terrestrial organisms.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from agricultural water conservation and irrigation efficiency efforts would be similar to those described in Section 6.1.1.

Environmental Health

Short-term impacts

Temporary and minor construction-related safety impacts to workers could occur if construction activities are conducted as part of the implementation of this alternative. Potential impacts are associated with increased noise levels and potential dust problems during operation of heavy machinery and other construction equipment. Minor spills of fuel or other hazardous substances may also occur. These impacts would be short-term and temporary.

No short-term adverse impacts to the public are expected to occur due to minor construction activities.

Should an agriculture conservation alternative be recommended for a large irrigation system, short-term and long-term impacts would be similar to those described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts

Conservation and efficiency measures, such as lining of irrigation ditches, may result in cost impacts to local irrigation districts. Over the short-term, these costs may need to be absorbed by the irrigation districts if grants or loans are unavailable.

Long-term/operational impacts

Costs associated with implementation of conservation and efficiency measures on a regional or irrigation district basis may require increases in irrigation assessments, rates, and fees. Depending on the level of success of agricultural water conservation and irrigation efficiency programs, additional waters may be made available for uses such as recreation, instream flow, agriculture, or other beneficial use. This could then result in indirect impacts associated with new development.

Cultural Resources

Short-term impacts

Short-term impacts would be similar to those described in Section 6.1.1.

Recreation

Short-term impacts

Short-term impacts from agricultural water conservation and irrigation efficiency efforts would be similar to those described in Section 6.1.1.

Transportation

Short-term impacts

Minor impacts to transportation systems may result from construction activities associated with this alternative as described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Conservation and efficiency measures, such as lining of irrigation ditches, will result in cost impacts to irrigation districts and conservation districts. Over the short-term, these costs will need to be absorbed by the irrigation districts.

Depending on the level of success of agricultural water conservation and irrigation efficiency programs, additional waters may be made available for beneficial uses such as recreation, instream use, and agriculture. Ecology resources may be needed for processing changes in use and transfers.

6.2.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2 for implementation of municipal conservation programs.

Surface Water

Short-term construction impacts on surface water quantity may be mitigated as described in Section 6.1.1. In addition, any re-design should maximize ditch/canal capacity to minimize surface disturbances. The geographic extent of changes in place of diversion and use should also be minimized.

Direct inputs of sediment resulting from construction within canals can be minimized by completing work "in the dry," attempting to clear canals of sediment prior to releasing water into them, and/or providing for sediment filtration of the initial water release. Other BMPs may also help reduce these sediment inputs.

Situations where projects would effectively reduce flow in a stream by reducing return flow should be carefully reviewed prior to implementation to ensure that the net effect of the project will be beneficial by meeting the objectives of the planning unit recommending implementation of this alternative.

Ground Water
Unacceptable lowering of ground water levels caused by lining irrigation canals and ditches could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to construction. In cases where such impacts would be likely, lining activities could be avoided or other measures, such as artificial recharge, could be considered.

Plants
Mitigation measures should include an evaluation for the presence of threatened, endangered, or sensitive plant species. If these species are found, the area should be avoided. If the project cannot be re-located to a less sensitive area, site-specific mitigation measures will need to be developed to reduce or prevent adverse impacts to the affected plants. Mitigation measures and BMPs may include minimizing the area of disturbance, reclaiming and revegetating disturbed areas with native plant species to the extent possible, and maintaining the areas replanted with native species until those species are well-established.

Wildlife
Mitigation measures should include an evaluation for the presence of threatened, endangered, or sensitive animal species or their habitats. If these species or their habitats are found, the area should be avoided. However, if the project cannot be relocated, proponents should identify and implement site-specific agency requirements for listed species to reduce or prevent adverse impacts to the affected species or habitat. One important mitigation measure would be to select a construction window to minimize disturbance to sensitive or listed species. Other BMPs include minimizing the area of disturbance, reclaiming and revegetating disturbed areas with native plant species to encourage recolonization by animal species. Construction of wildlife structures such as nest boxes may also be an appropriate mitigation option.

Another potential means to mitigate for potential impacts to wildlife could come from selection of alternatives that create additional terrestrial habitat. For example, rather than line an open ditch with an impermeable surface, planning units might select an alternative that results in enclosure of a ditch in pipe. Then the pipe could be buried, and the land reclaimed where the ditch previously existed. This alternative may also result in improvements to migration or movement of terrestrial species where a ditch previously acted as a barrier.

Scenic Resources and Aesthetics
Landscaping the disturbed area with native vegetation after construction could diminish any impact to scenic resources and aesthetics.

Environmental Health
Mitigation measures to reduce potential construction-related impacts are described in Section 6.1.2.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
If irrigation districts are able to market saved water through a water bank, they may be able to recoup a portion of the costs associated with water use efficiency improvements.

6.2.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
This alternative may result in permanent minor changes in timing of stream flow regimes. Water no longer diverted for agriculture use will have a positive to benefit to instream values by restoring the flow regimes in the stream to a more natural condition.

Some sediment inputs from construction within canals is likely unavoidable. The effects would tend to be very short in magnitude and duration, particularly if efforts are undertaken to minimize sediment inputs.

Ground Water
Lining irrigation ditches and repairing leaky conveyances across a region may lead to a reduction in ground water recharge. Reduced recharge to ground water could gradually increase the depth to the water table. Irrigation wells may have to be increased in depth or pumps lowered to compensate if the water table in an area were substantially lowered. The costs associated with well or pump lowering and additional head for pumps to pump against could be long-term cumulative impacts from implementation of this alternative.

Plants
Lands used for numerous infrastructure improvements such as pipelines or other related facilities may cumulatively remove and/or alter native plant communities and acreage designated for other land uses such as agriculture.

Wildlife
Lands used for numerous infrastructure improvements such as pipelines or other related facilities may cumulatively remove habitat for terrestrial biota.

Where multiple projects are built within a single basin, the cumulative effects of increases in stream flows could substantially improve fish habitat and fish production, particularly in areas where diversions currently have reduced stream flows to levels that do not support fish production or interfere with upstream migration.

Scenic Resources and Aesthetics

Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

Cultural Resources

Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation

Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Public Services and Utilities

Implementation of this alternative could involve significant commitment of financial resources by irrigation districts unless funding is provided by federal, state, and tribal resource agencies and entities.

6.3 Alternative WP 3: Develop and implement on-farm agricultural water conservation and irrigation efficiency efforts.

6.3.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, pond construction and distribution changes). These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as those described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts to surface water resources associated with any construction, including pond construction, are similar to those described in Section 6.2.1.

Long-term/operational impacts

Long-term impacts on surface water quantity may be associated with new or resized storage ponds, changes in the timing and location of ground water recharge locally through implementation of a more efficient irrigation method, and the potential for reduced recharge along any discontinued or lined irrigation facilities. Impacts described in Section 6.2.1 also apply to this alternative.

Ground Water

Long-term/operational impacts

Implementation of this alternative could decrease artificial ground water recharge from irrigation and thus lower water table elevations. Potential impacts would be similar to those described in Section 6.2.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts
The long-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts
The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts
The long-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Scenic Resources and Aesthetics

Short-term impacts
Short-term impacts from on-farm agricultural water conservation and irrigation efficiently efforts are similar to those described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts
Potentially significant costs may be associated with implementation of on-farm agricultural water conservation and irrigation efficiency methods such as drip irrigation, and storage ponds. Individual farm owners may be required to absorb these costs.

Cultural Resources

Short-term impacts
Short-term impacts would be similar to those described in Section 6.1.1.

Recreation

Short-term impacts
Short-term impacts from on-farm agricultural water conservation and irrigation efficiency efforts would be similar to those described in Section 6.1.1.

6.3.2 Mitigation Measures

Earth
Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air
Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Mitigation measures for short-term and long-term impacts to surface water are described in Section 6.2.2.

Ground Water
Mitigation measures for impacts to ground water from implementation of this alternative would be the same as those discussed in Section 6.2.2.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Scenic Resources and Aesthetics
Landscaping the disturbed area with native vegetation after construction could diminish any impact to scenic resources and aesthetics.

Land and Shoreline Use
Federal cost-sharing programs administered through the state and local conservation districts are available to assist farmers with the costs of conservation and pollution prevention through programs such as the Natural Resource Conservation Service's Environment Quality Incentives Program (EQIP) and Conservation Reserve Program (CRP). Potential mitigation measures include notification to farmers of the available programs. In addition, if farmers are allowed to market saved water through a water banking system, they may recoup part of the costs of improvements.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2.

6.3.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Cumulative impacts and significant unavoidable adverse impacts for this alternative are described in Section 6.2.3. In situations where this option was implemented widely across a watershed, the net effects on surface water quality are predicted to be positive.

Ground Water
Cumulative impacts to ground water resources associated with this alternative are predicted to be similar to those described in Section 6.2.3.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

6.4 Alternative WP 4: Develop and implement industrial conservation measures.

6.4.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, pond construction and distribution changes). These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts on surface water resources associated with any construction, including pond construction, are similar to those described in Section 6.2.1.

Long-term/operational impacts

Long-term impacts on surface water resources from this alternative are similar to those described in Section 6.2.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce withdrawals of ground water in those areas where ground water is used for industrial supply. Potential impacts would be the same as those described in Section 6.1.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1 for expanding industrial sites.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Industrial conservation measures would tend to increase the volume of water present in streams. In most cases, industrial withdrawals are not allowed to jeopardize instream flows for fish. Some older facilities, however, may withdraw enough water to compromise fish habitat.

Increases in flows, particularly in compromised habitats, would likely have positive impacts on fish similar to those described in Section 6.1.1, but may be less pronounced.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from conservation programs are anticipated to be similar to those described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts

Development and implementation of industrial conservation measures, such as in-process efficiency measures, may result in cost impacts to individual industries. The industries would need to absorb these short-term costs.

Long-term/operational impacts

Implementation of industrial conservation measures may have long-term impacts on the cost of production, potentially resulting in increased product price.

Cultural Resources

Short-term impacts

Short-term impacts would be similar to those described for alternative in Section 6.1.1.

Recreation

Short-term impacts

Short-term impacts from industrial water efficiency efforts would be similar to those described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

If industrial water use efficiency activities involve water reclamation and reuse, the Department of Health would need to issue permits for that portion of the activities.

6.4.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air
Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Mitigation measures for short-term and long-term impacts to surface water resources are described in Section 6.2.2.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Scenic Resources and Aesthetics
Landscaping the disturbed area with native species after construction could diminish any impact to scenic resources and aesthetics.

Land and Shoreline Use
Costs associated with implementation of water conservation measures are generally recovered in reduced water costs over time.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2.

6.4.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
In situations where this option was implemented widely across a watershed, the cumulative impacts on surface water are predicted to be positive.

Ground Water
The cumulative impacts associated with implementation of industrial water conservation programs across a region are predicted to be similar to those described in Section 6.2.3.

Plants
Implementation of industrial water conservation measures may result in a cumulative benefit by providing more water for natural wetland or riparian communities, or a cumulative impact by decreasing the availability of water to artificial wetland or riparian communities.

Wildlife
Operational efficiencies from implementing industrial water conservation measures within a major watershed or statewide may result in a positive cumulative impact to fish and riparian wildlife from additional water supply.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

6.5 Alternative WP 5: Construct and operate water reclamation and reuse facilities (reclamation plants and use areas) to provide water for beneficial uses.

6.5.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction of reclamation plants, conveyance systems, distribution systems, or recharge facilities. Temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Long-term/operational impacts

Long-term impacts to earth resources could involve the permanent removal of earth at reclamation plant sites and conveyance facilities. Reuse projects involving ground water recharge may raise local ground water levels, which could lead to bank instability and a long-term increase in erosion. In addition, if the reclamation facility is very large, its construction may require sand and gravel from borrow sites for use as fill. The magnitude of this potential impact would depend on the amount of earth resources required and on the local availability of these resources.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1. In addition, the water reclamation facilities may, at times, produce odors that would be a nuisance to persons living or working in the vicinity.

Surface Water

Short-term impacts

Short-term impacts on surface water associated with any construction are similar to those described in Section 6.2.1.

Long-term/operational impacts

Use of reclaimed water may reduce demand from stream flow sources thereby making more water available for instream flows or other beneficial uses. This is particularly true if the diversions and use occur within the same basin. Diversions for one use (for example domestic) may be treated then reapplied in the same basin for an additional use (for example irrigation) reducing the amount of water diverted; irrigation or industrial needs met by reclaimed municipal wastewater may reduce demand on existing supplies and/or defer the need for additional supplies.

Reclaimed water may also be used to directly or indirectly augment stream flow. Indirect augmentation may be achieved through recharging ground water with reclaimed water in areas where ground water supports streams during low flow periods.

In situations where a conventional wastewater treatment plant has historically discharged to a stream or river, diversion of part or all of the wastewater for reclamation and reuse may reduce flows in the receiving waters.

Ground Water

Long-term/operational impacts

Implementation of this alternative could result in additional ground water resources being available for withdrawal should the alternative involve artificially recharging ground water with reclaimed or reused water. However, these activities could potentially introduce contaminants into the ground water. The magnitude of these impacts would depend on factors such as the volume and quality of water reintroduced to the ground water, natural recharge, and ground water withdrawal patterns.

Artificial recharge of ground water may support stream base flows in areas where the receiving aquifer is in hydraulic continuity with surface waters.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Lands used for operation of facilities may permanently displace or modify vegetation by replacing plants with structures or by altering species composition, habitat type, size, and availability for waterfowl or upland species.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Lands used for operation of facilities may permanently displace or modify the local animal communities by displacing animals and their habitat with structures and may modify their species composition. This alternative may add water to streams and therefore, impacts may be similar to those described in Section 6.1.1.

Energy and Natural Resources

Short-term impacts

There are short-term impacts to energy and natural resources resulting from the construction of a major new treatment facility. Equipment used to excavate the site and to erect the facility consumes fuel. Electrical energy is also consumed during construction activities.

Long-term/operational impacts

All of the wastewater currently generated in a watershed, whether municipal or industrial, is already treated prior to discharge. Treatment processes for reclamation may require more energy than conventional wastewater treatment technology.

Reclaiming wastewater and reusing the treated water may reduce the demand for surface or ground water for irrigation purposes. Further, this reduction in demand could free up surface and ground water supplies for use in residential or industrial applications. This new growth may, in turn, place further demands on the surface and ground water resources from new development. This secondary growth could also produce the short-term construction related impacts described in Section 6.1.1.

Scenic Resources and Aesthetics

Short-term impacts

Stockpiling of materials, operation of equipment, development of staging areas, and construction of access roads would contrast with the surrounding landscape and cause a visual impact. These visual impacts would be limited to the active construction site. The location and size of the proposed construction would drive the degree of impact. In currently undeveloped areas, the contrast of construction activities in an undisturbed area would be highly noticeable. However, in an urban or developed area, where other buildings and structures are common, the impacts would be minimal. In addition, if the construction area covers a large area such as a water reclamation plant, then a visual impact could occur.

Instream construction may also temporarily increase water turbidity. Similar to above, in an area valued for its undeveloped appearance, turbidity may cause a visual impact. However, in streams where public use is limited or already shows turbidity, then the impact would be less noticeable. As turbidity caused from construction would only be temporary, a significant adverse impact is not expected in the short-term.

Long-term/operational impacts

Long-term impacts to scenic resources and aesthetics could occur as a result of constructing permanent buildings and structures. If the program involved building a permanent structure, then its location would need to be assessed for compatibility within the surrounding environment. For example, in an urban area where other buildings are prolific, an adverse impact would not be expected, as the reclamation facility would be located in an area where buildings dominate the viewshed. However, in an area valued for its natural scenic views, buildings and structures could potentially cause a visual disruption to the surrounding area.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers and the public could occur during construction of reclamation and reuse facilities. Potential short-term construction impacts are described in Section 6.1.1.

Long-term/operational impacts
Water reclamation and reuse facilities are required to comply with the Water Reclamation and Reuse Standards issues by Ecology and the Washington State Department of Health. These standards describe allowable beneficial uses, the required level of reclaimed water treatment appropriate for each beneficial use, and any specific statutory requirements.

Land and Shoreline Use

Short-term impacts
Siting of reclamation plants and associated facilities could result in short-term land use impacts. However, siting of these facilities would be required to be consistent with local comprehensive plans, zoning codes, shoreline master programs, and Critical Area Ordinances, as applicable.

Long-term/operational impacts
Potential beneficial impacts include a potential increase in wastewater treatment capacity that would support planned community growth. However, operation of water reclamation and reuse facilities must be consistent with the long-term land and water use planning objectives of the community it serves. Costs of construction and operation of water reclamation and reuse facilities may require an increase in sewer and or water utility rates.

Cultural Resources

Short-term impacts
Short-term impacts would be similar to those described in Section 6.1.1.

Recreation

Short-term impacts
Short-term impacts from water reclamation and reuse facilities would be similar to those described in Section 6.1.1.

Long-term/operational impacts
Long-term impacts to recreation are not predicted unless they involve a change in reclamation use areas that also provide recreation opportunities. For example, a change in water levels of a reservoir could change the opportunities and time available for recreation use. In addition, if the reclamation plant were constructed in an area currently used for recreation, then a change in use and access would occur potentially creating a significant localized adverse impact. Conversely, reclaimed water may be used to enhance recreational facilities by providing irrigation water for parks and golf courses.

Transportation

Short-term impacts
Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Implementation of this alternative would require that a sewer utility or municipality to commit significant resources to design and construct reclamation and reuse facilities. Additionally it would likely require Department of Health, Ecology, and local government resources for permitting.

Long-term/operational impacts

Reclamation plants may be more expensive to operate than more conventional forms of wastewater treatment and could potentially require increased utility rates.

6.5.2 Mitigation Measures

Earth

Mitigation measures for temporary construction-related impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

The potential long-term impact of erosion caused by decreased bank stability associated with high ground water levels from artificial recharge could be avoided through studies of local hydrogeologic conditions prior to design, followed by proper design and long-term monitoring of any recharge system.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2. In addition, the most effective mitigation strategy for preventing impact related to odor emissions would be to provide a sufficient distance, or a buffer zone, between a proposed reclamation facility and potential human receptors, as well as to properly design and operate the facility to minimize odor emissions.

Surface Water

Mitigation for short-term impacts to protect surface water quality is similar to that described in Section 6.2.2.

The long-term impacts of increased flow on surface water quantity and quality are likely positive. Use of reclaimed water within a basin is likely to make more water available for instream flow and/or other beneficial uses. Greater flows in streams may improve water quality parameters such as temperature and dissolved oxygen concentrations and reduce bacterial concentrations, assuming the reclaimed water meets the standards established by the Department of Health.

Ground Water

Proper design and operation of the facility should ensure adequate treatment that prevents contaminants from being introduced into the ground water, and ensure compliance with Department of Health established standards. Periodic monitoring of reclaimed water and ground water quality would ensure that contaminated water is not being introduced to ground water. For any site in which reclaimed water is used to recharge ground water, thorough hydrogeologic studies should be conducted to properly select the injection or recharge site and prevent problems such as slumping or bank instability.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Energy and Natural Resources
Consumption of energy and natural resources should be minimized by centrally locating treatment facilities to minimize pumping distances. Small treatment plants could be located near suitable sources of wastewater with on-site storage of the reclaimed water for local use.

Scenic Resources and Aesthetics
Landscaping the facilities after construction could diminish any impact to scenic resources and aesthetics, particularly if the exterior landscaping is designed to be compatible with the surrounding environment.

Environmental Health
Mitigation measures to reduce potential construction-related impacts are described in Section 6.1.2. Long-term/operational impacts may be mitigated by:

- Adherence to Department of Health Water Reclamation and Reuse Standards (Publication 97-23, September 1997), including requirements for water treatment and quality, monitoring, and setback distances.

- The requirement that all reclaimed water generation and use must be covered under a reclaimed water permit issued jointly by the Washington State Departments of Ecology and Health.

Land and Shoreline Use
Mitigation measures include compliance with applicable shoreline master programs, zoning codes, local comprehensive plans, and Critical Area Ordinances.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
Costs to municipalities or sewer districts associated with implementation of this alternative could potentially be offset to some degree by the availability of saved water to be put to another beneficial use or to be used to meet planned future growth.

6.5.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth
The use of earth resources such as sand and gravel from borrow sites for construction fill could result in cumulative impacts should numerous reuse or other water-related facilities be constructed within a single watershed.

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as those described in Section 6.1.3.

Surface Water
If the alternative were implemented extensively, net cumulative effects on surface water quantity and quality would be expected to be positive.

Ground Water
Assuming proper design and/or mitigation measures, no cumulative adverse impacts to ground water resources associated with this alternative would be predicted should it be implemented on a regional or statewide basis.

Plants
The cumulative impacts and significant unavoidable adverse impacts for this alternative are similar to those described in Section 6.2.3.

Wildlife
The cumulative impacts and significant unavoidable adverse impacts for this alternative are similar to those described in Section 6.2.3.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

6.6 Alternative WP 6: Promote greywater segregation and use in accordance with Department of Health standards.

6.6.1 Impacts

Surface Water

Short-term impacts

This alternative may result in temporary, construction-related impacts to surface waters such as increased sediment input. For instance, retrofitting plumbing fixtures and septic tank/drainfield design may have short-term construction impacts, but reduced demand may save on water withdrawn from the source. Laundry wastewater only systems for greywater disposal or reuse may require retrofitting of a smaller tank.

Long-term/operational impacts

Greywater systems used in conjunction with other conservation strategies, such as waterless toilets and subsurface drip systems for irrigation result in a lower demand for water. Promoting on-site greywater systems may increase stream flow, as less water would be withdrawn from an on-site well or nearby surface diversion. With a reduction in withdrawals, a corresponding reduction in return flows would also be expected. Changes in the timing of local recharge may result from this situation.

Greywater use may result in contaminants being introduced into surface waters. The degree of effect will be dependent upon the use and subsequent treatment of that water. Greywater used for irrigation purposes or other land application of water may runoff into streams, thereby increasing contaminant loads. The relative degree of the impacts would be dependent upon the amount of contaminants present in the greywater, the volume of water applied to the land, the distance from a stream where the water is applied, and the amount of filtration that occurs between the area of application and the stream. Greywater that is reused and subsequently treated will not have a significant effect on water quality.

Greywater use may also result in increased stream flows. The effects on increased flows on water quality are similar to those described in Section 6.1.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could result in introduction of contaminants should greywater be used to recharge ground water. Such recharge could also have the effect of increasing ground water levels. The magnitude of these impacts would depend on factors such as the volume and quality of water reintroduced to the ground water, natural recharge rates, and ground water withdrawal patterns as described in Section 6.2.1. Potential impacts associated with the release of contaminants are described below under environmental health.

Environmental Health

Long-term/operational impacts

Widespread use of greywater may pose a public health risk due to the potential presence of bacteria, viruses, other pathogens, and chemical contaminants. Although few viruses can survive for long in soil, viruses transported in water have been detected 30 feet from the source and may travel even further. The majority of health risks associated with use of greywater derive from enteric pathogens (for example, *Giardia* and *Cryptosporidium*) that may enter greywater from laundry or bathtub/shower water. An important study by the Los Angeles Office of Water Reclamation in 1992 monitored eight greywater re-use systems for a one-year period in the City of Los Angeles (Bennet 1995). The study concluded "the use of gray water at the pilot project sites did not pose a significant risk to the users or the community." The study found disease organisms were not present in greywater-irrigated areas, or in stored greywater. The report stated, "this may indicate either an entirely healthy test population (highly unlikely), or a mechanism for deactivation of pathogens." With the use of proper practices in accordance with Department of Health standards, application of greywater is predicted to result in minor impacts to public health.

Land and Shoreline Use

Short-term impacts

In high-density urban areas, application of greywater to individual yards may not be feasible due to the limited lot sizes in urban areas. However, this is a constraint rather than an impact.

Long-term impacts

Assuming that the use of greywater is compatible with local comprehensive plans, it may have the positive impact of reducing demand for wastewater treatment thereby creating capacity within the treatment plant.

Public Services and Utilities

Short-term impacts

Implementation of greywater use on a widespread basis may require significant local government resources (for example, local health jurisdictions) for permitting.

Long-term/operational impacts

Long-term operation may require additional resources for the local health jurisdiction and/or sponsoring sewer utility to conduct surface and ground water monitoring in areas where greywater systems are in widespread use.

6.6.2 Mitigation Measures

Surface Water

Mitigation measures for short-term impacts to surface water quantity are described in Section 6.1.2. No long-term adverse impacts to water quantity are predicted.

Enforcement of Department of Health standards in the land application of greywater should sufficiently mitigate potential impacts on surface water quality. Nevertheless, projects proposing the use of greywater for land application should be carefully reviewed to determine if additional mitigation, such as monitoring, is needed.

Ground Water
Potential impacts to ground water quality from the introduction of greywater could be minimized by implementing measures established by the Departments of Health and Ecology, and as described in Sections 6.2.2 and 6.5.2. Nevertheless, projects proposing the use of greywater for land application should be carefully reviewed to determine if additional mitigation, such as monitoring, is needed.

Environmental Health
Potential mitigation measures include:

- Use of greywater only where soil and site conditions meet the standard requirements for on-site sewage systems receiving combined wastewater;
- Application of greywater below the ground surface only, by using a drainfield or drip irrigation system;
- Use of greywater for irrigation of ornamental landscapes such as shrubs, trees, and flowers only (i.e., no irrigation of food crops using greywater);
- Storage of greywater in water tight tanks and piping, marked "GREYWATER IRRIGATION SYSTEM—DANGER—UNSAFE WATER";
- Compliance with the greywater system operation and maintenance manual; and
- Compliance with applicable Washington Department of Health and/or local health department regulations.

6.6.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

Environmental Health
Contaminants in greywater may contribute to overall anthropogenic levels of contaminants in the environment, particularly in soil and surface water. Potential cumulative and unavoidable adverse impacts to public health associated with this increase are predicted to be minor if activities are conducted in compliance with applicable standards.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as described in Section 6.1.3.

6.7 Alternative WP 7: Request Ecology to transfer existing water rights for out-of-stream beneficial uses acquired through purchase, lease, voluntary methods, or condemnation to other out-of-stream beneficial uses.

6.7.1 Impacts

Surface Water

Short-term impacts

There are no short-term impacts to surface water from this alternative unless there is a new surface water point of diversion. Even in this case, there would only be short-term construction impacts, such as temporary increase turbidity, if an intake/headgate structure were installed.

Long-term/operational impacts

Transfers of the beneficial use of existing out-of-stream water rights can involve a change in the water right holder, a change in point of diversion, or place of use. These types of transfers have the potential to adversely impact junior or senior water rights and intervening stream reaches.

By the nature of current water law, changes or transfers must maintain the integrity of the water balance. This requires that the transfer be limited to the consumptive portion of the right and that the return flow (or portion of the right that is relied upon by other water users) be left in the system and cannot be transferred. To satisfy these criteria, water right transfers or changes typically result in positive or no net changes in flow regimes. If impacts are associated with a transfer request, mitigation measures such as augmentation plans can be developed to avoid injury.

Transfer of water rights from one out-of-stream beneficial use to another may subsequently increase flows in some streams or reaches within a stream and decrease flows in other streams or stream reaches. The effects of increased stream flow are as described in Section 6.1.1. Decreased flows may result in increases in stream temperature and decreases in dissolved oxygen, particularly in situations where a substantial amount of flow is lost.

Changes in water quality may also occur through the change in beneficial use. The direction of change could be either positive or negative, depending upon the volume of pollutants input through the original and subsequent use. The magnitude of effect will depend upon the volume of water that is transferred between beneficial uses and the quantity of contaminants that are introduced through each use.

Ground Water

Long-term/operational impacts

Implementation of this alternative could affect ground water levels by changing the quantity and distribution of recharge. For example, recharge could be reduced should water use be changed from irrigation to domestic or municipal uses. The nature and magnitude of these potential impacts on ground water quantity and quality would depend on a number of factors, including the nature and location of the changes in water uses and the volume of water subject to the change.

Plants

Long-term/operational impacts

If water for irrigated lands is transferred to other beneficial uses, changes to plant species composition will likely occur. Wetland vegetation created by irrigation leakage may be reduced in its areal extent or may be eliminated, changing the plant composition along the ditches.

Wildlife

Long-term/operational impacts

A change in animal species composition may occur if the vegetative community is altered. This would occur where water is applied differently, such as removal or changes in irrigation practices.

Scenic Resources and Aesthetics

Long-term impacts

Changing the beneficial use from irrigation to domestic use may allow fields that were previously used for agriculture to go fallow. The fallow fields could provide habitat to birds and small animals. While some people would view an open field as potential habitat, others may feel that the area is unkempt and overgrown. Without some sort of weed control, fields could be invaded by weedy species. As part of the year, agricultural fields are often left unplowed and unkempt, fallow fields would not necessarily cause a significant adverse impact to visual resources. However, by applying mitigation measures, the fields could become part of a more natural-appearing landscape.

Land and Shoreline Use

Long-term/operational impacts

Transfer of water rights may result in changes in land use, both in the areas where the water rights originated (e.g., from agricultural to residential or commercial to industrial) and in the recipient areas (e.g., from one type of agriculture to another, such as from annual to perennial crops). These transfers may drive development in urban areas and may contribute to the transformation of farming communities to urbanized areas. In addition, an increase in fallow lands may result from the transfer of formerly irrigated agricultural lands to other land uses, such as municipal. Additional urban development may result in adverse impacts to water quality, plant and animal habitat, earth, air, energy/natural resources, scenic resources, and cultural resources.

Public Services and Utilities

Short-term impacts

Water right transfers and changes would need to be processed by Ecology and, potentially, by water conservancy boards in counties where such boards are in operation.

Long-term/operational impacts

If there is a transfer from an irrigation out-of-stream beneficial use to a domestic beneficial use, then demands on services may increase in the long term, as development increases.

6.7.2 Mitigation Measures

Surface Water

If impacts are associated with a transfer request, mitigation measures such as augmentation plans can be developed to avoid injury. The augmentation plan would describe methods for offsetting differences to consumptive use or return flow timing and magnitude incurred as part of the transfer.

There are numerous potential approaches to mitigating the long-term effects of transfers between uses on surface water quality. Mitigation would only be needed if the net effect on water quality is expected to be adverse. Projects involving transfer of existing water rights from one use to another should be carefully reviewed to determine the potential for site-specific adverse effects.

Ground Water

Unacceptable changes in ground water recharge patterns from implementation of this alternative could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to implementation of the changes. In cases where such impacts would be likely, changes in water use could be avoided or other measures, such as artificial recharge or withdrawal, could be considered.

Plants

Where lands are affected by re-directing water to different beneficial uses, lead agencies may need to determine site-specific impacts on plant communities and establish site-specific mitigation measures, depending on the volume of water transferred and the beneficial use to which it is transferred.

Wildlife

Where lands are affected by re-directing water to different beneficial uses, lead agencies may need to determine site-specific impacts on aquatic and wildlife communities and establish site-specific mitigation measures, depending on the volume of water transferred and the beneficial use to which it is transferred.

Scenic Resources and Aesthetics

Replanting the fields with native grasses and other vegetation to prevent noxious weeds from overtaking the area could create a landscape with more natural appearance.

Land and Shoreline Use

Potential mitigation measures include ensuring consistency of water rights transfers with local comprehensive plans, shoreline master programs, Growth Management Act, critical area ordinances, and other plans and codes, as applicable.

6.7.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

Implementation of this alternative may result in permanent reductions to stream flow in originating basins and increases in receiving basins. Unless mitigation efforts are implemented, implementation may affect valid water rights, particularly if transfers are based on former exempt well use. However, if appropriate mitigation measures are implemented for each transfer, cumulative impacts and significant unavoidable adverse impacts on surface water quality are unlikely.

Ground Water
Assuming proper mitigation measures are applied, no cumulative impacts to ground water resources associated with this alternative would be predicted should it be implemented on a regional or statewide basis.

Scenic Resources and Aesthetics
If numerous fields were allowed to go fallow, vistas could appear unkempt or weed dominated. Implementation of the mitigation measures described could return the area to a more natural looking landscape.

Land and Shoreline Use
While individual water rights transfers will not result in cumulative impacts to land use and shorelines, implementation of this alternative across Washington may lead to an increased level of urbanization statewide. Without adequate land use planning, increased urbanization may result in adverse impacts on water quality, habitat, earth, and other environmental media. Therefore, if implemented on a broad scale, this alternative may result in significant cumulative and unavoidable adverse impacts.

Public Services and Utilities
Processing of water rights transfers and changes would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans.

6.8 Alternative WP 8: Request Ecology to transfer existing water rights for out-of-stream beneficial uses acquired through purchase, lease, voluntary methods, or condemnation to instream beneficial uses through the state's Trust Water Right Program.

6.8.1 Impacts

Surface Water

Long-term/operational impacts

Similar to other transfers of water rights, the transfer of rights through the Trust Water Right Program has the ability to impact stream flows. The Trust Water Right Program is unique to Washington and is managed by the Department of Ecology. Water rights acquired by the state under the Trust Water Right Program (Chapter 90.42 Revised Code of Washington [RCW]) are to be managed by the state for the public benefit. The statute has the flexibility for several types of transfers including reallocation to either instream or out-of-stream uses (subject to certain limitations). Transfers of conserved water maintain the original priority date of the water right. This alternative addresses only transfers from out-of stream uses to instream uses and would therefore result in an increase in water availability in the streams. Transfers that involve an interbasin component would increase flows in one basin while decreasing flows in another basin. Secondary effects would include reduced ground water recharge along the geographic pathway associated with the original beneficial use.

Because stream flow may be increased under this alternative, there may be positive impacts of the increased flow on water quality, which are as described in Section 6.1.1.

Ground Water

Long-term/operational impacts

Water rights transfers may result in a decrease in ground water levels in areas where the previous beneficial use of the surface water involved ground water recharge (e.g., irrigation). Conversely, such transfers may result in increased ground water levels in areas where surface water recharges ground water (e.g., losing stream reaches, reservoirs) and where a transfer of water rights would result in increased surface water levels.

Plants

Long-term/operational impacts

If water is transferred to instream uses, the transfer would likely result in changes to vegetation on previously irrigated land and may eliminate some wetlands created by irrigation leakage. On the other hand, water transferred to instream uses may improve or expand existing riparian habitats.

Wildlife

Long-term/operational impacts

The long-term impacts to wildlife are predicted to be similar to those described in Section 6.1.1.

Energy and Natural Resources

Long-term/operational impacts

Transferring water rights back to instream uses would have a potential positive benefit to energy and natural resources. Specifically, more water instream would result in a higher generating capacity for hydroelectric facilities, thus placing additional power into the State's electrical grid.

Scenic Resources and Aesthetics

Long-term/operational impacts

As discussed in the section describing impacts to plants, a transfer of water for instream uses could alter the riparian vegetation. Some wetlands, which have developed along the stream banks, would be inundated and most likely be destroyed. The different types of vegetation and greater volume of water would initially change the viewshed of the waterway. However, over time riparian areas and wetlands would likely redevelop and improve.

Land and Shoreline Use

Long-term/operational impacts

Transfer of water rights may support changes in land use from out-of-stream uses (agriculture, municipal, industrial) to instream uses (recreational, habitat protection). This may negatively impact existing and/or future urban, industrial, and agricultural development. An increase in fallow lands may result from the transfer of formerly irrigated agricultural lands to instream uses; this may be perceived as a negative land use impact. At the same time, implementation of this alternative may result in beneficial long-term impacts to environmental media including water quality, air, and earth resources.

Cultural Resources

Long-term/operational impacts

Changes in stream flows may adversely impact streamside archaeological resources by erosion and inundation. Rising water levels and wave action can adversely affect archaeological resources by eroding the site. This can result in loss of context of artifacts and features, as well as artifact abrasion. At the same time, this alternative may restore flows in streams or reaches with traditional cultural significance, providing a beneficial effect.

Recreation

Long-term/operational impacts

Long-term impacts to recreation could occur with a change in water levels. Additional flows may promote water-related activities such as water-skiing and extend the boating season on reservoirs. However, high flows may discourage recreational activities particularly in rivers where float boating is popular. An increased river flow would discourage beginners, as an increased flow requires a more advanced level of expertise to float. A change in water levels on rivers occurs throughout the year, so changes in water levels are not predicted to create a significantly adverse impact.

Transportation

Long-term/operational impacts

The transfer of water rights to instream beneficial uses would result in increased water flow in streams, which could adversely impact the structural integrity of bridge supports and cause erosion of road shoulders.

Public Services and Utilities

Short-term impacts

Transfer of rights through the Trust Water Right Program would need to be processed by Ecology.

As noted in the narrative to Alternative WP 8 in Chapter 5.0, the processes described in Alternatives WP 7 and WP 8, and, potentially, Alternatives WP 9 and WP 10 could be combined and expanded to involve use of the Trust Water Rights Program in the development and operation of a water bank for both instream and out-of-stream uses. Should a water bank be a recommended action of a watershed plan, under provisions of Chapter 90.42 RCW, Ecology would need to develop a rule to establish the bank.

6.8.2 Mitigation Measures

Surface Water

Mitigation measures for this alternative are the same as those described in Section 6.7.2.

Ground Water

In cases in which decreased ground water levels could lead to undesirable effects, such as water supply wells going dry, a number of mitigation measures could be applied. For example, the water supply wells could be drilled deeper, or existing pumps could be set deeper in the well. Alternatively, the users of impacted wells could be supplied with alternate sources of water (for example, they could be hooked up to a nearby municipal system). In addition, artificial recharge could be implemented to offset declining water levels. Mitigation should be premised on appropriate hydrogeological studies to predict any adverse effects prior to implementation of the changes.

Plants

Project proponents should minimize disturbance to those wetlands formed through irrigation channels or leakage that function as important wildlife corridors if existing water quantities are significantly altered. Alternatively, proponents could construct additional wetlands to mitigate for loss or degradation of wetlands resulting from the reallocation of water.

Land and Shoreline Use

Potential mitigation measures are described in Section 6.7.2.

Cultural Resources

Mitigation measures for long-term operational impacts may include measures such as site stabilization measures.

Recreation
Different access points could be designed and provided to allow boaters to put in and take out at areas where less-advanced levels of expertise are required.

Transportation
Potential mitigation measures include preparation of a mitigation plan to identify the procedures to be undertaken to ensure the structural integrity of roads and bridges along and adjacent to the affected streams. Site stabilization measures could be implemented to minimize erosion effects.

6.8.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use
While individual water rights transfers will not result in cumulative impacts to land use and shorelines, implementation of this alternative across Washington may lead to changes in land use patterns statewide. Because these transfers are from out-of-stream to instream uses, they may negatively impact existing or future urban, agricultural, or industrial development. Therefore, if implemented in broad areas across the state, this alternative may potentially result in cumulative and significant unavoidable adverse impacts to land and shoreline use.

Cultural Resources
Significant unavoidable adverse impacts to archaeological resources may result from erosion and inundation of resources.

Recreation
Water transferred throughout the state for beneficial uses could create a surplus of instream water. Additional water flowing through streams could create beneficial impacts to recreation by creating different opportunities such as swimming, fishing, and boating.

Transportation
Unavoidable adverse impacts include the cost of implementing erosion control measures and bridge/road modifications to ensure structural integrity. Statewide, this impact could be significant.

Public Services and Utilities
Processing transfers of water rights through the Trust Water Right Program would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans.

6.9 Alternative WP 9: Transfer water through interties of public water systems or irrigation systems.

6.9.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, construction of new intertie systems). These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts of this alternative on surface water are as described in Section 6.2.1.

Long-term/operational impacts

Municipal interties constitute a form of water transfer among municipalities (authorized in RCW 90.03.383). Ecology has the authority to amend water utilities water rights if proposed interties meet the following legislatively mandated criteria: improve overall system reliability, enhance the manageability of the systems, provide opportunities for conjunctive use, or delay or avoid the need to develop new water sources.

Ground Water

Long-term/operational impacts

Implementation of this alternative could change the quantity and distribution of recharge and withdrawals within and between basins (should interties involve more than one basin). For example, recharge could be reduced should water use change from irrigation to municipal uses. The nature and magnitude of these potential impacts would depend on a number of factors, including the nature and location of the changes in water uses and the volume of water subject to the change.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1 if new interties are constructed.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1, if new interties are constructed.

Long-term/operational impacts

If an open water channel or other conveyance system is replaced with pipelines, then wildlife use of the open system will be lost.

Energy and Natural Resources

Short-term impacts

There are short-term impacts to energy and natural resources resulting from the construction of pipelines. Equipment used to excavate the pipeline route consumes diesel fuel. Sand and gravel may be consumed in the construction of the intertie project if the pipeline is very long (for example, more than 10 miles long).

Long-term/operational impacts

The only anticipated long-term impact is the consumption of electrical energy, where applicable, to operate any additional pumps needed to transfer water between the different systems.

Scenic Resources and Aesthetics

Long-term/operational impacts

Long-term impacts to scenic resources and aesthetics may result from reduced stream flows as a result of transferring water from one basin or subbasin to another, but would likely be minimal. Stream flows and basin water levels increase and decrease regularly during the year as a result of the change in seasons and stormwater events. As the viewshed of the river or basin changes over the year, it is unlikely that a change in the amount of water that fluctuates regularly would be noticed.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers could occur if construction activities are conducted as part of the implementation of this alternative. Construction-related impacts are discussed in Sections 6.1.1 (for major construction efforts) and 6.2.1 (for minor construction efforts).

Long-term/operational impacts

If interties are constructed near residences, potential long-term adverse noise impacts could result due to operation of pumps used to transfer water between the different systems.

Land and Shoreline Use

Long-term/operational impacts

Transfer of water through interties may promote changes in land use (for example, residential/ industrial to agricultural or agricultural to residential/industrial). In addition to the potential long-term land use impacts described in Section 6.7.1, construction of interties may result in additional urban development in locations to which water is exported. Additional urban development may result in adverse impacts to water quality, plant and animal habitat, earth, air, energy/natural resources, scenic resources, and cultural resources.

Cultural Resources

Short-term impacts

Short-term impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Adverse impacts may result from the transfer of water through interties of water systems if the transfers alter the flow regime of streams with cultural significance for traditional users. Reduced stream flows can impact traditional fisheries and can affect the use of traditional sacred areas.

Recreation

Long-term/operational impacts

Long-term impacts to recreation could occur with a change in water levels. Lower levels in the donating watershed may decrease or shorten the boating season on reservoirs. Boat ramps and docks could become unavailable earlier each season. Because changes in water levels on rivers occur throughout the year, changes in water levels due to implementation of this alternative are not anticipated to create a significantly adverse impact.

Transportation

Short-term impacts

Temporary, construction-related impacts are described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Utilities or irrigation districts involved in development of interties would need to establish a mechanism for financing the capital improvements. However, once in operation, user fees should offset the initial capital costs.

Water right changes necessary to implement interties would need to be processed by Ecology.

6.9.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as those described in Section 6.1.2.

Surface Water
Measures to mitigate impacts to surface water quantity are the same as described in Section 6.7.2.

Projects completed under this alternative may have both positive and negative effects on water quality. Proposed projects should be carefully reviewed to determine the net effect of increases and decreases in flow on water quality before being implemented. Mitigation of effects will be project-specific and should be identified during project review.

Ground Water
Potential impacts to ground water from implementation of this alternative could be mitigated using measures described in Section 6.7.2.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Energy and Natural Resources
Project designers should evaluate all potential systems for interties to minimize the number of new pipelines constructed. The construction-related impacts increase in proportion to the number of interties built. In order to maximize the effectiveness of the interties and to minimize the number of interties, each jurisdiction must look for a regional solution. This may require cross-ties with adjacent water districts rather than staying within a given water district. Evaluating regional alternatives should identify a solution that will reduce the length of new pipeline constructed with the attendant impacts.

Scenic Resources and Aesthetics
Landscaping disturbed areas after construction or long-term drop in water levels could diminish any impact to scenic resources and aesthetics.

Environmental Health
Mitigation measures for temporary, construction-related impacts are identified in Section 6.1.2.

Land and Shoreline Use
Potential mitigation measures are described in Section 6.7.2.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2. In addition, mitigation measures for traditional resources would be identified in consultation with the appropriate Native American or other traditional users. Such measures could include maintaining minimum stream flows during certain seasons.

Recreation
Existing structures could be modified to allow continued recreational use. For example, if the boating season is shortened, a boat ramp may have to be lengthened to allow for continued use when water levels are lower.

Transportation
Mitigation measures for temporary, construction-related impacts are identified in Section 6.1.2.

6.9.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Implementation of this alternative may result in permanent minor changes to timing (locally) of stream flow regime or may result in permanent reductions to stream flow in originating subbasins and increases in receiving subbasins.

Cumulative impacts on surface water quality are possible if multiple projects are implemented in a local area (within a basin or within adjacent basins). All projects should be reviewed in light of other projects affecting stream flow to evaluate the potential cumulative effects.

Ground Water
There may be cumulative impacts in watersheds within which ground water is transferred from one area to another through an intertie. Ground water levels may be reduced in the donating area, but may increase in the receiving area due to irrigation, residential outdoor water use, and on-site sewage system use. If the receiving area is characterized by urban development and is sewered, the effects on recharge will likely be negligible.

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts are discussed in Section 6.7.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts could occur if water levels in reservoirs were raised or lowered as a result of implementation of this alternative. Recreation activities would need to be assessed on a project-to-project basis.

Public Services and Utilities
Properly designed, the implementation of interties would increase the reliability of water deliveries on a regional basis and can provide greater flexibility in managing deliveries under drought conditions or situations where water quality is locally impaired.

Processing water rights changes for interties would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans.

6.10 Alternative WP 10: Request Ecology to allocate additional ground or surface water on a short-term or long-term basis.

6.10.1 Impacts

Surface Water

Short-term impacts

Short-term additional allocations of water may reduce surface water flows. Reductions in flows may result in short-term increases in water temperature if the reduction in flow is substantial. The significance of the temperature increase would be dependent upon the magnitude of change relative to existing water quality standards.

Long-term/operational impacts

Long-term surface water allocation of water may permanently reduce surface water flows. Depending on the beneficial use and place of use, return flows would return a portion of the water withdrawn (in-basin return flows would be beneficial). If return flows also occurred out of a basin (for example, wastewater exported to a regional plant), the additional water allocated may constitute a net loss to the basin.

Reductions in flows may result in long-term increases in water temperature if the reduction in flow is substantial. The significance of the temperature increase would be dependent upon the magnitude of change relative to existing water quality standards.

Long-term surface water allocations may also reduce lake or reservoir levels. The effect of changes in water level in lakes and reservoirs is complex and depends upon the flushing rates of the water body, the nutrient levels in the lake or reservoir, and the depth of the water body, among other factors. Reservoirs or lakes that are deep and that have a high flushing rate may experience insignificant changes in water quality. Lakes that are shallow and/or have low flushing rates may undergo a number of adverse changes in water quality if water depth is decreased, particularly if that water body also has a high nutrient load. In the worse case scenario, the affected water body could undergo significant eutrophication if water levels were substantially reduced.

Long-term ground water allocation of water may permanently reduce aquifer levels with subsequent reductions in surface water flow in the form of seeps and springs. Reductions in ground water inputs to streams may reduce stream depth and can also reduce the local cooling effect of ground water inputs on stream temperature.

Ground Water

Long-term/operational impacts

Implementation of this alternative could cause reductions in ground water levels due to increased withdrawal. The magnitude of these impacts depends on the volume of additional ground water that would be allocated, the nature of the aquifer(s), and the amount and pattern of recharge and withdrawal.

Plants

Long-term/operational impacts

Longer-term reallocation from one use to another that increase surface flows may result in altered riparian community and function due to changing water levels. Impacts may include expansion, reduction, or stranding of existing riparian zones, thereby affecting plant community composition.

Wildlife

Short-term impacts

Temporarily increased surface water diversions may have a short-term adverse impact on aquatic and fish habitat by reducing stream flows and thereby reducing aquatic habitat.

Long-term/operational impacts

Longer-term reallocations that decrease surface flows may result in an altered riparian community and function due to changing water levels. Impacts may include expansion or reduction of existing riparian zones, thereby altering terrestrial wildlife habitat. Decreased flow may also adversely impact aquatic community composition, depending on the magnitude and timing of the diminished flows.

Scenic Resources and Aesthetics

Short-term impacts

Reduced surface water flow may have a short-term adverse impact on scenic resources and aesthetics. The contrast caused by the vegetated/non-vegetated interface may cause an observed scarring effect on the land. This scarring of the banks from a reduced water level would be visible to visitors. However, as many reservoirs experience a drop in water levels throughout the year, the scarring would not necessarily be unexpected, thereby decreasing the level of impact.

Long-term/operational impacts

Reduced surface water flow may have a long-term adverse impact on scenic resources and aesthetics. Scarring of the banks from a reduced water level would be visible to visitors. If the water level remained at a lower level throughout the year, then the land scarring caused from changes in water level would continue to impact scenic resources and aesthetics as opposed to the intermittent fluctuations as experienced in most reservoirs.

Land and Shoreline Use

Long-term/operational impacts

Allocation of additional ground water or surface water by Ecology may support expansion of existing land uses or promote new land uses. Potential long-term impacts on land and shoreline use are described in Section 6.7.1.

Cultural Resources

Long-term/operational impacts

Adverse impacts may result from allocating ground or surface water on a short or long-term basis if the allocations alter the flow regime of streams with cultural significance for traditional users. Reduced stream flows can impact traditional fisheries and can affect the use of traditional sacred areas.

Recreation

Short-term impacts

Short-term impacts to recreation could occur with any significant change in water levels. Lower levels may decrease or shorten the boating season on reservoirs. Boat ramps and docks could become unavailable earlier in the season.

Long-term/operational impacts

Long-term impacts to recreation could occur with a change in water levels. Lower levels may decrease or shorten the boating season on reservoirs. Boat ramps and docks could become unavailable earlier each season.

Public Services and Utilities

Short-term impacts

Ecology would need to process water right applications and permits for additional appropriations.

6.10.2 Mitigation Measures

Surface Water

The effects of water allocations on the water quantity of streams, lakes, and reservoirs can potentially be substantial. Mitigation of potential effects can be achieved through careful evaluation of the effects of the additional allocations and through limiting both the instantaneous withdrawal rate and total allowable seasonal volume at levels that will avoid or minimize adverse effects. The area of disturbance, the geographic extent of changes in point of diversion and use, out-of-basin transfers, and the amount of flow diverted should all be minimized.

In evaluating applications for appropriations, Ecology may consider proposals for mitigation. Ideally, mitigation would involve in place, in kind, in time replacement of flows. Other proposals for flow replacement can be considered; however, more evaluation would likely be necessary to determine whether the proposal would adequately mitigate the impacts associated with the appropriation. Habitat replacement is another form of mitigation that could be proposed. Evaluation of a habitat replacement proposal would need to demonstrate that, from an ecological standpoint, the value of the habitat replacement would be equal to or greater than the value of the flow being appropriated. Mitigation could also involve a combination of replacement flows and habitat replacement.

Ground Water

Unacceptable lowering of ground water levels caused by increased allocation could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to implementing the changes. In cases where such impacts would be likely, allocations could be adjusted or avoided.

Plants
Proponents should minimize significant alteration of water quantity or flows out of water bodies so as not to disrupt riparian function or significantly alter species composition.

Wildlife
Proponents should minimize significant alteration of water quantity or flow regimes out of water bodies so as not to substantially alter species composition or disrupt aquatic life.

Scenic Resources and Aesthetics
If water levels remained at a lowered level, then vegetation could be planted or the area seeded with native grasses to decrease the visual contrast between water and land.

Land and Shoreline Use
Potential mitigation measures are described in Section 6.7.2.

Cultural Resources
Mitigation measures for traditional resources would be identified in consultation with the appropriate Native American or other traditional users. Such measures could include maintaining minimum stream flows during certain seasons.

Recreation
Recreation amenities such as boat docks and ramps may have to be moved or reconstructed to account for the lowered water levels.

6.10.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Cumulative and significant unavoidable adverse impacts from implementation of this alternative could include permanent reduction in stream flows in a basin.
The cumulative impacts of multiple allocations of water have the potential to result in significant water quality effects. This is of particular concern for large water bodies. Several projects that individually have no effect on a large water body may cumulatively reduce water levels to a point where significant changes in the water chemistry are triggered. Cumulative effects should be given close consideration in areas where multiple allocations are considered.

Ground Water
Cumulative impacts to ground water levels could occur should multiple basins or subbasins over-allocate ground water resources.

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts are discussed in Section 6.7.3 above.

Public Services and Utilities
Processing water right applications and permits for additional appropriations would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans.

6.11 Alternative WP 11: Request Ecology to adopt a rule to close or partially close a basin or subbasin.

6.11.1 Impacts

Surface Water

Long-term/operational impacts

Closing or partially closing a basin to further withdrawals, as suggested in this alternative, may eliminate further reductions to stream flows, or lake or reservoir levels.

This alternative would not be expected to affect current water quality but would help to avoid future degradation of water quality associated with additional withdrawals. The potential effect of additional withdrawals is described in Section 6.10.1.

Wildlife

Long-term/operational impacts

This alternative may protect existing water flows for fish and other aquatic organisms.

Scenic Resources and Aesthetics

Long-term impacts

Existing scenic resources and aesthetics are likely to be maintained under this alternative, as it does not involve activities that would affect these resources, such as construction.

Land and Shoreline Use

Long-term/operational impacts

Closing or partially closing a basin or subbasin would likely restrict additional development in that area. Affected local jurisdictions may need to modify comprehensive plans and, where applicable, modify Urban Growth Area boundaries if closure or partial closure of a basin or subbasin has an adverse impact on water availability for planned future growth.

Public Services and Utilities

Short-term impacts

Ecology, after consultation with the standing Washington State Senate and Washington State House of Representatives committees having jurisdiction over water resources, would need to undertake rule making consistent with the provisions of the Administrative Procedures Act (Chapter 34.05 RCW) and the rule making administrative code (Chapter 1-21 WAC).

6.11.2 Mitigation Measures

Land and Shoreline Use

Potential negative impacts of this alternative (i.e., reduced availability of water) could be mitigated by the implementation of conservation and water use efficiency measures by affected governmental entities. In addition, water purveyors could adopt a market-driven cost structure for water allocation to encourage conservation and efficient use of the resource.

6.11.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

Implementation of this alternative in multiple watersheds could reduce development on a statewide scale, thereby leading to negative impacts on the state's economy. Therefore, this alternative could result in cumulative and significant unavoidable adverse impacts.

Public Services and Utilities

Development of rules to close or partially close basins would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans.

6.12 Alternative WP 12: Request Ecology to initiate an adjudication of a basin or subbasin.

6.12.1 Impacts

Surface Water

Long-term/operational impacts

The overall result of adjudication may be a reduction in allocated water particularly if numerous rights are relinquished for non-use. In other situations, the overall result may be an increase in allocated water due to validation of claims and federally reserved rights. For real impacts to occur, enforcement of the outcome may have to occur. The real impacts or benefits will have to be determined by analysis on a case-by-case basis and cannot be addressed in this document. If enforcement occurs, illegal use of water may cease resulting in enhanced stream flow. If water right holders start using water that has not been used to show due diligence and beneficial use prior to adjudication, stream flow reductions may occur. In some areas, flows may increase while in others they may decrease. The effects of variably increasing and decreasing flows on surface water quality are described in Section 6.9.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could affect the quantity and distribution of ground water withdrawals, depending on the outcome of the adjudication(s). The nature and magnitude of these potential impacts would depend on a number of factors, including the nature and location of the changes in water uses and the volume of water subject to the change.

Wildlife

Long-term/operational impacts

The long-term impacts on fish and wildlife as a result of implementing this alternative are predicted to be similar to those described in Section 6.1.1 if water is returned to streams. However, if more water from streams is used, as described in impacts to surface water above, impacts to aquatic biota are predicted to be similar to those described in Section 6.10.1.

Land and Shoreline Use

Long-term/operational impacts

Adjudication of a basin or subbasin may reduce the volume of water available to support existing and future land use activities within the basin in which adjudication decisions are implemented. For example, a farmer who loses water due to the adjudication may need to reduce or eliminate the irrigation water used for all or a portion of crop needs. The farmer may need to change cropping plans to grow those with lower water requirements or possibly change to an alternate crop.

Public Services and Utilities

Short-term impacts

Ecology would need to seek a funding appropriation from the state legislature to support the adjudication process. Adjudications are typically labor intensive involving both Ecology and jurisdictional superior court staff.

Long-term/operational impacts

Complex adjudications, especially adjudication of whole basins, can represent protracted efforts. For example, the Yakima River basin adjudication process began in 1977 and has been ongoing for 25 years. Adjudication of discrete portions of a basin would typically be of much shorter duration.

6.12.2 Mitigation Measures

Surface Water

The potential impacts of this alternative are generally positive. However, care should be taken to minimize the geographic extent of changes in place of diversion and use to reduce impacts on surface water quantity.

The potential impacts of this alternative on surface water quality can be mitigated through careful review of the adjudication plan as it affects water quality. Measures incorporated into the plan to avoid excessive reductions in flows may offset water quality effects.

Ground Water

Potential unacceptable changes in the distribution of ground water withdrawals could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to implementing the changes. In cases where such impacts would be likely, allocation changes may be able to be adjusted or avoided.

Land and Shoreline Use

Early in the adjudication decision-implementation process, Ecology could work with the affected parties to identify land uses or crops compatible with the decision.

6.12.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

Depending on adjudication decisions, there may be a permanent reduction or increase in stream flows.

Ground Water

Depending on adjudication decisions, there may be a permanent reduction or increase in ground water levels.

Land and Shoreline Use

Depending on the adjudication decisions, existing out-of-stream uses could be curtailed.

Public Services and Utilities

Adjudication of basins or subbasins would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans. Additionally, since adjudications are generally quite costly to administer, conducting several adjudications within the same general time frame would place a significant burden on Ecology and the state's financial resources.

6.13 Alternative WP 13: Request Ecology to assign a watermaster to a basin, subbasin, or other geographic area.

6.13.1 Impacts

Surface Water

Long-term/operational impacts

Efficiency gained through increased knowledge and enforcement may increase stream flows by curtailment of illegal water usage, identification of priority areas for water conservation measures, and collection of additional information for active management of the water rights by seniority (for example, junior users denied water for specific periods during dry years).

This alternative may ensure compliance with existing water rights and thereby increase stream flows. The effects of increased stream flows on surface water quality are discussed in Section 6.1.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could have the impact of increasing ground water levels should the assignment of a watermaster increase compliance with existing water rights for ground water withdrawals. The magnitude of this impact would depend on the degree to which existing ground water withdrawals exceed approved water rights, the degree to which assignment of a watermaster would increase compliance, the quantity and distribution of ground water withdrawals, and physical factors such as local recharge, depth to ground water, and aquifer properties.

Plants

Long-term/operational impacts

Long-term impacts to plant communities are predicted to be similar to those described in Section 6.8.1.

Wildlife

Long-term/operational impacts

The long-term impacts on fish and wildlife as a result of implementing this alternative are predicted to be positive and are similar to those described in Section 6.1.1.

Land and Shoreline Use

Long-term/operational impacts

Assignment of a watermaster to a basin may increase enforcement against illegal water use within that basin. This could result in curtailment of existing land uses that are dependent on the illegal use identified by the watermaster. Subsequent enforcement may make additional water available for beneficial uses. For example, a farmer illegally using water may be growing crops that require substantial irrigation. Under this alternative, this farmer may need to change to a different crop with lower water requirements or to a different land use. Implementation of this alternative may also result in curtailment of existing land uses that currently have the use of water.

Public Services and Utilities

Long-term/operational impacts

Implementation of this alternative would require Ecology to expend resources to hire and maintain a watermaster.

6.13.2 Mitigation Measures

Surface Water

The effects of the alternative on surface water quality and quantity are likely to be positive, hence no mitigation is needed.

Ground Water

The effects of the alternative on ground water quantity and quality are likely to be positive, hence no mitigation is needed.

Plants

Mitigation measures for long-term impacts to plant communities are described in Section 6.8.2.

Land and Shoreline Use

As watermasters identify and take enforcement actions to ensure water rights are appropriately used, Ecology could work with the affected parties to identify conservation methods, land uses, or crops compatible with legally available water.

6.13.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

If watermasters identify and take enforcement action against multiple water users within a basin or region, there may be cumulative impacts in changing land use patterns as existing water uses are prohibited or limited.

Public Services and Utilities

Assignment of a watermaster would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans, potentially including assignment of watermasters for other basins or subbasins.

6.14 Alternative WP 14: Request Ecology to increase enforcement against illegal water use within a basin or subbasin.

6.14.1 Impacts

Surface Water

Long-term/operational impacts

Long-term impacts from this alternative are anticipated to be the same as for this alternative as those described in Section 6.13.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could have the effect of increasing ground water levels should increased enforcement decrease illegal ground water withdrawals. The magnitude of this impact would depend on the amount of illegal ground water withdrawal, the degree to which increased enforcement would decrease illegal use, the quantity and distribution of ground water withdrawals, and physical factors such as local recharge, depth to ground water, and aquifer properties.

Wildlife

Long-term/operational impacts

Assuming relinquishment of previously used water posed a threat to existing aquatic resources, increased instream flows may provide additional habitat for fish and other aquatic life.

Land and Shoreline Use

Long-term/operational impacts

Increased enforcement against illegal water use within a basin or subbasin may result in impacts similar to those described in Section 6.13.1.

Public Services and Utilities

Short-term impacts

Implementation of this alternative would require Ecology to assign resources for enforcement. If the number of water users within that area to be addressed is relatively large, resource impacts to Ecology may be significant.

6.14.2 Mitigation Measures

Surface Water

The effects of this alternative on surface water resources are likely to be positive, hence no mitigation is needed.

Ground Water

The effects of this alternative on ground water resources are likely to be positive, hence no mitigation is needed.

6.14.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

If enforcement actions are taken against multiple water users within a basin or region, there may be cumulative impacts in changing land use patterns as existing water uses are prohibited or limited.

Public Services and Utilities

Undertaking enforcement against illegal water users in a basin or subbasin would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans, potentially including request for enforcement in other basins or subbasins.

6.15 Alternative WP 15: Request Ecology to evaluate some set or subset of existing water rights within a basin or subbasin to identify those that are subject to relinquishment.

6.15.1 Impacts

Surface Water

Long-term/operational impacts

Relinquished rights may result in lower amounts of "allocated water" which may or may not translate into "real" changes in future stream flow. Accounting more accurately for the allocated water may allow for future allocations of real water where it may be needed most.

Ground Water

Long-term/operational impacts

Implementation of this alternative could have the effect of increasing ground water levels should the reevaluation of water rights lead to reduction of current ground water withdrawals if followed by enforcement. The magnitude of this impact would depend on the degree to which existing ground water withdrawals would be reduced, the quantity and distribution of ground water withdrawals, and physical factors such as local recharge, depth to ground water, and aquifer properties.

Plants

Long-term/operational impacts

Long-term impacts to plant communities are predicted to be similar to those described in Section 6.8.1.

Wildlife

Long-term/operational impacts

The long-term impacts on fish and wildlife as a result of implementing this alternative are predicted to be similar to those described in Section 6.11.1.

Public Services and Utilities

Short-term impacts

Implementation of this alternative would require Ecology to assign resources to identify and evaluate water rights that are subject to relinquishment and to conduct enforcement activities. Depending on the number of water rights to be addressed, this may result in significant impacts to Ecology resources.

6.15.2 Mitigation Measures

Plants

Mitigation measures for long-term impacts to plant communities are described in Section 6.8.2.

Land and Shoreline Use

While relinquishment of water may have the beneficial impact of increasing stream flows or making water available for other uses, it may alter, modify, or curtail existing land uses. Where land uses will be curtailed due to relinquishment, Ecology could provide technical assistance to the property owners to assess what land uses may be appropriate based on water availability. The technical assistance could include assessing crops that require less water than under existing conditions, developing and implementing water conservation methods, or evaluating new alternative land uses.

6.15.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

If multiple relinquishments of water occur within a basin or region, there may be cumulative impacts in changing land use patterns as existing water uses are changed or limited.

Public Services and Utilities

Undertaking effort to evaluate existing water rights and identifying those that are subject to relinquishment in a basin or subbasin would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans, potentially including request for relinquishment actions in other basins or subbasins.

6.16 Alternative WP 16: Request local governments to adopt regulations or for Ecology to adopt rules to minimize use of exempt wells, to restrict the siting of wells in proximity to streams, and/or to restrict the finished depth of new wells to the second aquifer unit or lower.

6.16.1 Impacts

Surface Water

Long-term/operational impacts

Some exempt wells may be shallow and hydraulically connected to surface water. By developing restrictions based on geology/hydrology, this alternative may result in maintaining current stream flow conditions by decreasing surface water capture by ground water pumping. Documenting new wells would provide more information to assess current and future impacts on senior water right holders. As it stands now, there is little knowledge of the number of exempt wells and actual water use associated with this sector. Without regulation, the potential exists that increasing the number of exempt wells could lead to impairment of existing rights, particularly if wells are clustered in shallow aquifers. Regulation of exempt wells may provide needed information for more effective water resource management.

This alternative may help limit future reductions in stream flows in affected stream reaches and may increase stream flows in some areas by increasing return flow to surface waters. The affects of increased flows on surface water quality are described in Section 6.1.1. The effects of decreased flows on water quality are described Section 6.10.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative may help to minimize the unmonitored withdrawals of ground water and may reduce the risk of aquifer mining. The magnitude of this potential impact would depend on the proportion of ground water withdrawals in a basin that are associated with exempt wells.

Wildlife

Long-term/operational impacts

Where water from shallow wells close to streams has been diverted to other uses, this alternative may help protect water that could provide flow for fish and other aquatic life.

Land and Shoreline Use

Long-term/operational impacts

This alternative may reduce development in areas where alternatives to exempt wells are limited or not available. In addition, it may limit the availability of affordable housing by increasing the cost of water for placement of water lines and distribution systems. Thus, the cost of development would increase and that cost would be passed along to homebuyers. Depending on the location and jurisdiction, these costs may be insignificant when amortized over the 30-year life of a home mortgage loan, or may be higher. Restricting the siting of wells in proximity to streams may impact or reduce development in shoreline areas as well by limiting the availability of well water in these areas.

Public Services and Utilities

Short-term impacts

In order to implement this alternative, local governments may need to amend land use plans and zoning or land use codes, and/or Ecology may need to adopt a rule. In addition, public water systems may need to amend their water system plans to expand service areas or to address water line extensions that may be needed to provide service in affected areas.

6.16.2 Mitigation Measures

Land and Shoreline Use

If costs to individual homeowners are significant, implementation of a cost-sharing plan by the implementing city could mitigate the increased cost of a water distribution system.

6.16.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

Implementation of this alternative statewide could result in cumulative and significant unavoidable adverse impacts to homeowners and municipalities in the state.

Public Services and Utilities

Rule making to support this alternative would have a cumulative impact on Ecology when considered in the context of other obligations and actions Ecology may incur associated with implementation of watershed plans, potentially including request for relinquishment actions in other basins or subbasins.

6.17 Alternative WP 17: Where adequate public water supplies are available, request public water systems to extend service into areas served by exempt wells and require any new development to connect to such public water supplies.

6.17.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities associated with extension of water system infrastructure. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term effects of this alternative on water resources are similar to those described in Section 6.1.1.

Long-term/operational impacts

This alternative may prevent further reductions to stream flows in affected stream reaches because less surface water is captured by shallow ground water pumping. Promoting public water system service over exempt wells may replace a shallow well source with a deeper one resulting in increased stream flows. This alternative could also involve converting ground water users (those on exempt wells) to a surface water source, if the public water system in the vicinity uses surface water. In this case, less capture of surface water by ground water pumping would occur, but more water would be withdrawn at the public water system source. Secondary effects include potential minor changes in timing of return flows and, in some instances, changes in location of return flows. Public water system reporting will provide more information on withdrawal and use amounts allowing for better management of the resource. Information would also be available to feed into coordinated water system planning efforts.

Because the effects of this alternative on stream flows will likely be variable, flows in some streams may increase while flows in other streams may decrease. Water levels in lakes or reservoirs may also be affected. The effects of increases in stream flows on water quality are described in Section 6.1.1. The effects of decreases in flows are described in Section 6.10.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative could increase ground water levels in areas previously served by exempt wells. This alternative could also lead to increased withdrawal of ground water in areas served by public water systems due to system expansion into areas previously served by exempt wells. The nature and magnitude of potential impacts would be highly dependent on the specifics of the system(s) and the nature of the local ground water resource.

Plants

Short-term impacts

The short-term impacts to plants are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

This alternative may provide benefits to fish, if ground water previously used by exempt wells is no longer used and the water serves as the base flow for streams. Maintaining higher stream flows in the dry season would provide more fish habitat year round.

Energy and Natural Resources

Short-term impacts

There are short-term impacts to energy and natural resources resulting from the construction of pipelines. Equipment used to excavate the pipeline route consume diesel fuel. However, unless the pipelines are extended a substantial distance, these impacts are not likely to be significant.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from extension of public water systems would be similar to those described in Section 6.1.1.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers and the public could occur if construction activities are conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts

Extending public water supplies into areas served by exempt wells may result in increased costs to existing exempt well owners who, if they choose to connect to the public system, may be required to pay part or all of the costs of extensions and/or connections. An incentives program may need to be developed to encourage existing well owners to participate. Existing exempt well owners in areas experiencing water quality impairments or low well yields may be more inclined to participate than owners in areas not experiencing such problems.

Long-term/operational impacts

This alternative may create conflicts with the Growth Management Act if the areas proposed for water supply extension are not within an urban growth area. The extended availability of public water supplies may create pressures to develop or redevelop affected areas at higher density. Former well owners that choose to connect to the public system would incur ongoing monthly charges for water service. Additional impacts are described in Section 6.16.1.

Cultural Resources

Short-term impacts

Short-term impacts would be similar to those described in Section 6.1.1.

Recreation

Short-term impacts

Short-term impacts from extension of public water systems would be similar to those described in Section 6.1.1.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Long-term/operational impacts

Development in what are now rural areas would result in the need for construction of roads to support greater density of traffic.

Public Services and Utilities

Short-term impacts

Implementation of this alternative may require revisions to local comprehensive land use plans and/or update of the water system plan of the participating public water system. Funding would need to be identified to finance major water line extensions. In areas already heavily developed with exempt wells, public water systems may elect not to participate because of the lack of a mechanism to require connection by existing well owners. Thus, there would be no assurance that the costs of the line extension would be recouped.

Long-term/operational impacts

The participating public water system would need to maintain the additional infrastructure installed to implement this alternative.

6.17.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air
Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Minimization of the geographic extent of changes in the points of diversion and use would assist in mitigating any minimal impacts to surface water quantity from this alternative.
Mitigation measures to address water quantity and quality that are appropriate for this alternative are discussed in Section 6.10.2.

Ground Water
Potential unacceptable changes in the distribution of ground water withdrawals could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to implementing the changes. In cases where such impacts would be likely, system expansion could be adjusted or avoided.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Scenic Resources and Aesthetics
Landscaping the disturbed area after construction could diminish any impact to scenic resources and aesthetics.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2.

Land and Shoreline Use
Potential mitigation measures are described in Section 6.16.2. In addition, land use plans could be modified to accommodate potential changes in land use activities.

Cultural Resources
Mitigation measures would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2. Long-term impacts (need for new/expanded roads) could be mitigated by the funding of road expansion projects by affected cities/counties.

Public Services and Utilities
Incentive programs could be developed to encourage compliance by exiting well owners. This could include grants or low interest loans for part or all of the cost of line extensions and service connections.

6.17.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Potential cumulative and significant unavoidable adverse impacts on surface water quality are as described in Section 6.10.3.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Land and Shoreline Use
Implementation of this alternative statewide could result in increased development of currently rural areas. Increased urbanization may result in adverse impacts on water quality, habitat, earth, and other environmental media. Therefore, this alternative may result in significant cumulative and unavoidable adverse impacts.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Transportation
Cumulative or unavoidable adverse impacts to transportation systems include the increased costs of road expansion and maintenance associated with growth potentially created by extension of public services. Statewide, this impact could be significant.

6.18 Alternative WP 18: Request Ecology to require water users to install, operate, and maintain water quantity monitoring devices such as meters and gauges.

6.18.1 <u>Impacts</u>

Surface Water

Short-term impacts

Placement of flow meters and other water monitoring devices in streams or irrigation ditches may result in short-term construction-related impacts such as temporary increases in sediment input. The impact may result in increases to sediment load, but that is expected to be negligible.

Long-term/operational impacts

Support of enforcement, record keeping, and metering would provide many operational benefits such as more accurate understanding of water use and clearer information regarding the status of water rights. Metering may result in better understanding of actual water use at each point of diversion; this knowledge may help reduce use. These measures may increase stream flows by curtailment of illegal water usage and identification of priority areas for water conservation measures. Meters used in conjunction with rate structures may decrease demand resulting in increases in stream flow.

Improvements in the understanding of water use and water management may subsequently trigger other alternatives. Those secondary impacts on water resources are variable as described throughout this document.

Ground Water

Long-term/operational impacts

Implementation of this alternative could improve the management of ground water resources to the extent that information from these devices is used in management decisions.

Scenic Resources and Aesthetics

Short-term impacts

The placement of in-water monitoring devices may temporarily increase turbidity and cause the water to look cloudy. This turbidity will dissipate once the equipment is in place.

Land and Shoreline Use

Short-term impacts

Water users would likely be responsible for incurring costs associated with equipment installation in most cases.

Long-term/operational impacts

Water users would likely be responsible for incurring costs associated with recording and reporting monitoring data.

Public Services and Utilities

Short-term impacts

Ecology would need resources for providing public outreach and technical assistance regarding monitoring requirements and installation of monitoring devices.

Long-term/operational impacts

Ecology resources would be needed for enforcement activities and data compilation, evaluation, and storage associated with implementation of this alternative.

6.18.2 Mitigation Measures

Surface Water

Improvements in the understanding of water use may result in better water management, which subsequently could trigger any of the other alternatives. The effects on water quality are variable as described throughout this document. The appropriate mitigation measures are also discussed under each alternative. One option would be to construct during periods of low flow, thereby reducing the particulate matter and turbidity that enters the water

Land and Shoreline Use

Grant or low interest loan programs could be developed to help water users offset the costs of purchasing and installing monitoring equipment. Ecology is currently administering a grant program to assist water users that are required to measure water use under Chapter 173-173 WAC.

6.18.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

No cumulative or significant unavoidable adverse impacts are predicted from this alternative. However, improvements in the understanding of water use may result in better water management, which subsequently could trigger any of the other alternatives. The cumulative and significant unavoidable adverse impacts on water resources are variable as described throughout this document.

Ground Water

No cumulative or significant unavoidable adverse impacts are predicted from this alternative. However, improvements in the understanding of water use may result in better water management, which subsequently could trigger any of the other alternatives. The cumulative and significant unavoidable adverse impacts on water resources are variable as described throughout this document.

6.19 Alternative WP 19: Construct and operate new on-channel storage facilities.

6.19.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1. In addition, design plan reviews and construction inspections by the Dam Safety Office (DSO) may result in required changes to design and construction practices that may lead to environmental impacts not predicted prior to construction. Changes to design and construction practices independent of the DSO may also occur after the start of construction.

Long-term/operational impacts

It is possible that changes in ground water levels and the weight of the water stored in such facilities could lead to geologic instabilities. These could include local subsidence, increased slope failures, and erosion due to development of new seeps and springs. To eliminate, manage, or reduce the risks associated with potential or actual geologic instabilities may require structural changes to the facility itself, and construction of control or mitigation structures both upstream and downstream of the facility.

Changes to watershed hydrology and downstream risk may require changes to structural elements of the facilities over the long term. Potential development of both the watershed and the area surrounding the downstream channel will increase risk and alter the hydrologic regime and channel morphology.

In addition, construction of these facilities would involve consumption of earth resources, such as gravel, sand, and concrete.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1. In addition, the presence of new open-air water storage facilities in an arid or semi-arid area could cause localized microclimate changes in the immediate surroundings. The increased moisture content in the air over and near the facility would not be sufficient to cause regional climate changes, but could induce growth in the immediate surroundings of plant types not typically found in the area. These microclimate changes would not likely constitute a significant air quality impact.

Surface Water

Short-term impacts

Temporary construction-related impacts may be associated with the construction of new storage facilities. On-channel impacts may occur primarily during dam and overflow spillway construction phase. Interruption of flow may occur during this phase.

Construction of on-channel storage facilities also requires substantial disturbance of earth. There is a potential for intermediate-term post-construction sediment loading to the downstream channel from sloughing and superficial erosion of earthen berms until the berm surface reaches structural stability. Similarly, there could be increased sediment loading to the reservoir from bank sloughing until the banks reach structural equilibrium. These sediment inputs to water bodies even if short-term may be significant. The effects of those inputs are described in Section 6.2.1.

The construction phase of a large or small on-channel impoundment can also pose unique threats from dam breach during the short periods where structural elements and failsafe design features are incomplete or awaiting final inspection. Construction plans should be evaluated to identify these vulnerabilities and modified to minimize the probabilities of inadvertent failure due to lapses in construction management.

Long-term/operational impacts

Construction of new on-channel storage facilities would change the stream reach from free flowing to a regulated river, thereby affecting the flow regime and stream morphology processes downstream. The storage structure would, by design, change the flow regime by storing more water during high flow periods and presumably releasing it during lower flow periods to augment instream flows and other beneficial uses. Creating an impoundment would also interrupt natural surface and subsurface flow routing. The flux of shallow ground water typically moving laterally toward the stream would be altered. Similarly, the surface water elevation of tributary streams in the inundation area would be altered as the water backs up behind the impoundment rather than flowing freely downstream. A new equilibrium between upland flow and the new surface water elevation of the reservoir would be established. In addition, evaporative losses would be expected from the surface of any reservoir.

The specific nature and degree of the impacts to surface water resources would depend on the operations of the storage facility. Other long-term impacts may include:

- Long-term rapid fluctuations in reservoir and downstream channel water surface levels dependent on gate operation, which will have large impacts on near bank and over bank biota.

- Seasonal <u>increases</u> to downstream sediment loading and gas entrainment resulting from rapid drawdown in anticipation of flood events (Flushing of sediment accumulation behind the dam and spill water gas entrainment).

- Blockage of natural debris carried downstream by the stream, impacting the organic loads in the stream.

- Potential changes in downstream over bank soil characterization and riparian zone vegetation due to changes in flood inundation profile (flood control).

- Eventual silting of the reservoir that will require dredging or render the structure inoperable, with the ensuing environmental impacts.

- Potential breach events resulting in catastrophic flood inundation profiles. With any reservoir there exists the potential for the dam to breach resulting in catastrophic flood inundation downstream. Dam safety regulations would require a host of studies such as a downstream hazard assessment and mapping of potentially inundated areas. In addition, an emergency action plan would be required to alert and evacuate downstream residents in the event of a dam breach.

- Construction of on-channel storage facilities also requires substantial disturbance of earth.

Construction of on-channel storage facilities may have substantial long-term effects on water quality. Effects may include, but may not be limited to:

- Decreased turbidity and bedload sediment downstream of the impoundment;

- Increased stream temperature downstream of the impoundment;

- Decreased dissolved oxygen downstream of the impoundment;

- Increased stream temperature within the impoundment;

- Potential for eutrophication of water where nutrient levels are high; and

- Potential for the accumulation of pollutants in the sediments at the headwaters of the impoundment.

- Decreased organic loads in stream below reservoir due to blockage of natural debris behind the dam.

The extent of the impacts of on-channel storage facilities on water quality will be dependent upon the size of the facility. Small impoundments (for example, impoundments the size of stock ponds or run-of-river diversions) may not have substantial effects on water quality. Large dams may have very significant effects. The local nutrient loading and the mitigation measures incorporated into the project will also influence the changes in water quality associated with on-channel facilities.

Ground Water

Short-term impacts

Short-term impacts to ground water resources could involve changes in ground water levels and gradients during construction should construction include substantial ground water control activities.

Long-term/operational impacts

Implementation of this alternative could substantially increase ground water levels in the vicinity of the storage facilities. The magnitude of this potential impact would depend on the size, depth, and permeability of the storage facility and on the properties of the underlying aquifers.

To comply with dam safety regulations, an inspection program would be required to monitor for potential seepage in the immediate vicinity of the dam, near the toe of the dam and its abutments. This activity, which would occur over the life of the structure, would involve the installation and maintenance of permanent and temporary piezometers, observations wells, seepage galleries, geotechnical soil and rock borings, and excavated test pits. These monitoring activities may have long-term environmental impacts.

The dam operator may also need to monitor ground water levels and flow in the vicinity of the impoundment. This may require the installation, maintenance, and abandonment of piezometers, test wells, and observation wells.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The operation of new on-channel storage facilities would involve permanent loss of plant communities in areas covered or inundated by the facility. To comply with dam safety regulations, all large and deep rooted plants would be permanently prohibited on the face of an earthen impoundment structure. Grasses or other shallow rooted plants would need to be permanently maintained to permit regular and unhindered inspection of the impoundment surface. Plant debris in the reservoir would need to be periodically removed from the upstream face of the impoundment, with particular attention given to keeping spillways and outlets free of plant debris.

Additional humidity and change in hydrology through inundation may alter the existing plant communities (riparian or upland) near the shoreline. Long term rapid fluctuations in reservoir and downstream channel water surface levels could have large impacts on near bank and over bank biota. Reservoir operation schedules could be set to minimize this impact. Potential changes could occur in downstream over bank soil characterization and riparian zone vegetation due to changes in flood inundation profile (flood control)

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

New on-channel storage facilities would permanently displace terrestrial animal species in and around the dam or impoundment by inundation of their habitat. The level of effect will be dependent upon the quality of current habitat and the species assemblages using that habitat as well as the size of the facility. Where facilities are constructed in arid areas, some species may be benefited by the addition of water available during dry seasons.

The impacts of on-channel storage facilities on aquatic biota will depend on the current species present at the location of the facility and downstream of the facility, the size and engineering characteristics of the facility, and whether any aquatic species are stocked into the impoundment. When the facility is built on a stream with no fish and the impoundment is not stocked, the impacts to aquatic biota will be less than those arising from impoundments within fish bearing waters. Impoundments upstream of fish bearing waters can have several downstream effects on fish habitat including:

- Modification of downstream flows that may affect the quality of downstream rearing, spawning, or migrating habitat through changes in water level and/or changes in habitat (modification of pool size and frequency, redd scour, flushing of sediment from spawning gravels, changes in channel morphology);
- Increased stream temperature in the reach below the facility;
- Decreased dissolved oxygen for a short distance below the facility;
- Decreased movement of wood downstream into fish bearing waters;
- Decreased turbidity; and
- Decreased movement of spawning gravel into downstream spawning habitats.

The extent of these impacts will vary with the size of the facility and the mitigating measures taken to reduce effects.

When the facility is built on a fish-bearing stream, possible effects on aquatic biota are many and include:

- Where the stream channel to be impounded is currently occupied by coldwater fish, construction of facilities could result in the loss of coldwater habitat. The effects may be particularly pronounced if the reservoir is shallow and/or stratifies such that no habitat is both cool and well oxygenated during the summer.
- Where the stream channel to be impounded currently is occupied by migratory fish species, upstream migration and access to upstream habitat may be lost unless adequate fish passage structures are included in the design.
- Where spawning habitat is located downstream of the facility, spawning habitat may be degraded; reservoirs tend to capture spawning gravel and stop its downstream movement, resulting in reductions of gravel downstream.
- Where fish are present downstream of the facility, habitat may benefit through reductions in downstream turbidity.

- Where non-native species are introduced into the reservoir (for example, bass, sunfish, walleye, and brook trout), non-native fish may out compete native species with the reservoir and may also escape to areas upstream and downstream of the facility where that may also compete with native species.

- Where larger native warm water species are present, such as the northern pikeminnow, an increased area of slow moving water may result in an increase of native species that compete with salmonids. This is likely to occur only in situations where large, low gradient rivers are impounded.

- Where the outfall from the reservoir is at the surface and surface water is warm, warm water may be discharged downstream. If water temperatures exceed those that are optimum for native species, fish production may be reduced for a distance downstream.

- Where the outfall from the reservoir is located deep in the reservoir, discharge water may be low in dissolved oxygen, which could adversely affect fish for a short distance downstream of the release.

- Where the facility is located on a fish-bearing stream and management of the facility results in decreased downstream flows during summer rearing periods and/or migration periods, downstream fish production may be reduced.

- Large fluctuations in water level could affect invertebrate production within the reservoir.

Energy and Natural Resources

Short-term impacts

Construction of a new impoundment, either earthen or concrete, requires the structure to be keyed into regional bedrock. If there is a local zone of saturation above this bedrock feature, the ground water must be continuously controlled during construction.

There are short-term impacts to energy and natural resources resulting from the construction of new facilities. Equipment used to excavate the storage facility consume diesel fuel. The ground water control techniques consume electrical energy. One method employed to control ground water at an excavation is to freeze the regional ground water. Pipes are inserted in drilled shafts and cold fluids are pumped through. This method is very energy intensive, but does not require pumping to lower the regional water table.

Long-term/operational impacts

If the river or stream gradient is sufficient, the new dam can be designed and constructed to generate electrical power, thus adding power to the regional grid.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from this alternative are similar to those described in Section 6.5.1.

Long-term/operational impacts

Long-term impacts to scenic resources could occur as a result of constructing permanent buildings and structures. If the program involved building a permanent structure at the storage facility, then its location would need to be assessed for compatibility within the surrounding environment. For example, in an urban area where other buildings are prolific, an adverse impact would not be expected. However, under a more likely scenario in which the area is valued for its natural scenic views, a building or buildings could potentially cause a visual disruption to the surrounding area.

In addition, construction of new on-channel storage facilities may change the stream reach from free flowing to a regulated river, thereby, affecting the water flows downstream. The flow would become more regulated, by storing more water during high flow periods and presumably releasing it during lower flow periods to augment instream flows and other beneficial uses. Some changes may occur in vegetation and the water levels may expose more or less rock, vegetation, bank, etc. depending on the amount of water released. As changes in water flows occur seasonally and during stormwater events, it is unlikely that the change in water flows downstream would cause a significantly adverse impact to scenic resources.

Environmental Health

Short-term impacts

Temporary construction-related safety impacts to workers could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Long-term/operational impacts

Failure of a dam or other on-channel storage facility may result in significant adverse public health and safety impacts. Based on national statistics, dam failures are caused by overtopping (34% of failures), foundation defects (30%), piping failures and seepage (20%), conduits and valves (10%), and other causes (6%) (Ecology 2002). Numerous dam failures have occurred in Washington State, including the White River Incident in July 1976, which resulted in the loss of two lives, and the Eastwick Railroad Fill Failure near North Bend in 1932, which resulted in the loss of seven lives. In addition, the Seminary Hill Reservoir failed in October 1991 due to a massive landslide beneath the embankment that released 3.5 million gallons of water in less than three minutes, flooding a residential area and destroying or damaging numerous homes. Impacts associated with a dam failure may range from none to extensive loss of life, depending on the size and location of the dam.

In addition to loss of life or damage to residential areas, potential impacts of a dam failure may include:

- Loss of or damage to downstream public infrastructure including wastewater treatment systems, water conveyance systems, bridges, electrical power systems, and emergency response facilities;

- Release of deleterious materials resulting in short- or long-term water quality impacts and general environmental degradation;

- Deposit of degraded water and biologically contaminated material that will increase the risk of communicable diseases;

- Loss of transportation links, including road and rail lines;

- Loss of water supply and irrigation supply;

- Damage of downstream public facilities including fish hatcheries, hospitals, industrial and commercial developments, and government buildings;

- Extreme scouring of the river channel and over banks, resulting in changes to channel hydraulics, habitat, and aesthetics; and

- Economic activity curtailments.

On the other hand, operation of on-channel storage facilities may reduce the risk of downstream flooding by temporarily storing water during flood events. This would likely result in a beneficial health impact to the population downstream of the facility by reducing injuries and/or fatalities from flood events.

Land and Shoreline Use

Short-term impacts

Implementation of this alternative would result in short-term impacts to land and shoreline use. Development must be consistent with applicable critical area ordinances and shoreline master programs. Extensive property acquisition may be required in order to construct an on-channel storage facility.

Long-term/operational impacts

Implementation of this alternative would likely result in significant adverse impacts to land use. An on-channel storage facility would inundate shoreline areas and eliminate current land uses in those shoreline areas. Construction costs of an on-channel storage facility may be high. The substantial costs of construction may require new or increases in existing water rates for irrigation, municipal, and industrial uses.

Potential beneficial long-term impacts of this alternative are that additional water resources would be made available for out-of-stream uses including irrigated agriculture and urban development and possibly for instream uses such as recreation.

Cultural Resources

Short-term impacts

Short-term impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Adverse impacts may result from alterations of the flow regime and habitat of rivers with potential cultural significance for traditional users. Changes in flow regimes may also adversely impact streamside archaeological resources by erosion and inundation. Rising and falling water levels and wave action can adversely affect archaeological resources by eroding the site. This can result in loss of context of artifacts and features, as well as artifact abrasion.

Recreation

Long-term/operational impacts

Construction of an on-stream storage facility could impact recreation resources over the long term. In some cases, it would create recreational opportunities requiring a large body of water. However, recreational opportunities such as canoeing and kayaking, which rely on a particular stream volume, could decrease depending on the flow. The total size of the recreation area would need to be reviewed and analyzed. If the recreation area is small, then the addition of a reclamation plant may create crowding or displace some users. If the recreation area were large, then only a minimal impact to recreation use would occur.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1 above. In addition, this alternative would result in significant increases in truck traffic to and from material supply and disposal sites, due to the potentially large materials requirements, such as concrete, rock, gravel, and fill. The level of impact on transportation systems would be proportional to the size of the project (the volume of construction materials/disposal required), and the location of the project (the distance that materials/waste would need to travel).

Long-term/operational impacts

Depending on the project's location, implementation of this alternative could require the relocation of roads, highways, or railroads in the project area. This would potentially result in minor to moderate impacts on transportation systems, depending on the number of people affected by the relocation, the number of road/highway/railroad miles that are relocated, and the distances involved. By constructing a barrier across a river channel, this alternative may also impede navigation by barges or other boats that use the river for transportation purposes. This alternative could result in significant adverse impacts on navigation.

Public Services and Utilities

Short-term impacts

Construction of an on-channel storage facility would likely require significant financial resources for project design and project construction. Large scale projects may not be feasible without congressional or state legislative appropriations, or both. To offset part or all of project costs, increases in existing water rates (irrigation, municipal, etc.) may be necessary.

Public funding may need to be procured for relocation of roads or other transportation infrastructure that may be needed if existing infrastructure becomes inundated.

Substantial state and local agency involvement in permitting, including environmental review (SEPA/NEPA), would likely be necessary.

Long-term/operational impacts

The operating entity may require significant resources for operation and maintenance.

6.19.2 Mitigation Measures

Earth

Mitigation measures for temporary construction-related impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

The risk associated with geological instability caused by the increased ground water levels and weight of the impounded water may be reduced through geotechnical design and long-term monitoring of facility.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Short-term impacts on water quantity can be mitigated by minimizing the area of disturbance. Long-term impacts may be mitigated by:

- Developing an augmentation plan to reduce the impacts on other water right holders;
- Developing operating rule curves to compensate for flow alterations;
- Scheduling high flow releases to mimic natural event magnitudes; and
- Releasing sediment from facilities along with flushing flows to maintain natural scour patterns.

Short-term effects of construction on water quality can be mitigated to some extent by implementing soil erosion BMPs, constructing the facility "in-the-dry," and vegetating disturbed areas quickly. Some sediment input to streams is unavoidable.

Long-term effects of on-channel facilities on water quality can be substantial. Mitigation of some of these effects may include:

- Controlling the depth of the outfall to minimize downstream effects on temperature and dissolved oxygen;
- Providing sediment by-pass facilities (only effective on small impoundments); and
- Implementing measures to control nutrient inputs.

Numerous other mitigation measures may also be appropriate and will tend to be project-specific. Proposed on-channel facilities should go through careful review to ensure that the potential effects are well understood and that the appropriate mitigation measures are applied.

Ground Water
Potential unacceptable changes in ground water levels during construction water control activities could be mitigated through proper design and through the use of methods such as use of temporary impermeable barriers (e.g., sheet piling) to minimize off-site impacts to ground water levels and gradients.

Potential unacceptable changes in ground water levels, both during construction and operation, could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to final design and construction. In cases where such impacts would be likely, the location, depth, and size of the storage facility could be modified as needed.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities. In addition, for those lands that are affected by inundation of water, a project level SEPA evaluation may be needed to determine site-specific impacts on the environment from constructing an on-channel storage facility.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Many of the potential effects on aquatic biota can be minimized by locating facilities on streams that contain no fish. In such cases, the effects of the facility on downstream fish resources should be carefully reviewed and appropriate mitigation plans developed. Mitigation measures may include leaving sufficient buffers between the facility and the fish bearing waters to ensure that stream temperature and dissolved oxygen levels have returned to acceptable levels, and sediment bypass structures. The downstream effect of flow modification may be addressed through manipulation of flow releases at appropriate times.

Where facilities are considered within fish-bearing waters, detailed mitigation plans should be developed. These should address downstream flows for fish, water quality (especially water temperature and dissolved oxygen), and fish passage. The potential effects on downstream spawning gravels should also be considered. Those impacts are not inherent in such projects but can be significant in certain geologic areas. Finally, the impacts of stocking of the impoundment with non-native species should be considered carefully. All such facilities should undergo detailed environmental review during the design phase to assure that impacts are avoided to the degree possible.

Energy and Natural Resources
Project proponents should evaluate options for controlling ground water during construction and should select the option that provides reliable control but consumes relatively low levels of energy. The contractor should identify local sources of construction materials to minimize the consumption of energy for transportation.

Scenic Resources and Aesthetics
Landscaping the disturbed area after construction could diminish the impact to scenic resources and aesthetics. However, for larger on-channel projects, the visual character would remain affected.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2. Mitigation measures to reduce long-term public health impacts include the construction and operation of on-channel storage facilities consistent with all applicable regulatory requirements, including siting, design, construction, operation, monitoring, annual inspection, and long-term maintenance requirements. In addition, an emergency action plan should be developed in areas where a failure of the dam could pose a threat to life. Potentially applicable requirements and guidelines include the Washington Dam Safety Regulations (Chapter 173-175 Washington Administrative Code [WAC]) and Ecology's Dam Safety Guidelines (1992).

Land and Shoreline Use
Potential mitigation measures include soliciting public input to the planning process and providing sufficient advance notice to potentially affected property owners. Property owners should be compensated at fair market value for any property that may need to be acquired for construction of the storage facilities.

Cultural Resources
Mitigation measures for short-term construction impacts and long-term operational impacts to archaeological resources are described in Section 6.1.2. Mitigation measures for traditional resources would be identified in consultation with the appropriate Native American or other traditional users.

Recreation
By limiting the change in flow of the stream, recreational opportunities could continue. However, the quality and types of the recreation would still change.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2. To reduce the impact of relocations of roads, highways, and railroads, appropriate directional signs could be installed. The public media could be used to communicate the modifications to the public and thereby reduce confusion.

Replacement roads or road segments could be constructed prior to the completion of the on-channel storage facility. Impacts to navigation could be mitigated by the construction of boat passages (locks).

Public Services and Utilities
Analyses of funding needs conducted by proponents for storage projects should consider all short- and long-term public services costs and impacts, including resources required for permitting and public processes. Compensation should be provided for agency costs incurred in permitting and conducting public processes where appropriate.

6.19.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth

Cumulative and significant unavoidable adverse impacts to earth resources associated with this alternative are the same as those discussed in Section 6.5.3.

Air

Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water

Constructing a new on-channel storage facility will likely result in permanent changes to the flow regimes of the stream or river depending on operations. Typically, storage facilities reduce peak flows and augment low flows thereby altering the shape of the hydrograph downstream of the dam. There will also be increased evaporative losses from the reservoir.

There will likely be significant unavoidable adverse effects on water quality. The magnitude of those effects will be project-specific and should be addressed through an appropriate environmental review.

Ground Water

Operating an on-channel storage facility could permanently increase ground water recharge rates and thus, ground water levels, in the vicinity of the storage facility. The magnitude of these impacts would depend on the local hydrogeologic situation (for example, reservoir permeability and water table elevation) and on the hydraulic head created by the storage impoundment.

Plants

Plant communities in the inundated areas would be permanently altered from terrestrial to aquatic communities.

Wildlife

Terrestrial wildlife would be permanently displaced. Aquatic wildlife would replace the terrestrial wildlife species in the inundated areas.

Energy and Natural Resources

If this alternative is selected in many locations statewide, the construction impacts described would be considered a significant unavoidable adverse impact. As more of these facilities are constructed and operated, the energy consumption would be a cumulative impact that is unavoidable. On the other hand, if the facilities also generate hydropower, they may add to the available energy supplies across the state.

Scenic Resources and Aesthetics

Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Environmental Health

Washington State has over 1,100 dams, built for a variety of purposes including irrigation, power, flood control, and water storage. Although failure of an individual on-channel storage facility is considered unlikely, implementation of this alternative statewide could contribute to cumulative public health impacts.

Land and Shoreline Use

Implementation of this alternative in numerous locations throughout the state could result in the displacement of many landowners, and therefore, may result in cumulative and significant unavoidable impacts.

Cultural Resources

Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation

Cumulative impacts could occur if numerous new on-channel storage facilities were built. Recreationists using rivers may see a decrease in the quality of the recreation experience, as water levels would likely become more level year round. Lake or reservoir recreational activities such as water-skiing would see an increase in the opportunities.

Transportation

Although construction impacts would be short-term and temporary, implementation of this alternative could result in cumulative and significant unavoidable impacts to transportation systems, particularly if a number of on-channel storage facilities are constructed across the state. Impacts on navigation and road/highway/railroad relocations will depend on the number, location, and size of the facilities.

Public Services and Utilities

There may be significant opportunity costs associated with public funding of storage facilities, particularly larger and more costly facilities. That is, public funds spent on construction of a storage facility would not be available for other public purposes.

6.20 Alternative WP 20: Raise and continue to operate existing on-channel storage facilities.

6.20.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Sections 6.1.1 and 6.19.1.

Long-term/operational impacts

Long-term impacts would be similar to those described in Section 6.19.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

The short-term impacts of construction of facilities on surface water resources are as described in Section 6.19.1.

Long-term/operational impacts

The long-term impacts of raising existing on-channel storage facilities on surface water may range from negligible to highly significant. Impacts may include those discussed in Section 6.19.1. Fluvial processes already disturbed from the first construction may be slightly altered due to the expansion. Peak flows may be further reduced and low flows may be increased. Evaporative losses would be predicted to increase in proportion to the increase in surface area. In cases where large existing facilities are raised by a small percentage, the effects may be small. In cases where small facilities are increased significantly in size, the effects may be pronounced.

Modifications to existing dam structures must be authorized by the Dam Safety Office and must conform to the provisions of the guidelines for structural modification outlined in WAC173-175. As the elevation of an existing structure is raised, the volume stored behind the reservoir will increase exponentially. The increased volume due to elevation increases magnifies the downstream risks.

Ground Water

Short-term impacts

Impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Long-term/operational impacts

Impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The long-term impacts to plant communities are predicted to be similar to those described in Section 6.19.1. It should be noted that as the elevation of an existing structure is raised, the volume stored behind the reservoir will increase exponentially and result in correspondingly greater downstream impacts.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The long-term impacts to wildlife are predicted to be similar to those described in Section 6.19.1. It should be noted that as the elevation of an existing structure is raised, the volume stored behind the reservoir will increase exponentially and result in correspondingly greater downstream impacts. Raising an existing on-channel storage facility could also provide an opportunity to install fish passage facilities where such facilities do not currently exist, or improve existing fish passage facilities.

Energy and Natural Resources

Short-term impacts

The short-term impacts are similar to those described in Section 6.19.1.

Long-term/operational impacts

If the existing structure is a hydropower generator, raising the structure may have the potential to generate additional hydropower. If the facility is not currently a generator of hydropower, raising the level may provide a concurrent opportunity to retrofit the facility for power generation.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from operating existing on-channel storage facilities would be similar to those described in Section 6.5.1.

Long-term/operational impacts

The viewscape could be altered depending on the extent of change in water level at a storage facility. However, as the existing storage facilities are already located in disturbed areas, it is unlikely that significant adverse impacts would occur from modification of such facilities.

Environmental Health

Short-term impacts

Temporary construction-related health and safety impacts to workers could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Long-term/operational impacts

Failure of a dam or other on-channel storage facility may result in significant adverse public health and safety impacts. Potential public health impacts associated with this alternative are similar to those described in Section 6.19.1. Any modification to the dam structure will require the authorization of the Dam Safety Office (DSO) and must conform to the provisions of guidelines for structural modifications outlined in WAC 173-175. It should be noted that reservoir volume typically increases as a power function of water surface elevation, thus creating progressively increased risk to downstream residents and properties from flood inundation. As the flood inundation profile increases in cross sectional area, the average velocity and depth increase and thus the forces associated with the flood wave that impact downstream structures will increase as well.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts to land use associated with this alternative are similar to those identified in Section 6.19.1.

Long-term/operational impacts

Implementation of this alternative may result in significant long-term impacts to land use, based on the amount of land and type of land use affected. Raising an existing on-channel storage facility would inundate additional shoreline areas and eliminate current land uses in those shoreline areas. The substantial costs of construction may require new or increases in existing water rates for irrigation, municipal, and industrial uses.

Potential beneficial long-term impacts of this alternative are that additional water resources would be made available for out-of-stream uses including irrigated agriculture and urban development.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Long-term operational impacts to cultural resources may include erosion and inundation of resources as a result of operating on-channel storage facilities. Rising and falling water levels and wave action can adversely affect archaeological resources by eroding the site. This can result in loss of context of artifacts and features, as well as artifact abrasion.

Recreation

Short-term impacts

Recreation use and access may be temporarily disrupted as a result of construction-related project activities. During construction, access to particular areas may be prohibited. Once completed though, recreation use would continue in the area.

Long-term/operational impacts

Additional storage could create additional recreational activities such as swimming and fishing.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Sections 6.1.1 and 6.19.1.

Long-term/operational impacts

Potential long-term impacts to transportation systems are described in Section 6.19.1.

Public Services and Utilities

Short-term impacts

Short-term impacts to public services would be similar to those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts to public services would be similar to those described in Section 6.19.1.

6.20.2 Mitigation Measures

Earth

Mitigation for impacts to earth resources associated with this alternative would be similar to those described in Section 6.19.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Mitigations measures to address surface water quality issues that are appropriate for this alternative are the same as described in Section 6.19.2.

Ground Water
Mitigation measures for impacts to ground water associated with this alternative are the same as those discussed in Section 6.19.2.

Plants
Mitigation measures that would reduce impacts to plant communities for this alternative are similar to those described in Section 6.19.2.

Wildlife
Mitigation measures to minimize impacts to fish and wildlife under this alternative are similar to those described in Section 6.19.2.

Energy and Natural Resources
Mitigation measures are described in Section 6.19.2.

Scenic Resources and Aesthetics
Restoring vegetation in areas disturbed by construction could diminish the impact to scenic resources and aesthetics.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2. Mitigation measures to reduce long-term public health and safety impacts are described in Section 6.19.2.

Land and Shoreline Use
Potential mitigation measures are described in Section 6.19.2.

Cultural Resources
Mitigation measures for short-term construction impacts are similar to those described in Section 6.1.2. Mitigation measures for long-term operational impacts may include measures identified for short-term impacts, as well as site stabilization measures.

Recreation
Existing structures and/or operations could be modified to allow continued recreational use.

Transportation
Potential mitigation measures for short-term and long-term impacts to transportation systems are described in Sections 6.1.2 and 6.19.2, respectively.

Public Services and Utilities
Potential mitigation measures would be similar to those described in Section 6.19.2.

6.20.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth
Cumulative and significant unavoidable adverse impacts to earth resources associated with this alternative are the same as those discussed in Section 6.5.3.

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Cumulative impacts and significant unavoidable adverse impacts on surface water resources are the same as those described in Section 6.19.3.

Ground Water
Raising the level of existing on-channel storage facilities could permanently increase ground water recharge rates and thus, ground water levels, in the vicinity of the storage facility. The magnitude of these impacts would depend on the local hydrogeologic situation (for example, reservoir permeability and water table elevation) and on the degree to which the level of the storage facility is raised.

Plants
Cumulative impacts and significant unavoidable adverse impacts to plant communities are similar to those predicted in Section 6.19.3, but to a lesser degree.

Wildlife
Cumulative impacts and significant unavoidable adverse impacts to upland wildlife communities are similar to those predicted in Section 6.19.3, but to a lesser degree.

Energy and Natural Resources
Cumulative impacts and significant unavoidable adverse impacts are described in Section 6.19.3.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Environmental Health
Cumulative and significant unavoidable adverse impacts associated with long-term operation of on-channel storage facilities are the same as described in Section 6.19.3.

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts to land and shoreline use are discussed in Section 6.19.3.

Cultural Resources
Cumulative impacts would be similar to those identified in Section 6.1.3. Significant unavoidable adverse impacts to archaeological resources may result from erosion and inundation of resources.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Transportation
Potential cumulative and significant unavoidable adverse impacts associated with this alternative are the same as described in Section 6.19.3.

Public Services and Utilities
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be similar to those described in Section 6.19.3.

6.21 Alternative WP 21: Construct and operate new off-channel storage facilities.

6.21.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Sections 6.1.1 and 6.19.1.

Long-term/operational impacts

Long-term impacts would be the same as those described in Sections 6.19.1 and 6.20.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Temporary construction-related impacts may be associated with construction of new storage facilities. Construction impacts may be experienced both off-channel and on-channel. On-channel impacts would occur primarily during intake construction phase. Interruption of flow may occur during this phase and when the intake at the river is connected to the off-channel reservoir.

Short-term effects of construction on surface water quality are similar to those described in Sections 6.2.1 and 6.19.1.

Long-term/operational impacts

Storage projects could be used effectively to change the flow regime by storing winter high flows and augmenting instream flows and other beneficial uses during low-flow seasons. The specific nature of the impacts to surface water resources would depend on how the storage facility was operated (as in 6.19.1). Construction of new off-channel storage facilities could change the stream morphology and flow regime downstream of the intake. Secondary effects may include enhancement of recharge under the reservoir. However, evaporative losses would be predicted from any reservoir.

With regard to dam safety issues, creating storage in off-channel impoundments could have the same long-term impacts as on-channel storage facilities (6.19.1).

Construction of off-channel storage facilities may have significant effects on stream flow. The effects of reduced stream flow on surface water quality are discussed in Section 6.10.1. In addition, water quality could be affected if the off-channel facility was build on a location where local soils and/or geology contained contaminants (such as high concentrations of aluminum). The magnitude of effect would be dependent upon local conditions.

Ground Water

Short-term impacts

Impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Long-term/operational impacts

Impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Implementation of this alternative is predicted to be similar to those described in Section 6.19.1.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Impacts from implementation of this alternative on terrestrial and aquatic biota would be similar to, but of lesser magnitude than, those described in Section 6.19.1.

In addition, if the storage water chemistry (for example, temperature, dissolved oxygen, alkalinity, and nitrates) is significantly different than receiving waters, then such water chemistry differences could impact downstream fish and other aquatic organisms. Where such impoundment projects result in the diversion of water from one basin to another, one stream may have reduced flows and the other may have increased flows. The effects of those changes in flows would be similar to those described in Sections 6.1.1, 6.1.2, and 6.19.1. Finally, impoundments are likely to result in changes in flow regimes downstream of the facility. If flows are reduced in summer or during fish migration periods, production of downstream fish populations may be reduced, particularly if flows are decreased to a point where flows become limiting on the populations.

Energy and Natural Resources

Short-term impacts

The short-term impacts are similar to those described in Section 6.19.1.

Long-term/operational impacts

Off-channel storage facilities typically require pumps to transfer the water from the existing stream channel to the impoundment. Depending on the grade difference, these electrical costs can be significant.

If the gradient between the facility outlet and the receiving water is sufficient, the new dam can be designed and constructed to generate electrical power, thus adding power to the regional grid. However, because of the cost of pumping the water to the storage facility, this scenario may only provide seasonal gains by storing water when runoff is high (when there is an abundance of hydropower available) and generating power when hydropower is less available and prices may be higher.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from the operation of new off-channel storage facilities would be similar to those described in Section 6.5.1.

Long-term/operational impacts

Long-term impacts from the operation of new off-channel storage facilities would be similar to those described in Section 6.19.1.

Environmental Health

Short-term impacts

Temporary construction-related impacts to workers due to increased noise levels and potential contact with hazardous substances could occur due to construction activities conducted as part of the implementation of this alternative. Short-term noise impacts to the public may also occur if the facility is located near a residential area. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Long-term/operational impacts

Failure of a dam or other off-channel storage facility may result in significant adverse public health impacts. Potential public health impacts associated with this alternative are similar to those described in Section 6.19.1, except that typical off-channel storage projects may be smaller in scale than on-channel projects and, therefore, have a lower risk of injury or loss of life if failure were to occur. However, off-channel projects may also be large and result in significant potential impacts on public health and safety. For example, the proposed Black Rock Reservoir in Benton County could store up to 1.7 million acre feet of water.

Operation of off-channel storage facilities may reduce the risk of downstream flooding by temporarily storing water during flood events. This would likely result in a beneficial health impact to the population downstream of the facility by reducing injuries and/or fatalities from flood events.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts on land and shoreline use associated with this alternative are similar to those identified in Section 6.19.1.

Long-term/operational impacts

Potential long-term impacts to land use associated with this alternative are similar to those described in Section 6.19.1. However, construction, operations, and maintenance costs can be higher for off-channel reservoirs than for on-channel reservoirs (Economic and Engineering Services, Inc. 2001). The higher costs of construction and operation may translate into higher costs for the water users (for example, costs for irrigation and municipal supply).

Potential beneficial long-term impacts of this alternative are that additional water resources would be made available for out-of-stream uses including irrigated agriculture and urban development. The reservoir could also be used to supplement stream flows during periods of low instream flow.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts to cultural resources would be similar to those described in Section 6.19.1.

Recreation

Short-term impacts

Short-term impacts from the operation of new off-channel storage facilities would be similar to those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts from the operation of new off-channel storage facilities would be similar to those described in Section 6.19.1.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction of water storage facilities are described in Section 6.19.1.

Long-term/operational impacts

Potential long-term impacts to transportation systems are described in Section 6.19.1.

Public Services and Utilities

Short-term impacts

Short-term impacts to public services and utilities would be similar to those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts to public services and utilities would be similar to those described in Section 6.19.1.

6.21.2 Mitigation Measures

Earth

Mitigation for impacts to earth resources associated with this alternative would be the same as those described in Section 6.19.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Mitigation measures for impacts on surface water quantity that are discussed in Section 6.19.2 are appropriate for this alternative as well. The effects of local soils and geology can be avoided through careful review of site conditions during project planning and the avoidance sites containing potential pollutants.

Mitigation measures for impacts on surface water quality are discussed in Section 6.19.2. Impacts to water quality can be reduced if site selection includes an analysis for those geologic characteristics that will minimize on-going turbidity and control erosion in the surrounding areas.

Ground Water

Mitigation measures for impacts to ground water associated with this alternative are the same as those discussed in Section 6.19.2.

Plants

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife

The mitigation measures described in Section 6.19.2 should be implemented to minimize adverse impacts to fish and wildlife. In addition, water chemistry tests should be conducted prior to water diversion to ensure reasonable compatibility and biological tolerance. Pre-treatment of water (for example, to control turbidity and/or salinity) may also be needed where soil conditions or storage retention time would result in a buildup of salts, or where estuarine waters may be affected. Pretreatment may also be used to address dissolved oxygen levels.

Energy and Natural Resources

Mitigation measures are described in Section 6.19.2. In addition, the project should be designed to balance the size and location of the storage facility to minimize the pumping requirements.

Scenic Resources and Aesthetics
Mitigation measures would be the same as those described in Section 6.19.2.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2. Mitigation measures to reduce long-term public health impacts are identified in Section 6.19.2.

Land and Shoreline Use
Potential mitigation measures are described in Section 6.19.2.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2. Mitigation measures for long-term operational impacts may include measures identified for short-term impacts, as well as site stabilization and monitoring.

Recreation
Mitigation measures would be the same as those described in Section 6.19.2.

Transportation
Potential mitigation measures for short-term and long-term impacts to transportation systems are described in Sections 6.1.2 and 6.19.2, respectively.

Public Services and Utilities
Mitigation measures for public services and utilities would be similar to those described in Section 6.19.2.

6.21.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth
Cumulative and significant unavoidable adverse impacts to earth resources associated with this alternative are the same as those discussed in Section 6.5.3.

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
The cumulative and significant unavoidable adverse impacts described in Section 6.19.3 are applicable to this alternative also. Further, if numerous facilities were built on the same stream, the impacts on stream flow and subsequent effects on water quality would be cumulative.

Ground Water
The cumulative and significant unavoidable adverse impacts described in Section 6.19.3 are applicable to this alternative also.

Plants
Cumulative and significant unavoidable adverse impacts are similar to those predicted in Section 6.19.3.

Wildlife
Cumulative and significant unavoidable adverse impacts are similar to those predicted in Section 6.19.3.

Energy and Natural Resources
The increased consumption of electrical energy to transfer the water to new storage facilities is a significant unavoidable adverse impact. This would be particularly important if many of these facilities are constructed and operated statewide. If multiple off-channel facilities were constructed across the state, cumulative impacts to energy and natural resources would be significant. A portion of these costs could be off-set by seasonal generation of power as described.

Scenic Resources and Aesthetics
Cumulative impacts under this alternative would be the same as those in Section 6.19.3.

Environmental Health
Cumulative and significant unavoidable adverse impacts to public health associated with construction are not predicted, due to the temporary, short-term nature of construction activities. Cumulative and significant unavoidable adverse impacts to public health associated with long-term operation of off-channel storage facilities are the same as described in Section 6.19.3.

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts to land and shoreline use are discussed in Section 6.19.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts under this alternative would be the same as those in Section 6.19.3.

Transportation
Potential cumulative and significant unavoidable adverse impacts associated with this alternative are the same as described in Section 6.19.3.

Public Services and Utilities
Cumulative impacts and significant unavoidable adverse impacts would be similar to those described in Section 6.19.3.

6.22 Alternative WP 22: Raise and continue to operate existing off-channel storage facilities.

6.22.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Sections 6.1.1, 6.19.1, and 6.20.1.

Long-term/operational impacts

Long-term impacts would be the same as those described in Section 6.19.1, if there is major construction associated with raising the off-channel storage facility.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts described for on-channel expansions in Section 6.20.1 would also apply to this alternative. In addition, the impacts described in Section 6.21.1 for new-off channel facilities would apply to expansions to a lesser degree depending on the extent of the expansion.

Short-term impacts on surface water quality would be similar to those described in Section 6.2.1.

Long-term/operational impacts

Long-term impacts to water quantity are similar to those described in Section 6.21.1, but to a lesser degree depending on the extent of the expansion. With regard to dam safety issues, impacts would be similar to 6.20.1 and 6.21.1.

If this alternative results in changes in stream flow downstream of the facility, there would be impacts to surface water quality similar to those described in Section 6.10.1.

Ground Water

Short-term impacts

Short-term impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts from implementation of this alternative would be the same as, but of lesser significance than those described in Section 6.19.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Impacts from operation of raised off-channel storage facilities are predicted to be similar to those described in Section 6.19.1.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Long-term impacts from operation of raised off-channel storage facilities are predicted to be similar to those described in Section 6.19.1.

Energy and Natural Resources

Short-term impacts

The short-term impacts are similar to those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.21.1.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from continued operation of existing off-channel storage facilities would be similar to those described in Section 6.5.1.

Long-term/operational impacts

Long-term impacts from continued operation of existing off-channel storage facilities would be similar to those described in Section 6.20.1.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers and the public could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Long-term/operational impacts

Failure of a dam or other off-channel storage facility may result in significant adverse public health impacts. Potential public health impacts associated with this alternative are similar to those described in Section 6.19.1 for on-channel structural modifications

Operation of off-channel storage facilities may reduce the risk of downstream flooding by temporarily storing water during flood events. This would likely result in a beneficial health impact to the population downstream of the facility by reducing injuries and/or fatalities from flood events.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts to land and shoreline use associated with this alternative are similar to those described in Section 6.19.1.

Long-term/operational impacts

Potential long-term impacts to land use associated with this alternative are similar to those described in Section 6.21.1.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Long-term operational impacts to cultural resources are expected to be similar to those described in Section 6.20.1.

Recreation

Short-term impacts

Short-term impacts from continued operation of existing off-channel storage facilities would be similar to those described in Section 6.20.1.

Long-term/operational impacts

Long-term impacts from continued operation of existing off-channel storage facilities would be similar to those described in Section 6.20.1.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Long-term/operational impacts

Potential long-term impacts to transportation systems are described in Section 6.19.1.

Public Services and Utilities

Short-term impacts

Short-term impacts to public services and utilities would be similar to those described in Section 6.19.1.

Long-term/operational impacts

Long-term impacts to public services and utilities would be similar to those described in Section 6.19.1.

6.22.2 Mitigation Measures

Earth

Mitigation for impacts to earth resources associated with this alternative would be the same as those described in Section 6.19.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Appropriate mitigation measures for water quantity impacts are described in Section 6.19.2 and for water quality impacts in Section 6.10.2.

Ground Water

Mitigation measures for impacts to ground water associated with this alternative are the same as those discussed in Section 6.19.2.

Plants

The mitigation measures described in Section 6.19.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife

The mitigation measures described in Section 6.19.2 should be implemented to minimize adverse impacts to fish and wildlife.

Energy and Natural Resources

Mitigation measures are described in Section 6.19.2.

Scenic Resources and Aesthetics

Mitigation measures would be the same as those described in Section 6.20.2.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2. Mitigation measures to reduce long-term public health impacts are described in Section 6.19.2.

Land and Shoreline Use
Potential mitigation measures for impacts to land and shoreline use are identified in Section 6.19.2.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2. Mitigation measures for long-term operational impacts may include measures identified for short-term impacts, as well as site stabilization and monitoring.

Recreation
Mitigation measures would be the same as those described in Section 6.20.2.

Transportation
Potential mitigation measures for short-term and long-term impacts to transportation systems are described in Section 6.1.2 and 6.19.2, respectively.

Public Services and Utilities
Mitigation measures would be similar to those described in Section 6.19.2.

6.22.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth
Cumulative and significant unavoidable adverse impacts to earth resources associated with this alternative are the same as those discussed in Section 6.5.3.

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
If numerous off-channel facilities were raised in the same watershed, the effects on stream flow and subsequent effects on surface water quality would be cumulative. Effective design of the expanded reservoirs should attempt to maximize capacity for the smallest surface area possible, which will minimize evaporative losses. Operating rule curves should be developed in conjunction with other watershed facilities to compensate for flow alteration. In addition, some of the cumulative and significant unavoidable adverse impacts could be offset by carefully coordinating operation schedules to ensure that high flow releases mimic the natural magnitude and sediment is released from facilities along with flushing flows.

Ground Water
Raising the level of existing off-channel storage facilities could permanently increase ground water recharge rates and ground water levels, in the vicinity of the storage facility. The impacts of this alternative on ground water levels are of a lesser magnitude than that described for creation of a new off-channel storage facility. However, the magnitude of the impacts of implementing this alternative would also depend on the local hydrogeologic situation (for example, reservoir permeability and water table elevation) and on the degree to which the level of the storage facility is raised.

Plants
Cumulative and significant unavoidable adverse impacts are similar to, but of less magnitude than, those predicted in Section 6.19.3.

Wildlife
Cumulative and significant unavoidable adverse impacts are similar to, but of less magnitude than, those predicted in Section 6.19.3.

Energy and Natural Resources
The cumulative and significant unavoidable adverse impacts are similar to those described in Section 6.21.3.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same those described in Section 6.20.3.

Environmental Health
Cumulative and significant unavoidable adverse impacts associated with long-term operation of off-channel storage facilities are the same as described in Section 6.19.3.

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts to land and shoreline use are discussed in Section 6.19.3.

Cultural Resources
Cumulative impacts would be similar to those identified in Section 6.1.3. Significant unavoidable adverse impacts to archaeological resources may result from erosion and inundation of resources.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same those described in Section 6.20.3.

Transportation
Potential cumulative and significant unavoidable adverse impacts associated with this alternative are the same as described in Section 6.19.3.

Public Services and Utilities
Cumulative and significant unavoidable adverse impacts associated with this alternative would be similar to those described in Section 6.19.3.

6.23 Alternative WP 23: Extend use of existing storage facilities to additional beneficial uses.

6.23.1 Impacts

Earth

Short-term impacts

If the extension of beneficial use entails converting a hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts similar to those described in Sections 6.1.1, 6.19.1, and 6.20.1.

Air

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts to air quality similar to those described in Section 6.1.1.

Surface Water

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts to water resources similar to those described in Section 6.1.1.

Long-term/operational impacts

The addition of beneficial uses of water from a reservoir or other storage facility may reduce return flows if new consumptive uses are allowed from a facility that was previously allocated for recreation, power, instream flow, or other non-consumptive uses. This impact may be significant. Also, unanticipated dam safety issues may arise. Evaluation on a case-by-case basis would likely be required.

Long-term effects on surface water quality from allocating water from existing storage facilities to additional beneficial uses could be variable and dependent upon the current allowable uses and the newly added beneficial uses. The addition of beneficial uses of water from a reservoir or other storage facility may reduce return flows if new consumptive uses are allowed from a facility that was previously allocated for non-consumptive uses, such as recreation, power, or instream flow. This impact may be significant and would depend upon the amount of water allocated relative to the available volume of water.

The addition of recreational use or stock watering adjacent to a reservoir currently permitted for drinking water only may result in decreases in water quality. Closed waters, like the watersheds of the Cities of Seattle and Tacoma, limit the types of land use that can affect water quality. Watersheds, which are open to other uses, such as Lake Whatcom and the City of Everett's reservoir, have a potential to be affected by other land uses. The degree of effect would be dependent upon the type of use allowed and the extent of use. Some uses, such as swimming, fishing, and canoeing, may have little effect if the number of users is few and/or sufficient restroom facilities are provided. Management of water quality situations would tend to be more challenging in systems that are popular recreational areas. If new recreational uses include the use of motorboats, oil and gas may also be introduced into the water body.

Likewise, the effects of residential development, grazing, and other land uses on water quality can also affect water quality in water systems. Residential development may introduce chemicals from lawns and potentially some septic leakage into a water system. Grazing can increase nutrient loads. The extent of potential impact to water quality would be directly related to the extent of use. A few homes or a few cattle are much less likely to result in significant effects than are extensive residential developments or concentrations of livestock.

The preceding paragraphs focus on the addition of beneficial uses to systems used for drinking water. Other situations have a lower potential for affecting water quality. For instance, adding stock watering as a beneficial use for a facility currently permitted for irrigation is unlikely to have a significant affect on water quality. Likewise, the addition of hydropower facility to an impoundment that provides water for irrigation is unlikely to have significant effects on water quality. In situations where drinking water is added as a beneficial use, improvements in water quality may be achieved through the introduction of source protection measures. Therefore, water quality may be either improved or degraded depending upon the change that is implemented. The significance of changes in allowed beneficial uses would be dependent upon the quantity of pollutants that are introduced or removed to a water body as a result in the change in allowed beneficial use.

Ground Water

Short-term impacts

If the extension of beneficial use includes significant construction activities (for example, converting hydropower facility to provide drinking water supply which might involve construction of diversion structures) it may result in short-term construction-related impacts to ground water due to ground water control activities similar to those described in Section 6.19.1.

Long-term impacts

Long-term impacts to ground water could occur if the extension of beneficial uses includes converting or augmenting surface water storage with aquifer storage. Aquifer recharge and storage could include injection wells or other artificial means of recharge for subsequent withdrawal. Under this scenario, ground water levels in the vicinity of the recharge project are likely to increase.

Plants

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts to plant communities similar to those described in Section 6.1.1.

Long-term/operational impacts

No adverse long-term impacts to plant communities are predicted from this alternative. A positive impact could occur if water in storage facilities constructed for out-of-stream consumptive uses would remain instream, expanding riparian habitat.

Wildlife

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts to aquatic and wildlife communities similar to those described in Section 6.1.1.

Long-term/operational impacts

No adverse long-term impacts to fish and wildlife are predicted from this alternative. A positive impact could occur if water in storage facilities constructed out-of-stream consumptive uses would be retained instream, improving flow for fish and other aquatic life.

Energy and Natural Resources

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts similar to those described in Section 6.1.1.

Long-term/operational impacts

Some existing storage facilities are equipped for hydropower generation. If this alternative is implemented, water is spilled over the dam in order to maintain instream flows for fish migration at certain times of the year. Spilling water for this use reduces the amount of hydropower that can be produced. Using stored water for uses other than hydropower (for example, irrigation and industrial process water) can also reduce the amount of power produced.

Scenic Resources and Aesthetics

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts to viewscape similar to those described in Section 6.1.1.

Environmental Health

Short-term impacts

If the extension of beneficial use entails converting a hydropower facility to provide drinking water, construction of a diversion structure could result in short-term impacts to worker health and safety similar to those described in Section 6.1.1.

Long-term impacts

Unanticipated dam safety regulatory and impact concerns may require evaluation on a case-by-case basis.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative may result in long-term impacts to land use. Increasing the number of competing beneficial uses without increasing existing capacity may result in less water available for out-of-stream uses (such as agricultural or municipal supply) and more for instream uses (such as recreation and fisheries). For example, extending use of a reservoir to recreational uses such as fishing or boating may result in a need to maintain water levels at a specified level, thus reducing the amount of water available for removal from the reservoir for use in agriculture. Conversely, if the existing use is expanded from recreation to municipal supply, uses such as motor boating may be curtailed to protect drinking water quality.

Cultural Resources

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in potential short-term impacts to cultural resources similar to those described in Section 6.1.1.

Recreation

Short-term impacts

If the extension of beneficial use entails converting hydropower facility to provide drinking water supply, construction of a diversion structure would result in short-term impacts similar to those described in Section 6.1.1.

Short-term benefits could include additional area for water-based recreation activities. However, a large volume of water would be required to increase recreation opportunities substantially.

Long-term/operational impacts

If the change in beneficial use involves leaving more water in a reservoir or instream, water-oriented recreational opportunities could be enhanced. Conversely, water-based recreational opportunities may be reduced or eliminated if an existing storage facility were designated solely for drinking water use with source water protection measures in effect.

Public Services and Utilities

Short-term impacts

Changes in beneficial use would require permitting by Ecology. Should the changes in beneficial use affect operation of a public water system, approval from the Department of Health would likely be required and the public water system's water system plan may need to be updated.

If the change in use involves construction of new diversion structures, federal, state, and local permits for in-water or shoreline construction activities may be required. If the diversion structures or other capital improvements needed to implement the alternative were to be undertaken by a public utility or other public entity, associated costs may need to be borne by rate payers or users, or offset by an appropriation of public funds.

6.23.2 Mitigation Measures

Surface Water

The appropriate mitigation measures for surface water quality effects will be dependent upon the change in use. Proposed changes in use should be reviewed and any potential effects on water quality identified. Effects may be mitigated by limiting use (for example, limiting or excluding motor boat use on lakes), implementing source control measures to protect municipal supplies, or by controlling methods of use (for example, requiring off site watering of animals). Appropriate mitigation should be identified on a project-specific basis.

Energy and Natural Resources

Where additional out-of-stream beneficial uses are planned for existing facilities using water for hydropower generation, alternative uses of stored water should be planned during periods when power consumption is in a low demand mode. Alternative uses may need to be curtailed when power production is in high demand.

Land and Shoreline Use

Additional beneficial uses should be compatible with jurisdictional land use plans, water and sewer general plans, and irrigation plans.

Recreation

Increased out-of-stream use may adversely affect water-related recreational opportunities. Additional withdrawals for out-of-stream use should be carefully planned to minimize impacts on recreation.

6.23.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

This alternative may result in permanent minor changes to timing of stream flow regimes in a basin, particularly if many of these actions are taken in a single basin.

Actions taken under this alternative may result in cumulative effects on surface water quality if several actions are implemented in one basin. The magnitude of effects will depend upon the changes in beneficial uses that are supported.

Plants

This alternative may have a net cumulative positive impact to riparian ecosystems if additional water is added to benefit wetland and aquatic resources.

Wildlife

This alternative may have a net cumulative positive impact to fish and wildlife if additional water is maintained instream to benefit aquatic resources and their habitat.

Energy and Natural Resources

This alternative could cause a cumulative and significant unavoidable adverse impact to power availability, if water currently used to generate hydropower were diverted for other consumptive uses. Under those conditions and at times of peak demand, the state's existing power generating facilities cannot keep up with demand and power is purchased from out-of-state generators or private generators. These facilities are typically gas-powered turbine generators that produce significant air emissions. Further decreasing the power-generative capability would likely result in higher energy costs to consumers.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Land and Shoreline Use
Implementation of this alternative on a statewide basis may result in a reduction in water quantity available for out-of-stream uses, and therefore minor cumulative or unavoidable adverse impacts to land and shoreline use.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

6.24 Alternative WP 24: Construct and operate artificial recharge/aquifer storage projects.

6.24.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Long-term/operational impacts

Long-term impacts would be the same as those described in Section 6.5.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts to surface water resources may occur during construction of facilities. Those effects are described in Section 6.1.1.

Long-term/operational impacts

Aquifer recharge/storage may decrease surface water temporarily with corresponding increases in baseflows over time as depleted ground water sources are replenished. On the other had, if aquifer recharge is through deep injection, baseflows may not be affected. Secondary effects may include evaporative losses if recharge is by ponds, trenches, or land spreading. Additional changes in the timing of ground water surface water exchange may be experienced.

The impacts of increased baseflows and, therefore, surface flows on water quality are described in Section 6.1.1. If the quality of the recharge water is lower than the local ground water, degradation of water quality may occur. Secondarily, degradation of surface water quality could occur under these circumstances; however surface water quality degradation would likely be less than that of ground water due to the effect of dilution by surface flow.

Ground Water

Long-term/operational impacts

Implementation of this alternative would likely result in increased ground water levels or hydraulic heads in the aquifer being recharged. Increased ground water levels or hydraulic heads would increase gradients and ground water discharge which could lead to increased base flow in hydraulically connected streams. This alternative could also negatively impact ground water quality if the water used for recharge is of lower quality than the existing ground water.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The long-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

The short-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The long-term impacts to wildlife are predicted to be similar to those described in Section 6.2.1.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers and the public could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Long-term/operational impacts

Assuming compliance with Ground Water Quality Standards (WAC 173-200), no long-term impacts to environmental health are associated with this alternative.

Land and Shoreline Use

Short-term impacts

Implementation of this alternative could result in short-term impacts to land use if property acquisition is necessary to construct an artificial recharge/aquifer storage project.

Long-term/operational impacts

Ownership and/or management of lands in the vicinity of the aquifer recharge area may be required, similar to wellhead protection areas (Economic and Engineering Services, Inc. 2001). Beneficial impacts may also result from implementation of this alternative, in that additional water resources may be available for out-of-stream uses including irrigated agriculture and urban development.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Implementation of this alternative would require permitting by Ecology and Department of Health. The extent of permitting would depend on the magnitude and complexity of the project.

Significant levels of funding would be needed by the implementing agency or entity for feasibility studies, permit application, project design, and project construction.

Long-term/operational impacts

Potential long-term impacts include increases in water utility rates due to the construction and operation costs of the aquifer storage system.

6.24.2 Mitigation Measures

Earth

Mitigation for impacts to earth resources associated with this alternative would be the same as those described in Section 6.5.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Potential effects on surface water resources could be mitigated by minimizing the area of construction-related disturbance and by controlling the long-term quality of the recharge water. Additionally, withdrawals should be limited to times when flows are adequate to meet instream needs.

Ground Water

Potential unacceptable changes in base flows could be avoided by conducting appropriate hydrogeological studies to predict any adverse effects prior to implementing the changes. In cases where such impacts would be likely, rates and locations of artificial recharge could be modified.

Potential impacts to ground water quality from the introduction of contaminated water could be minimized through proper system design so that water from potentially contaminated sources is not used to recharge ground water. In addition, periodic monitoring of source water and ground water quality would help ensure that contaminated water is not being introduced to ground water.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2.

Cultural Resources
Mitigation measures for construction impacts would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
Potential mitigation for public services and utilities would be similar to that described in Section 6.19.2.

6.24.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Stream flow regimes may be temporally altered depending on the operation of the recharge project or multiple projects in the same basin. If the artificial recharge occurs in a basin other than its originating basin, then the base flows to the streams in the originating basin may be decreased and to the receiving basin may be increased.

There are no expected cumulative impacts or significant unavoidable adverse impacts to surface water quality from this alternative unless several recharge projects are developed that recharge the same aquifer. If several projects are developed the impacts would be cumulative.

Ground Water
Assuming proper design and/or mitigation measures, no cumulative impacts or significant unavoidable adverse impacts to ground water resources associated with this alternative would be predicted should it be implemented on a regional or statewide basis.

Land and Shoreline Use
Where artificial recharge projects are of a significant size, they may support additional urban development and its accompanying impacts.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Public Services and Utilities
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.19.3.

6.25 Alternative WP 25: Take no action regarding water quantity.

6.25.1 Impacts

Surface Water

Long-term/operational impacts

Taking no action may result in an inability to meet future water demands for both instream and out-of-stream needs. Taking no action in regard to water quantity leaves many resource management concerns unanswered in basins where water resources have apparently become limiting. This alternative may result in diminished stream flows from exempt well use in areas where wells are hydraulically connected to surface water. Taking no action might also result in reduced stream flows in over-appropriated or heavily appropriated basins. Continued use of illegal or unpermitted water may perpetuate low flow problems that may currently exist. Continued growth and allocation of water rights under existing programs may result in continued decreases in stream flow. The extent of such impacts will be influenced by existing local, state, and federal rules and regulations that address land use and environmental effects. The effects of decreases in flow on water quality are described in Section 6.1.1. The magnitude of decreases may be highly variable, depending upon future changes in demand.

Ground Water

Long-term/operational impacts

Taking no action regarding water quantity in a basin may not provide for effective management of ground water resources. For example, basins that are currently experiencing declining ground water levels might be expected to experience continued decline under existing management practices. In addition, areas experiencing a proliferation of exempt wells could experience overuse of ground water. The magnitude of potential ground water impacts would depend on current aquifer recharge, the existing quantity and pattern of ground water use, future population growth, and the effectiveness of existing water management efforts.

Plants

Long-term/operational impacts

Taking no action may result in altered species composition and/or function to those riparian habitats where substantial amounts of water continue to be diverted to out-of-stream uses.

Wildlife

Long-term/operational impacts

Taking no action may result in altered species composition and/or function to those aquatic organisms where substantial amounts of water continue to be diverted to out-of-stream uses, such as those streams where spawning and rearing habitat has been reduced due to low water quantity.

Scenic Resources and Aesthetics

Long-term/operational impacts

In areas with adequate flow and water quality, no impacts to scenic resources and aesthetics would occur, as presumably the area would support healthy habitat. However, in other areas where flow and water quality are inadequate, failure to properly manage water quantity may prevent restoration of some scenic resources and aesthetics associated with rivers and other bodies of water.

Land and Shoreline Use

Long-term/operational impacts

Taking no action with regard to water quantity may result in insufficient availability of water resources to provide for planned growth, possibly necessitating amendment of land use plans and water/sewer general plans. Options for residential, commercial, industrial, and agricultural land uses may be restricted. In addition, the region's ability to withstand drought may be lessened.

Cultural Resources

Long-term/operational impacts

Failure to provide water to restore or enhance instream resources may result in adverse effects to bodies of water with cultural or traditional significance, depleting fish habitat and impacting traditional use.

Recreation

Long-term/operational impacts

In lakes and rivers with good water quality, recreational opportunities may not be affected. However, in lakes and streams with poor water quality, adequate water quantity would help provide habitat to restore or enhance healthy fish populations thus increasing recreational opportunities.

Stream flows support many types of recreation use such as kayaking, canoeing, swimming, and fishing. Current flows in streams may not be adequate to support these types of recreational opportunities. Continued decreases in stream flows may reduce recreation opportunities in the area.

Transportation

Long-term/operational impacts

Implementation of this alternative may contribute to decreases in water levels in navigable waterways over time. Ultimately, this may impact the ability of navigable streams/rivers to support navigation. Commercial and recreational navigation could potentially be affected.

Public Services and Utilities

Long-term/operational impacts

Under this alternative, communities would forgo the opportunity for local development of watershed plans under Chapter 90.82 RCW. In such communities, reliance would primarily be placed on existing statewide policies and regulatory programs for management of water resources and protection of existing water rights. Past efforts to manage water resources through statewide planning as well as through implementation of statewide policies and regulations have generally been unsuccessful because such efforts failed to account for local variability in socioeconomic, political, and natural resource conditions.

6.25.2 Mitigation Measures

The "No Action" alternative assumes that water quantity would continue to be managed through the existing framework of federal, state, local, and tribal programs, and water user practices. In some water resource inventory areas, existing systems may be adequate to provide for all water needs. In other water resource inventory areas, significant impacts may be experienced or continue to be experienced without implementation of additional mitigation measures.

6.25.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Cumulative impacts and significant unavoidable adverse impacts for this alternative may include permanent reductions to stream flow. In addition, valid water rights may be adversely affected with the "No Action" alternative.
Changes in land use and use of water over time may have cumulative effects on surface water quality. The magnitude and direction of change in water quality will be variable and dependent upon numerous factors affecting growth, water demand, water use, and implemented measures to control those affects.

Ground Water
The cumulative impacts of taking no action regarding water quantity statewide would not provide for effective management of ground water resources. For example, regions that are currently experiencing declining ground water levels might be expected to experience continued decline under existing management practices. Regions of the state where exempt wells are proliferating could experience overuse of ground water.

Plants
This alternative may result in degradation of riparian or upland habitats in some watersheds if no action is taken to return water to instream uses. Further impacts to the habitats of threatened and endangered species may also occur.

Wildlife
This alternative may result in degradation of aquatic and wildlife habitat and use in some watersheds. Low water quantities may exacerbate conditions (e.g., insufficient water in spawning beds or for migration) used by threatened, endangered, or sensitive species.

Scenic Resources and Aesthetics
Cumulative impacts could occur to scenic resources and aesthetics if other projects in the area affect the landscape. Reductions in flows in watersheds across the state could hinder scenic resources and aesthetics restoration under this alternative.

Land and Shoreline Use
While this alternative may not result in cumulative impacts for an individual watershed, implementation of this alternative statewide could result in cumulative and unavoidable adverse impacts to land by contributing to a reduction in water availability for instream and out-of-stream uses.

Cultural Resources
Significant unavoidable adverse impacts may result from failure to provide water to restore or enhance instream resources in multiple bodies of water over time, depleting fish habitat and impacting traditional use.

Recreation
Cumulative impacts could occur to recreational resources if other projects in the area affect recreation access and use. A reduction in flows across the state could hinder float boating opportunities and reduce the quality of the recreational experience.

Transportation
This alternative could result in cumulative and unavoidable adverse impacts to commercial and recreational navigation by contributing to the decline in water levels in currently navigable waterways in Washington.

Public Services and Utilities
In some watersheds in which watershed planning under Chapter 90.82 RCW will not occur, state agencies will continue with the difficult task of attempting to apply statewide policies and regulations to manage local water resources.

INSTREAM FLOW ALTERNATIVES

6.26 Alternative WP 26: Request Ecology to set instream flows by administrative rule (in the Washington Administrative Code, or WAC).

6.26.1 <u>Impacts</u>

Surface Water

Long-term/operational impacts

Establishment of instream flow levels does not guarantee that stream flow levels will be unimpaired or restored. Instream flow levels are used by Ecology to condition future surface water uses, assuring that future appropriations do not degrade surface waters of the state. Additionally, Ecology uses instream flows to condition water right permits that might be in hydraulic continuity with the stream where instream flows have been set. Therefore, establishment of instream flows will minimize negative impacts to surface water resources related to future water uses since such uses will be conditioned to require cessation of diversions when stream flow levels are no longer at or above the established instream flow levels.

However, instream flow levels cannot be used by Ecology to regulate against permitted uses with a priority date senior to the date of establishment of instream flows, or to regulate surface water uses under a water right claim. Given these limitations, restoration of instream flows must be accomplished through actions such as those described in the Water Quantity alternatives including, but not limited to:

> Alternative WP8 – Request Ecology to transfer existing water rights for out-of-stream beneficial uses acquired through purchase, lease, voluntary methods, or condemnation to instream beneficial uses through the state's Trust Water Right Program (see Section 6.8.1); and
>
> Alternative WP-11 – Request Ecology to adopt a rule to close or partially close a basin or subbasin (see Section 6.11.1).

Ground Water

Long-term/operational impacts

The establishment of instream flows may limit the availability of surface water for future appropriation or may place conditions on future appropriations that would be difficult to meet or would not fit well with a proposed development scenario. This may result in increased pressure for development of ground water resources in the long term.

Allocation of ground water resources could also be affected by adoption of an instream flow rule if the stream is in hydraulic continuity with ground water (for example, closure of a basin or subbasin to protect instream flow). The degree of impact on ground water appropriations would depend on the extent of hydraulic continuity between the aquifer and the stream.

Plants

Long-term/operational impacts

The impacts of this alternative on plant resources (for example, riparian vegetation) are dependant upon other actions that may be taken in response to or in conjunction with establishment of instream flows. For example, Alternative WP 8, described, would be intended to put more water instream and may have a positive impact on riparian plant communities. Similarly, habitat improvement projects such as WP 47, which involves conducting modifications to riparian habitat, would likely have positive impacts on plant communities (see Section 6.47).

Wildlife

Long-term/operational impacts

Instream flows are used by Ecology to limit future appropriations of water from impairing aquatic resources, including habitat for fish and other aquatic organisms. Therefore, by definition, the instream flow level is attempting to achieve a "no impact" condition for aquatic resources such as fish habitat.

Long-term impacts to habitat, both positive and negative, may result from a variety of the alternatives identified for Water Quantity, Water Quality, and Habitat. Fish habitat metrics (for example, weighted useable area (WUA) relations and habitat time-series relationships) developed using the Instream Flow Incremental Methodology (IFIM), commonly used to develop instream flow recommendations, can be used to assess the cumulative, long-term impacts from implementation of the various Water Quantity, Water Quality, and Habitat alternatives as they apply to individual stream reaches in a watershed. PHABSIM and habitat time-series analysis should be augmented with water quality assessment tools like SSTEMP (Stream Segment Temperature Model) or SNTEMP (Stream Network Temperature Model) when assessing the long-term cumulative impacts associated with implementation of projects. Additionally, careful consideration must be given to short-term and long term impacts of projects on fluvial geomorphological and biological processes, as PHABSIM assumes channel geomorphological and biological metrics as representative of the modeled interval unless otherwise specified. By taking these factors into account, and by using these and other monitoring tools, watershed-based project implementation, status/trend, and effectiveness monitoring can help watershed groups determine relationships between instream flows, projects, and potential long-term impacts (either positive or negative) on wildlife.

Scenic Resources and Aesthetics

Long-term/operational impacts

Instream flows are used by the Department of Ecology to limit future permitted water uses from impairing aquatic resources, including the scenic and aesthetic values of stream flow. Therefore, establishing instream flows would help maintain scenic resources and aesthetics in their current state, but would not necessarily result in restoration of degraded resources.

Land and Shoreline Use

Long-term/operational impacts

Establishing instream flows may limit the potential for obtaining new water rights from an affected water body. In such cases, the lack of available water may limit or alter the nature of new development. Where water supplies cannot be obtained from another source or “created” through water use efficiency measures, comprehensive land use plans may need to be amended.

Cultural Resources

Long-term/operational impacts

This alternative will not directly result in improvement or degradation of cultural resources, including streams that may have cultural significance to Tribes and others. However, establishment of instream flows would help maintain cultural resources in their current state.

Recreation

Long-term/operational impacts

Establishment of instream flows would help maintain recreational activities at their current levels. However, this alternative would not directly restore recreational opportunities that have been degraded as a result of diversions under existing rights and claims. Restoration would require other actions to occur, such as Alternative WP 8, described, that is intended to put more water instream and various Habitat alternatives described in this chapter.

Public Services and Utilities

Short-term impacts

Establishment of instream flows could result in new appropriations for municipal and domestic water uses being subject to requirements for maintaining higher instream flow levels. New hydroelectric projects would need to be sized to pass higher instream flows, which could render some projects impractical

Short-term (and long-term) impacts of setting an instream flow either higher or lower than existing conditions will vary depending on the specific site. Some modifications of diversion facilities, bridge footings, utility lines, access roads or other features may be needed.

Establishing instream flows will usually require considerable commitment of Departments of Fish & Wildlife and Ecology staff resources. Instream flow studies will either need to be done or, if existing, reviewed and possibly supplemented. The studies must then be reviewed in the context of the specific stream and other variables that may need to be considered, and a flow regime determined. The rule-making process itself usually lasts about 18 months, involving timely filing of forms, State Environmental Policy Act compliance, holding public hearings, and responding to public comments. Since instream flows can be contentious, additional time may be required to establish them in rule. In addition, once rule making is proposed for a stream, there may be an increase in permit applications received by Ecology from persons seeking to receive a priority date before the date of adoption of the rule.

Local governments may need to modify their comprehensive land use plans if establishment of an instream flow adversely impacts the projections water resource availability upon which such plans are predicated.

Long-term/operational impacts

Proposed instream flows are frequently challenged with some legal action from any number of interest groups. Resolution of the challenge in a court of law tends to be a long-term, rather than a short-term impact. There is typically significant impact to Ecology legal, policy, and technical staff time. Furthermore, once instream flows have been established and upheld in a court of law, decisions made based upon those instream flows are often challenged, resulting in further long-term legal, policy, and technical staff-time costs.

6.26.2 Mitigation Measures

Surface Water

Potential negative impacts of this alternative (that is, reduced availability or the perception of reduced availability of surface water) could be mitigated by prospective water users by employing a number of alternative surface water or ground water sources. A prospective water user could purchase existing rights and have them transferred. A prospective water user could pay for efficiency improvements as described in Alternatives WP 1 through WP 7 (see Sections 6.1 through 6.7) in return for utilization of all or a portion of the saved water. In addition storage improvements as described in alternatives WP 19 through WP 23 (see Sections 6.19 through 6.23) could be considered.

Ground Water

Potential negative impacts of this alternative could be mitigated through the measures described for Surface Water.

Land and Shoreline Use

Potential negative impacts of this alternative could be mitigated through the measures described for Surface Water.

Public Services and Utilities

A monitoring program could be developed for specific projects to identify baseline information, keep track of changes and analyze the effects of those changes on the resource (e.g. water level relative to a diversion).

6.26.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

Should established flows reduce the amount of water available for out-of-stream uses, implementation of this alternative in multiple watersheds could reduce development on a regional or statewide scale.

6.27 Alternative WP 27. Take no action regarding instream flows.

Note: The significant adverse impacts described below are most likely to occur when decisions against recommending setting of instream flow are not based on consideration of actual water resources condition and need.

6.27.1 Impacts

Surface Water

Long-term/operational impacts

Taking no action concerning instream flows may create or increase the risk of gradual, incremental degradation streams and habitat and may increase the likelihood of stream closures.

Wildlife

Long-term/operational impacts

Taking no action concerning instream flows may create or increase the risk of gradual, incremental degradation of aquatic habitat.

Scenic Resources and Aesthetics

Long-term/operational impacts

This alternative could result in impairment or increased impairment of scenic resources.

Cultural Resources

Long-term/operational impacts

This alternative could result in degradation or increased degradation of streams with cultural significance to Tribes and others.

Recreation

Long-term/operational impacts

Degradation or increased degradation of stream flows could impair some recreational activities (for example, flows may fall below the point where kayaking or white water rafting is no longer practical) while other recreational activities could be enhanced (for example, swimming may be possible in a river where high flows previously precluded that activity).

Public Services and Utilities

Long-term/operational impacts

The lack of established instream flows may exacerbate difficulties associated with issuance of surface water rights because flows are a factor in water use decisions.

6.27.2 Mitigation Measures

Mitigation for this alternative would consist of continued operation of existing federal, state, and local laws, regulations, and programs for managing water resources.

6.27.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

For surface water, ground water, plants, wildlife, scenic resources, cultural resources, and recreation, this alternative may result in or contribute to incremental degradation of stream flows and habitat.

6.28 Alternative WP 28: Request local governments to construct and operate water reclamation and reuse facilities (e.g., reclamation plants and use areas) to reduce wastewater discharges to surface water bodies and improve water quality in such waters.

6.28.1 Impacts

Short and long-term impacts associated with construction and operation of water reclamation and reuse facilities were described previously in Section 6.5.1 for all media.

6.28.2 Mitigation Measures

Mitigation measures for impacts associated with construction and operation of water reclamation and reuse facilities were described previously in Section 6.5.2 for all media.

6.28.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Cumulative impacts and significant unavoidable adverse impacts associated with this alternative were discussed previously in Section 6.5.3.

6.29 Alternative WP 29: Request Ecology to implement and operate a pollution trading (credit) system for water in order to facilitate compliance with a total maximum daily load (TMDL).

6.29.1 Impacts

Surface Water

Long-term/operational impacts

Implementation of this alternative may reduce contaminant loading to surface water in areas currently affected by contaminants, but pollution trading could increase loading and pollutant releases where none or little currently exist. Both the timing and the spatial distribution of contaminant releases may be affected. Pollution trading may, in fact, result in the transfer of pollutant loads from one basin to another. No long-term impacts are predicted for surface water quantity. However, the objective of such a program is to reduce the overall pollutant loading to the environment.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce contaminant loading to ground water by reducing the average contaminant concentrations in waters that recharge ground water. The magnitude of this potential impact would depend on the degree to which the pollution trading system reduced contaminants in recharge water. On the other hand, pollution trading may adversely impact ground water if pollutants currently released to the surface water are proposed for release to the ground. Similarly, pollutant releases may be moved spatially to impact currently unaffected ground water. However, the objective of pollution trading programs is to reduce the overall pollutant loading to the environment.

Land and Shoreline Use

Long-term/operational impacts

This alternative may result in long-term land use impacts by allowing for increased growth of some activities and a potential reduction of others. Operation of a pollution trading system may allow for development that would otherwise be precluded due to water quality concerns. Conversely, pollution trading may result in higher transaction costs if some pollutant generating activities are required to retrofit with pollution controls to meet newer, more stringent standards.

Public Services and Utilities

Short-term impacts

Ecology would need to commit resources to develop a pollution trading system and to market the system to the regulated community.

Long-term/operational impacts

Implementation of a pollution trading system would require an ongoing commitment of resources within Ecology.

6.29.2 <u>Mitigation Measures</u>

Surface Water
Proposals for pollution trading should be reviewed carefully to ensure that surface water quality is not significantly and adversely affected in the trade, and to ensure that the state standard of "all known, available, and reasonable methods of prevention, control, and treatment" are applied.

Ground Water
Proposals for pollution trading should be reviewed carefully to ensure that ground water quality is not significantly and adversely affected in the trade, and to ensure that the state standard of "all known, available, and reasonable methods of prevention, control, and treatment" are applied.

Public Services and Utilities
As the pollution trading system is put into operation and Ecology, regulated industries, and the public become familiar with it, the level of Ecology resources needed to operate the system may diminish over time.

6.29.3 <u>Cumulative Impacts and Significant Unavoidable Adverse Impacts</u>

Surface Water
Implementation of this alternative could have the net positive impact of decreasing contaminant loading to surface waters of the state.

Ground Water
Implementation of this alternative could have the net positive impact of decreasing contaminant loading to ground waters of the state.

Land and Shoreline Use
If this alternative is implemented on a broad scale throughout the state, it could alter land use patterns by allowing for uses that might otherwise be precluded.

Public Services and Utilities
The impacts to Ecology associated with implementation of a pollution trading system would be cumulative with impacts associated with that department's other responsibilities and obligations.

6.30 Alternative WP 30: Request Ecology to incorporate requirements for improving the quality of discharges from existing industries when issuing State Waste Discharge Permits or National Pollutant Discharge Elimination System Permits.

6.30.1 Impacts

Surface Water

Long-term/operational impacts

This alternative may have the positive impact of reducing contaminant loading to surface water by directly reducing allowable inputs.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce contaminant loading to ground water by reducing the average contaminant concentrations in waters that recharge ground water. The magnitude of this potential impact would depend on the degree to which more stringent permit limits reduce contaminants in recharge water.

Wildlife

Long-term/operational impacts

This alternative may assist in improving water quality for fish and aquatic organisms.

Energy and Natural Resources

Long-term/operational impacts

Implementation of this alternative may result in higher energy consumption depending on the energy requirements of upgraded or new treatment systems necessary to meet permit requirements and the state's best available technology standard.

Environmental Health

Long-term/operational impacts

No significant adverse long-term impacts to environmental health are predicted for this alternative. Potential beneficial impacts include the improvement of water quality, allowing water-contact recreational uses in some water bodies not currently supporting this use.

Land and Shoreline Use

Short-term impacts

Requirements for improving the quality of discharges from existing industries would result in short-term capital cost impacts to affected industries.

Long-term/operational impacts

This alternative could result in long-term impacts to land use because it may result in an increase in operational costs associated with contaminant control for affected industries.

Public Services and Utilities

Short-term impacts

May increase costs to Ecology for processing State Waste Discharge Permits or National Pollutant Discharge Elimination System Permits.

6.30.2 Mitigation Measures

Energy and Natural Resources

When requiring treatment system upgrades or new installation, Ecology should promote the consideration of energy efficient treatment systems.

6.30.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

Implementation of this alternative in areas with numerous State Waste Discharge Permits or National Pollutant Discharge Elimination System Permits (NPDES) would likely result in cumulative improvement in surface water quality.

Ground Water

Implementation of this alternative in areas with numerous NPDES and or state waste discharge permits will result in cumulative improvement in ground water quality.

Land and Shoreline Use

Improvements in the quality of permitted discharges would likely result in increased treatment costs.

Public Services and Utilities

The impacts to Ecology associated with implementation of this alternative would be cumulative with impacts associated with that department's other responsibilities and obligations.

6.31 Alternative WP 31: Request Ecology to increase the level of inspection of commercial dairy operations and enforcement of water quality as appropriate.

6.31.1 Impacts

Air

Long-term impacts

Increased inspection of commercial dairy operations may have the secondary benefit of decreasing odor from proper improved manure handling practices.

Surface Water

Long-term/operational impacts

Increased inspection and enforcement of water quality provisions may reduce pollutant loads. The magnitude of effect will depend upon the level of enforcement and the amount that the pollutant load is reduced.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce contaminant loading to ground water should the increased level of inspection lead to a decrease in infiltration of farm waste to ground water. The magnitude of this potential impact would depend on the existing contribution of such waste to ground water contamination and the degree to which increased inspection would reduce these contributions.

Wildlife

Long-term/operational impacts

If inspections identify non-compliance with water quality criteria or permit conditions, and enforcement actions result in compliance, aquatic resources may be improved. For example, decreasing nutrient loading to a water body may decrease biological productivity and increase oxygen concentrations in the water, thereby increasing oxygen availability to fish and aquatic species.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative may result in long-term impacts to land use by increasing the operational costs associated with commercial dairies.

Public Services and Utilities

Long-term/operational impacts

In order to implement this alternative, Ecology would likely need to obtain additional resources for inspection and enforcement or to shift resources from another program area.

6.31.2 Mitigation Measures

Land and Shoreline Use
Increased costs to dairy farm owners may be offset by cost-share programs administered by the Natural Resources Conservation Service and conservation districts. Cost impacts may also be mitigated through technical assistance provided by conservation districts to help owners/operators of commercial dairies comply with regulatory requirements.

6.31.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Implementation of the alternative in areas where there are multiple dairies may cumulatively improve the quality of surface water.

Ground Water
Implementation of the alternative in areas where there are multiple dairies may cumulatively improve the quality of ground water.

Land and Shoreline Use
An unavoidable adverse impact may be the increased costs to owners/operators of commercial dairies due to increased inspections and regulatory compliance.

Public Services and Utilities
The impacts to Ecology and conservation districts associated with implementation of this alternative would be cumulative with impacts associated with those entities' other responsibilities and obligations.

6.32 Alternative WP 32: Request that Ecology expedite development and implementation of a TMDL for a basin or subbasin.

6.32.1 Impacts

Surface Water

Long-term/operational impacts

Development of a TMDL may result in more rapid improvement in water quality. The degree of improvement in water quality and the rate of change will vary locally, depending upon the measures specified in the local plan.

Ground Water

Long-term/operational impacts

Implementation of this alternative could reduce contaminant loading to ground water by reducing the average contaminant concentrations in surface waters that recharge ground water. The magnitude of this potential impact would depend on the degree to which such implementation would reduce contaminants in recharge water and on the extent to which surface water bodies recharge ground water in the particular basin or subbasin.

Wildlife

Long-term/operational impacts

Implementing a TMDL is likely to have the benefit of improving water quality for aquatic organisms.

Environmental Health

Long-term/operational impacts

No significant adverse long-term impacts to environmental health are predicted for this alternative. Potential beneficial impacts include the improvement of water quality, allowing water-contact recreational uses in some water bodies not currently supporting this use.

Land and Shoreline Use

Short-term impacts

As Ecology begins to implement TMDLs on a more expedited schedule both point sources and nonpoint sources of pollution may be affected. Short-term land-use impacts associated with this alternative may include costs to individual farm owners for modification and implementation of farm plans and to reduce or prevent nonpoint pollution and erosion. Expedited TMDL implementation may also impose requirements for improving the quality of discharges on existing industries. This could result in short-term capital cost impacts to affected industries.

Long-term/operational impacts

This alternative could result in an increase in operational costs associated with contaminant control for affected industries, municipalities, and agricultural facilities. However, this alternative would not affect the nature of contaminant control measures necessitated by the

TMDL. It would only affect the timing of implementation, decreasing the time until implementation was complete.

Public Services and Utilities

Short-term impact

Ecology would need to consider the priority assigned to the 303(d) listed body of water for which the request for the expedited TMDL applies. If the body of water is not a high priority, additional resources or assistance would need to be provided to Ecology for that department to undertake the requested action.

6.32.2 Mitigation Measures

Land and Shoreline Use

Mitigation measures for industrial dischargers are described in Section 6.30.2; and mitigation to abate costs for individual farmers is described in Section 6.31.2.

Public Services and Utilities

The implementation plan for a watershed plan should specify whether targeted funding can be provided to Ecology for the purpose of preparing a TMDL for the specific 303(d) listed body of water. If not, then the implementation plan should identify the form in which assistance could be provided to Ecology, for example:

- Providing Ecology with information that would elevate the priority of the specific 303(d) listed body of water when Ecology develops its next annual list; or

- Generating the data needed by Ecology for development of the TMDL for the specific 303(d) listed body of water.

6.32.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

More rapid TMDL implementation across the state would result in more rapid improvements in surface water quality.

Ground Water

More rapid TMDL implementation across the state would result in more rapid improvements in ground water quality.

Wildlife

More rapid TMDL implementation is likely to have the benefit of improving water quality for aquatic organisms more rapidly.

Public Services and Utilities

The impacts to Ecology associated with implementation of this alternative would be cumulative with impacts associated with the department's other responsibilities and obligations.

6.33 Alternative WP 33: Request conservation districts or irrigation districts to assist in achieving reductions in nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal specific 303(d) listed water bodies.

6.33.1 Impacts

Earth

Long-term/operational impacts

This alternative may have a positive impact on earth resources by reducing erosion associated with agricultural practices. This could occur if the modified plans include requirements that reduce runoff from agricultural land.

Surface Water

Long-term/operational impacts

No long-term impacts to surface water quantity are predicted from this alternative. Modification of management plans and implementation of water quality improvement projects will likely reduce inputs of sediment, nutrients, and other nonpoint pollutants associated with agricultural and grazing land use. Such actions may also result in increased shade along streams, with subsequent decreases in water temperature. The magnitude of these effects will vary depending on the nature of individual actions.

Ground Water

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1.

Plants

Long-term/operational impacts

Reductions in pollution loads may have a positive benefit on the health of aquatic plant communities and may improve diversity.

Wildlife

Long-term/operational impacts

Reductions in pollution loads may have a positive benefit on the health of aquatic organisms similar to those described in Section 6.31.1.

Land and Shoreline Use

Long-term/operational impacts

Costs borne by irrigation districts associated with achieving reductions in nonpoint source pollution and/or implementation of TMDLs could result in the need to increase assessments or fees for irrigation water, unless funding is provided from an outside source.

Public Services and Utilities

Short-term impacts

Conservation districts and irrigation districts may incur costs associated with revising the management plans and implementing water quality improvement projects. They may also incur costs in expanding their outreach programs that provide technical assistance to farmers.

6.33.2 Mitigation Measures

Land and Shoreline Use

Cost share funding administered by the Natural Resources Conservation Service and conservation districts could offset costs associated with planning and implementation of this alternative.

Public Services and Utilities

Mitigation measures for public services and utilities would be the same as that identified for land and shoreline use.

6.33.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

Where a number of water quality improvement projects are implemented in the same basin, the net reduction in pollutant loads will be cumulative.

Ground Water

Where a number of water quality improvement projects are implemented in the same basin, the net reduction in pollutant loads to the ground water will be cumulative.

Public Services and Utilities

The impacts to conservation and irrigation districts associated with implementation of this alternative would be cumulative with impacts associated with those entities' other responsibilities and obligations.

6.34 Alternative WP 34: Request conservation districts to modify individual farm plans as necessary to reduce or prevent nonpoint pollution and erosion.

6.34.1 Impacts

Earth

Long-term/operational impacts

This alternative may have a positive impact on earth resources by reducing erosion associated with agricultural practices. This could occur if the modified plans include requirements that reduce runoff from agricultural land.

Surface Water

Long-term/operational impacts

Modification of farm plans will likely have impacts similar to those described in Section 6.33.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.31.1.

Plants

Long-term/operational impacts

Reductions in pollutant loading may have a positive benefit on the health of aquatic plant communities.

Wildlife

Long-term/operational impacts

Reductions in pollutant and/or sediment loading from farms may have a positive benefit on the health and diversity of aquatic fauna.

Land and Shoreline Use

Short-term impacts

Short-term land-use impacts associated with this alternative may occur. Potential short-term impacts to individual farm owners that choose to participate include the cost of implementing modifications to farm plans to reduce or prevent nonpoint source pollution and erosion.

Long-term/operational impacts

Implementation of this alternative may result in long-term land use impacts in that it may require a long-term commitment of resources by affected farm owners that choose to participate.

Public Services and Utilities

Short-term impacts

Additional resources may be needed by conservation districts to implement the alternative, or such districts may need to extend implementation over a time period that is consistent with availability of resources.

6.34.2 Mitigation Measures

Land and Shoreline Use

Mitigation measures for this alternative are identified in Section 6.31.2.

Public Services and Utilities

Mitigation measures for this alternative are identified in Section 6.33.2.

6.34.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

In areas where several plans are modified in the same basin, the net reduction in pollutant loads will be cumulative.

Wildlife

In areas where several plans are modified in the same basin, the net reduction in pollutant loads will be cumulative. These will have a positive cumulative benefit to the aquatic life.

Public Services and Utilities

The impacts to conservation districts associated with implementation of this alternative would be cumulative with impacts associated with those entities' other responsibilities and obligations.

6.35 Alternative WP 35: Request local governments and state agencies to continue to implement or more fully implement existing water quality plans, including plans developed under Chapter 400-12 WAC.

6.35.1 <u>Impacts</u>

Surface Water

Long-term/operational impacts

Implementation of plans may protect, restore, or enhance water quality. The rate and magnitude of improvement will be dependent upon the requirements of individual plans.

Ground Water

Long-term/operational impacts

Implementation of this alternative could restore, protect, or enhance ground water quality by reducing contamination of ground water, soil, and/or surface water bodies that recharge ground water. The magnitude of this potential impact would depend on the current ground water quality, the degree to which existing water quality plans are implemented, the degree to which these plans would be better implemented under this alternative, and the effectiveness of these plans to reduce such contamination.

Plants

Long-term/operational impacts

Depending on the specific recommendations in each water quality plan, aquatic plant species and diversity may increase as water quality improves.

Wildlife

Long-term/operational impacts

Depending on the specific recommendations in each water quality plan, aquatic organism species and diversity may increase as water quality improves.

Land and Shoreline Use

Long-term/operational impacts

Increased implementation of existing water quality plans may result in long-term land use impacts, in that they may involve regulatory changes that could increase development costs and thereby affect land and shoreline use. For example, stricter enforcement of state water quality standards and the federal Clean Water Act for nonpoint pollutant sources, such as farms, may increase agricultural development costs and therefore affect the nature of development.

Recreation

Long-term/operational impacts

Positive benefits may be realized for water-related recreational activities if improvements in water quality are achieved.

Public Services and Utilities

Short-term impacts
Implementation of this alternative would likely result in the need for additional resources for state and local agencies to fund implementation activities.

Long-term/operational impact
Some implementation activities, for example development and implementation of water quality monitoring programs, may require a long-term commitment of state and local agency resources.

6.35.2 Mitigation Measures

Land and Shoreline Use
State and local government could provide technical assistance to landowners, developers, and realtors concerning implementation of this alternative.

Public Services and Utilities
The implementation plan for a watershed plan should identify possible sources of funding to support this alternative.

6.35.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Long-term cumulative implementation of water quality plans may result in improved water quality.

Ground Water
Long-term cumulative implementation of water quality plans may result in improvements in ground water quality.

Plants
Long-term cumulative implementation of water quality plans may result in improved water quality and secondary improvements in the health of wetland communities.

Wildlife
Long-term cumulative implementation of water quality plans may result in improved water quality that will improve habitat for fish and other aquatic species.

Land and Shoreline Use
Long-term cumulative implementation of water quality plans may affect land use activities. Implementation of plans with regulatory elements could contribute to increased costs of development.

Public Services and Utilities
The impacts to state and local agencies associated with implementation of this alternative would be cumulative with impacts associated with those agencies' other responsibilities and obligations.

6.36 Alternative WP 36: Develop and implement a water quality public education program intended to prevent or reduce nonpoint pollution with focus on pollution sources associated with an urban setting, or focus on pollution sources associated with a rural setting

6.36.1 Impacts

Surface Water

Long-term/operational impacts

Public education may persuade landowners to voluntarily implement water quality improvement activities. Such activities may include reducing fertilizer use, planting riparian areas, avoiding discharging pollutants into storm drains, or controlling sediment during major landscaping projects. Such actions may have a net benefit on surface water quality. The magnitude of effect will be dependent upon the success of the public education program and the degree of voluntary implementation.

Public education in rural areas may influence landowners to voluntarily test wells and septic systems, and implement measures to improve water quality as described. Such programs may also influence residents to modify the management of stock to reduce runoff of nutrients from pastures. The magnitude of effect will be dependent upon the success of the public education program and the degree of voluntary implementation. A successful program that addresses failing septic systems could have significant positive effects in some locations (e.g., eutrophic lakes).

Ground Water

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1. The magnitude of the potential impacts would depend on the degree to which such education programs lead to reduction in pollution.

Plants

Long-term/operational impacts

Public education may persuade landowners to voluntarily implement water quality improvement activities. Such activities may include planting of riparian areas, or reconstructing wetland areas. Over time these activities could improve the health and abundance of the native plant communities.

Wildlife

Long-term/operational impacts

Public education may persuade landowners to implement water quality improvement activities. Such activities may include reducing fertilizer use, planting riparian areas, avoiding discharging pollutants into storm drains, or controlling sediment during major landscaping projects. Such actions may have a net benefit on surface water quality, which would have a positive benefit on the health of the aquatic communities. In addition, planting of riparian areas, or reconstructing wetland areas could provide habitat for native wildlife species.

Scenic Resources and Aesthetics

Long-term/operational impacts
Public education may lead to improvements in water quality, which could improve the quality of scenic resources.

Recreation

Long-term/operational impacts
Public education may lead to improvements in water quality, which could secondarily improve the quality of water-related recreational experiences.

Public Services and Utilities

Short-term impacts
If the sponsoring party is a state or local agency, such an agency would need to possess or obtain sufficient resources for development, production, and distribution of the educational materials.

6.36.2 Mitigation Measures

Public Services and Utilities
Mitigation measures are the same as those identified in Section 6.35.2.

6.36.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
The cumulative effects of public education programs in reducing adverse water quality impacts will be dependent upon the success of various education programs.

Ground Water
The cumulative effects of public education programs in reducing adverse water quality impacts will be dependent upon the success of various education programs.

Plants
The cumulative effects of public education programs in reducing adverse water quality impacts, and secondarily improving the health of plant communities, will be dependent upon the success of various education programs.

Wildlife
The cumulative effects of public education programs in reducing adverse water quality impacts and improving the health of aquatic habitat will be dependent upon the success of various education programs.

Scenic Resources and Aesthetics
The cumulative effects of public education programs in reducing adverse water quality impacts, and secondarily improving scenic resources will be dependent upon the success of various education programs.

Recreation
The cumulative effects of public education programs in reducing adverse water quality impacts, and secondarily improving recreational opportunities will be dependent upon the success of various education programs.

Public Services and Utilities
Cumulative impacts would be the same as those described in Section 6.35.3.

6.37 Alternative WP 37: Request local governments and Ecology to develop and operate water quality monitoring programs, including installation and maintenance of monitoring devices, to measure the extent of nonpoint pollution and/or measure the effectiveness of nonpoint pollution control measures.

6.37.1 Impacts

Earth

Short-term impacts

Minor short-term impacts to earth resources associated with this alternative could occur from installation of monitoring devices. These temporary construction-related impacts to earth resources would be the as those discussed in Section 6.1.1.

Surface Water

Short-term impacts

The short-term impacts to surface water resources are similar to those described in Section 6.18.1.

Long-term/operational impacts

Monitoring of water quality may influence the effectiveness of water quality management programs and have a net effect of reducing the effects of land management practices on water quality.

Ground Water

Long-term/operational impacts

Implementation of this alternative may improve the effectiveness of ground water quality management programs and efforts by providing data with which to make management decisions. This could lead to an improvement in ground water quality through reduction in contaminant levels in recharge.

Plants

Short-term impacts

Installation of monitoring devices may result in minor short-term construction-type impacts on plant communities similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

Installation of monitoring devices may result in minor short-term construction-type impacts on aquatic organisms similar to those described in Section 6.2.1.

Long-term impacts

Installation of monitoring devices may result in improved water quality management and secondarily to improved fish and wildlife habitat.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts to scenic resources and aesthetics are anticipated to be similar to those described in Section 6.18.1.

Land and Shoreline Use

Short-term impacts

Installation and maintenance of water quality monitoring devices may require compliance with local shoreline mater programs.

Public Services and Utilities

Short-term impacts

Implementation of this alternative would likely result in the need for additional resources for state and local agencies.

Long-term/operational impacts

Long-term impacts would be similar to those described in Section 6.35.1.

6.37.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Surface Water

To protect water quality for the short-term construction-related impacts, mitigation measures similar to those described in Section 6.18.2 should be implemented.

Plants

Mitigation measures for impacts to plant communities are described in Section 6.2.2.

Wildlife

Mitigation measures for impacts to fish, aquatic resources and wildlife are described in Section 6.2.2.

Public Services and Utilities

Mitigation measures are the same as those identified in Section 6.35.2.

6.37.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water

Improvements in understanding water may result in better water quality management, which may, subsequently, trigger any of the other alternatives.

Ground Water

Improvements in understanding water may result in better water quality management, which may, subsequently, trigger any of the other alternatives.

Wildlife
Improvements in understanding water may result in better water quality management, which could, secondarily, improve aquatic habitat for fish and other aquatic organisms.

Public Services and Utilities
Cumulative impacts would be the same as those described in Section 6.35.3.

6.38 Alternative WP 38: Request local governments to modify Growth Management Act comprehensive plans and other land use plans to help achieve reductions in nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303(d) listed water bodies.

6.38.1 Impacts

Surface Water

Long-term/operational impacts

Long-term impacts of the alternative on water quality are similar to those described in Section 6.35.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1.

Plants

Long-term/operational impacts

Depending on the specific implementation of actions as a result of modified plans to reduce or control pollution, riparian and aquatic plant communities may benefit from improved water quality.

Wildlife

Long-term/operational impacts

Depending on the specific implementation of actions as a result of modified plans to reduce or control pollution, aquatic organisms may benefit from improved water quality.

Land and Shoreline Use

Long-term/operational impacts

Modification of land use plans to achieve reductions in nonpoint pollution may result in long-term impacts to land and shoreline use by increasing development costs for compliance with the plans. The alternative could potentially affect the density of new development, the spatial distribution of development, and/or the character of development.

Public Services and Utilities

Short-term impacts

Modification of plans would likely require additional funding for participating local governments and potentially for state agencies that must review modified plans for consistency with state statutes.

6.38.2 Mitigation Measures

Land and Shoreline Use
Local governments could provide technical assistance to those affected by amendments to comprehensive plans and other land use plans to provide information on cost-effective compliance techniques.

Public Services and Utilities
Mitigation measures are the same as those identified in Section 6.35.2.

6.38.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality.

Ground Water
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality, assuming pollutant loading is not transferred from surface water to ground water.

Plants
Reductions in nonpoint source pollution across the state could have the cumulative impact of improving water quality, which may secondarily improve riparian habitat and native plant communities.

Wildlife
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality, which would improve the health of the aquatic habitat for fish and other aquatic species.

Land and Shoreline Use
The impacts of modifications to Growth Management Act comprehensive plans and other land use plans may be cumulative with the impacts of regulatory actions intended to achieve the same objectives and could result in greater restrictions on land use.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 6.35.3.

6.39 Alternative WP 39: Request local governments to amend shoreline master programs to help achieve reductions in nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303(d) listed water bodies.

6.39.1 Impacts

Surface Water

Long-term/operational impacts

Long-term impacts of this alternative on water quality are similar to those described in Section 6.35.1.

Ground Water

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1.

Plants

Long-term/operational impacts

Depending on the specific implementation of shoreline master program actions to reduce or control pollution, wetland and/or aquatic plants may benefit from improved water quality.

Wildlife

Long-term/operational impacts

Depending on the specific implementation of shoreline master program actions to reduce or control pollution, fish and other aquatic organisms may benefit from improved water quality.

Land and Shoreline Use

Long-term/operational impacts

Amending shoreline master programs may result in long-term impacts on shoreline use by creating more restrictive development standards in shoreline areas. Use of private property in shoreline areas may be limited to a greater degree than under existing master programs.

Public Services and Utilities

Short-term impacts

Short-term impacts are the same as those described in Section 6.38.1.

6.39.2 Mitigation Measures

Land and Shoreline Use

Local governments could provide technical assistance to those affected by amendments to shoreline master programs to provide information on cost-effective compliance techniques.

Public Services and Utilities

Mitigation measures are the same as those identified in Section 6.35.2.

6.39.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality.

Ground Water
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality, assuming pollutant loading is not transferred from surface water to ground water.

Plants
Reductions in nonpoint source pollution across the state could have the cumulative impact of improving water quality, which may secondarily improve riparian habitat and native plant communities.

Wildlife
Reductions in nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality, which would improve the health of the aquatic habitat for fish and other aquatic species.

Land and Shoreline Use
Modifications to shoreline master programs may result in unavoidable increased compliance costs and may alter allowable land and water use activities in shoreline areas.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 6.35.3.

6.40 Alternative WP 40: Request local governments to modify local regulations such as critical areas ordinances, stormwater regulations, and on-site sewage regulations to help achieve reductions in or prevent nonpoint pollution and/or to implement Total Maximum Daily Loads established for federal 303(d) listed water bodies.

6.40.1 Impacts

Surface Water

Long-term/operational impacts

Long-term impacts of this alternative on water resources are similar to those described in Section 6.35.1.

Ground Water

Short-term impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1.

Long-term/operational impacts

Implementation of this alternative would involve the same potential impacts as discussed in Section 6.32.1.

Plants

Long-term/operational impacts

Depending on the specific implementation of ordinances and regulations to reduce or control pollution, riparian and aquatic plant communities may benefit from improved water quality.

Wildlife

Long-term/operational impacts

Depending on the specific implementation of ordinances and regulations to reduce or control pollution, aquatic organisms and other wildlife may benefit from improved water quality.

Land and Shoreline Use

Long-term/operational impacts

Modification of local regulations (for example, critical areas ordinances, stormwater regulations, on-site sewage regulations) may result in long-term impacts to land and shoreline use if such modifications result in more restrictive standards for new development and re-development. Compliance costs associated with such standards may increase development costs and raise the cost of property and housing.

Public Services and Utilities

Short-term/operational impacts

Modification of local regulations would likely require additional resources for affected local agencies and legislative authorities.

6.40.2 Mitigation Measures

Land and Shoreline Use
State and local agencies could provide technical assistance to help affected parties comply with modified regulations in a cost-effective manner.

Public Services and Utilities
Mitigation measures for this alternative are the same as those described in Section 6.35.2.

6.40.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Implementation of modifications to local ordinances that reduce nonpoint pollution on a broad scale across the state could have the cumulative impact of improving water quality.

Ground Water
Implementation of modifications to local ordinances that reduce nonpoint pollution on a broad scale across the state could have the cumulative impact of improving water quality, assuming pollutant loading is not transferred from surface water to ground water.

Plants
Implementation of modifications to local ordinances that reduce nonpoint source pollution across the state could have the cumulative impact of improving water quality, which may secondarily improve riparian habitat and native plant communities.

Wildlife
Implementation of modifications to local ordinances that reduce nonpoint source pollution on a broad scale across the state could have the cumulative impact of improving water quality, which would improve the health of the aquatic habitat for fish and other aquatic species.

Public Services and Utilities
The impacts to local agencies associated with implementation of this alternative would be cumulative with impacts associated with those agencies' other responsibilities and obligations.

6.41 Alternative WP 41: Take no action regarding water quality

6.41.1 Impacts

Surface Water

Short-term impacts

Short-term impacts of this alternative on surface water quality are similar to the long-term impacts, but are incrementally smaller, reflecting the shorter duration of time.

Long-term/operational impacts

Taking no action to address water quality may, in some watersheds, lead to continued degradation of the water quality. It may also violate the federal Clean Water Act and Safe Drinking Water Act as well as the State's Water Pollution Control Act and other statutes and regulations. The magnitude of effect will be dependent upon the impacts that existing local, state, and federal rules and regulations and voluntary local actions have on reducing water quality effects of land use.

Ground Water

Long-term/operational impacts

Taking no action to address water quality may, in some watersheds, lead to continued degradation of the ground water quality. In addition, taking no action to protect or restore water quality may violate the federal Safe Drinking Water Act as well as the state's Water Pollution Control Act and associated regulations.

Plants

Taking no action may result in altered species composition and/or function in those riparian habitats where substantial amounts of water continue to be degraded from current practices.

Wildlife

Long-term/operational impacts

Taking no action to protect or improve water quality may result in degradation to fish and wildlife habitat through continued pollution of the water, and may, ultimately, exacerbate conditions for those aquatic species listed under endangered species legislation.

Scenic Resources and Aesthetics

Long-term/operational impacts

Lake eutrophication may adversely impact scenic resources and aesthetics. Over time, algal blooms may become a problem causing discoloration and fouling of the lake or water body. Depending on the extent of the bloom, odors may be produced from the eutrophication.

Environmental Health

Long-term/operational impacts

Failure to protect or restore water quality may pose public health risks associated with contaminants in drinking water and in bodies of water that are subject to any form of human contact, including water recreation (boating, swimming, water skiing), fishing, and irrigation of crops. Contaminants in surface water may be transported to other media, including sediment, ground water, food crops, and fish and shellfish, which could result in additional human exposure to pathogens or other contaminants.

Land and Shoreline Use

Long-term/operational impacts

Failure to protect or restore water quality may lead to deterioration or property values. For example, water front property adjacent to water bodies undergoing eutrophication from the input of excess nutrients may be devalued.

Cultural Resources

Long-term/operational impacts

Failure to protect or restore water quality may adversely affect bodies of water with cultural or traditional significance by depleting fish habitat and impacting traditional use.

Recreation

Long-term/operational impacts

Taking no-action to protect or restore water quality could lessen the quality of the recreational experience. Existing swimming and bathing waters that become contaminated with fecal coliform may be closed to those recreational uses. In water bodies that are effected by high levels of nutrients causing excessive algal growth, swimming would be unpleasant for most people. Excess aquatic plant growth may foul beaches or may pose a danger to younger swimmers. Decaying algae or aquatic macrophytes may cause unpleasant odors. In addition, eutrophication may decrease the fish habitat thereby reducing the quality of the recreational fishing experience.

Public Services and Utilities

Long-term/operational impacts

The no action alternative may increase agency costs associated with protection of water quality. By not undertaking community based programs to prevent degradation of water quality, agencies would need to place greater focus on relatively expensive enforcement actions to protect water quality.

6.41.2 Mitigation Measures

The "No Action" alternative assumes that water quality would continue to be managed through the existing framework of federal, state, local, and tribal programs, and water user practices. In some watershed areas, existing systems may be adequate to provide for all water needs. In other watersheds, significant impacts may be experienced or continue to be experienced without implementation of additional mitigation measures.

6.41.3 <u>Cumulative Impacts and Significant Unavoidable Adverse Impacts</u>

Surface Water

The cumulative impacts of taking no action to address water quality on a statewide basis could involve regional degradation of surface water quality. The magnitude of degradation in water quality will be dependent upon numerous factors affecting growth, water use, and the level of implementation of point and nonpoint source controls.

Ground Water

The cumulative impacts of taking no action to address water quality on a statewide basis could involve the regional degradation of ground water quality.

Plants

No action to protect or improve water quality may result in degradation of aquatic and riparian plant community composition and diversity. The existing and/or continued pollution may further threaten the health of plant species listed under endangered species legislation.

Wildlife

No action to protect or improve water quality may result in degradation of aquatic and wildlife species composition and diversity from water pollution in the watersheds. The existing and/or continued pollution may further threaten the health of species listed under endangered species legislation.

Scenic Resources and Aesthetics

Without action to protect and restore water quality, eutrophication could occur in a number of lakes around the state. It is unlikely that it would create cumulative visual impacts; however, the quality of the visual landscape would have to be reviewed on an individual viewscape basis.

Environmental Health

Potentially significant cumulative impacts could be associated with this alternative. Washington’s 1998 303(d) list indicated 643 impaired water body segments within the state, which represents about two percent of all waters in Washington. Bacteria violations account for 285 listings, while 78 water bodies suffer from elevated toxics. Under this alternative, the number of impacted water bodies and the degree of impact could increase. This increase would have a significant potential cumulative impact to public health.

Land and Shoreline Use

No action to protect and restore water quality may lead to a decrease in property values for properties located adjacent to water bodies with degraded water quality.

Cultural Resources

Significant and unavoidable adverse impacts to cultural resources may result from failure to protect or restore water quality in multiple bodies of water through time, depleting fish habitat and impacting traditional use.

Recreation

Without action to protect and restore water quality, eutrophication could occur in a number of lakes around the state. This could decrease the quality of the fishing and other recreational experiences.

6.42 Alternative WP 42: Implement habitat improvement projects involving construction or placement of instream structures, such as cross vanes, vortex weirs, large woody debris, fish screens, and side-channels.

6.42.1 Impacts

Earth

Short-term impacts
Short-term impacts to earth resources associated with this alternative could occur in the vicinity of stream banks from construction and placement of instream structures. These temporary construction-related impacts to earth resources would be the as those discussed in Section 6.1.1.

Air

Short-term impacts
Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts
Impacts of construction activities on surface water resources are likely to be similar to those described in Section 6.1.1.

Long-term/operational impacts
Habitat improvements may induce or allow for channel migration. As a result, sediment may be mobilized and carried to downstream reaches. This may result in small increases in turbidity until such time as channel morphology processes stabilize.

Plants

Short-term impacts
The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts
Depending on the specific habitat improvement project implemented, plant communities are likely to benefit through increased native plant presence and diversity.

Wildlife

Short-term impacts
The short-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Habitat improvement projects have the potential to significantly improve fish habitat through placement of wood and other structures that collect spawning gravel and enhance the formation of pools. Monitoring of the effectiveness of such projects has been limited. The documented effectiveness of habitat improvement projects has been highly variable. Although only limited formal monitoring has occurred, it appears that many projects that have been undertaken in the past have not had any positive effect. A few may actually have been harmful to fish populations. The ones that have the greatest positive effect are carefully located, planned, and based on landscape scale processes (fluvial geomorphology, soil-water interactions, and vegetation-water-soil interactions). In some areas, endangered species have moved into streams where they had previously been extirpated. Hence, carefully planned projects can have large positive impacts.

Energy and Natural Resources

Short-term impacts

The short-term impacts are similar to those described in Section 6.19.1, but on a much smaller scale.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from habitat improvement projects would be similar to those described in Section 6.5.1. In addition, scenic and aesthetic resources may be affected temporarily by the increase in sediments in the water. Turbidity in rivers and stream will cause discoloration, thereby creating a visual impact. Once construction has stopped, however, the turbidity would also subside.

Long-term/operational impacts

In areas where the habitat is degraded, an instream improvement project may restore scenic resources and aesthetics by creating healthy riparian and fish habitat.

Environmental Health

Short-term impacts

Temporary construction-related health and safety impacts to workers could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts

Implementation of this alternative would result in short-term impacts to land and shoreline use. Development must be consistent with applicable critical area ordinances and shoreline master programs. In addition, projects may require access to water bodies through private property.

Long-term/operational impacts

In some cases, projects that enhance habitat may cause channels to migrate to new locations in shoreline areas, resulting in damage to property and structures.

Cultural Resources

Short-term impacts
Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts
Long-term adverse impacts to archaeological resources from habitat improvement projects may include erosion and inundation of resources due to changes in the flow regimes caused by instream structures, changing flow regimes, water levels, or channel migration patterns may adversely affect archaeological resources by eroding the site. This can result in loss of context of artifacts and features, as well as artifact abrasion. At the same time, habitat improvement projects may result in beneficial effects to traditional use of significant waterways by improving fish habitat.

Recreation

Short-term impacts
Short-term impacts from this alternative would be similar to those described in Section 6.20.1.

Long-term/operational impacts
Not taking action to address water quality may, in some watersheds, lead to continued degradation of the ground water quality. Recreation opportunities could change as a result of habitat improvement projects. Recreation activities such as boating, canoeing, kayaking, and swimming may be obstructed. However, other recreation opportunities may be created or enhanced, such as fishing.

Transportation

Short-term impacts
Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Long-term/operational impacts
Habitat improvement projects may sometimes result in the placed large woody debris breaking loose and floating downstream. If this debris blocks culverts, secondary impacts including water overtopping roadways or even erosion of road sections may result. Large woody debris that breaks loose may also cause damage to bridge piers.

Public Services and Utilities

Short-term impacts
This alternative may require significant resources for project design, state and local permitting, project construction, and/or construction monitoring. Projects that qualify as fish habitat enhancement projects under Chapter 70.55 RCW would be eligible to be reviewed under the Department of Fish and Wildlife's streamlined Hydraulic Project Approval process and would be exempt from local permitting processes.

Long-term/operational impacts

This alternative may require significant resources for long-term monitoring of project effectiveness by local, state, and tribal entities.

6.42.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

The impacts of this alternative on water resources are predominantly positive; however mitigation measures for short-term impacts are described in Section 6.1.2.

Plants

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife. Extreme care should be taken in planning and implementing these habitat improvement programs to ensure that fish habitat will actually be improved and the project improvements will remain in place. Planning should include consideration of expected long-term effects on channel morphology, stream adjacent soil moisture, and subsequent effects on riparian vegetation.

Energy and Natural Resources

Mitigation measures are described in Section 6.19.2.

Scenic Resources and Aesthetics

Revegetating the disturbed shoreline areas after construction could diminish the impact to scenic resources and aesthetics.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2.

Land and Shoreline Use

Measures to mitigate impacts to land and shoreline use from this alternative include providing advance notification to property owners likely to be affected, obtaining property access through easements or obtaining permission for ingress and egress. Construction should also be scheduled for those periods that would cause the least disturbance to nearby landowners.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2. Mitigation measures for long-term operational impacts may include measures identified for short-term impacts, as well as site stabilization measures.

Recreation
Mitigation measures would be the same as those described in Section 6.20.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2. Long-term impacts from escaping large woody debris may be reduced by ensuring that the debris is properly engineered and placed to withstand the forces of floodwaters and to counteract the buoyant forces of the wood.

Public Services and Utilities
The implementation plan prepared for a watershed plan should identify potential sources of funding to offset costs that may be incurred by state and local agencies.

6.42.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.2.

Wildlife
Implementing this alternative in combination with other habitat improvement efforts is likely to have positive impacts on the aquatic communities and improve habitat for endangered and other native species.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Land and Shoreline Use
Implementation of this alternative statewide may result in some loss of waterfront properties due to channel migration. In addition, as streams revert to more natural flow regimes, there may be a general increase in the level of flooding of property. However, because flooding could be predicted prior to implementation of the action, properties could be acquired or conservation easements negotiated, thereby reducing the impacts.

Cultural Resources
Cumulative impacts would be similar to those identified in Section 6.1.3. Significant unavoidable adverse impacts to archaeological resources may result from erosion and inundation of resources.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Transportation
If instream habitat improvement projects are not properly designed and constructed, roads and bridges could be damaged from dislodged debris during large flood events.

Public Services and Utilities
The impacts to state and local agencies associated with implementation of this alternative would be cumulative with impacts associated with those agencies other responsibilities and obligations.

6.43 Alternative WP 43: Implement habitat improvement projects intended to "daylight" streams that are currently contained within enclosed channels.

6.43.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (e.g., removal of drainage lines, stream reconstruction, etc.). These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts of this alternative on surface water resources are associated with construction impacts. Daylighting streams may result in significant short-term increases in sediment loads and turbidity. Upon exposure, water temperatures will likely increase. The increase in water temperature will be affected by the amount of vegetation present along the stream. In the short term, stream temperature will likely be greater than natural background temperatures due to a lack of vegetation. Stream temperature may or may not exceed water quality standards. The potential for exceeding those standards is primarily dependent upon local ambient air temperature, the depth of the stream, the amount of ground water inflow into the affected portion of the stream. If the project includes restoration of streamside vegetation, temperatures may decrease over time, depending on the type and size of vegetation planted along the stream and the size of the stream itself.

Long-term/operational impacts

The long-term impacts of daylighting streams on stream temperature will depend on the type of vegetation that is established along a stream. Stream temperature is affected by the amount of shade provided. In the absence of riparian vegetation that provides shade, stream temperatures will exceed the natural background temperature of the stream, and may or may not exceed water quality standards. Where riparian vegetation adequately shades the stream, stream temperatures will gradually be reduced. In the long-term, stream temperature may meet the natural background temperature if shade levels are sufficient. Water quality standards may be met with less shade. The duration of impact to stream temperature will be dependent upon the size of the stream and the types of vegetation that are established alongside the stream. Most of the streams that are daylighted will tend to be very small streams. Very small streams can be shaded with relatively short vegetation, which may develop in a matter of a few years. Larger streams require taller vegetation (trees), which may take decades to mature.

Daylighted streams may also be exposed to inputs of pollutants from land use. The amount of pollutants introduced will vary with the type of adjacent land use. For instance, fertilization of lawns, golf courses, and/or fields adjacent to the stream may introduce nutrient loads to the stream. Sediment runoff from fields, construction sites, roads, or other sediment sources could potentially increase stream turbidity and substrate sediment loads. Other pollutants may also find their way into the stream from livestock, pets, and recreational use. The presence of streamside vegetation may help reduce the quantity of these inputs. Additionally, many of these streams currently act as stormwater drains. If stormwater is diverted from the stream during the daylighting process, water quality may be improved. Over time, the stream will rework the newly created channel as it settles into a more natural morphology. This reworking of the channel bottom and banks may result in sediment transport to downstream reaches. The amount of sediment that is transported will depend upon the stream flow, gradient, and type of material in the bed and banks of the channel. In time, this process will stabilize.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

The short-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Where daylighted portions of streams are in direct connection with fish bearing waters, daylighting of streams has the potential to increase habitat available to those fish populations and in the long run increase fish productivity. The magnitude of effect will depend on the quality of habitat that is developed through planning or natural processes in the treated reach.
Where daylighting portions of streams connects downstream fish populations to unused upstream habitat, daylighting may allow downstream populations to become re-established in upstream habitats.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from habitat improvement projects would be similar to those described in Section 6.42.1.

Long-term/operational impacts

In areas where the habitat is degraded, then habitat improvement projects may restore scenic resources and aesthetics by creating a continuous river or stream view.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts to land and shoreline use associated with this alternative are discussed in Section 6.42.1.

Long-term/operational impacts

Habitat improvement projects intended to "daylight" streams currently in enclosed, confined channels may cause channels to migrate to new locations in shoreline areas, causing damage to property and structures. On the other hand, implementation of this alternative may enhance the value of the adjacent property, particularly after the riparian habitat is restored.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Recreation

Long-term/operational impacts

New recreation opportunities such as fishing may develop from upgrading stream habitat.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1

6.43.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Construction impacts may be significant, but will be short-term in nature. Mitigation measures include minimizing the area disturbed, diverting flow during the period that the channel is reconstructed, vegetating the newly formed banks quickly to reduce surface erosion and initiate the growth of shade plants along the stream, and providing roughness (e.g., rocks and woody debris) in the channel to prevent or avoid downcutting of the new channel. Other mitigation approaches may also be applicable. Implementation of this alternative should be carefully planned and mitigation measures appropriate to the local situation should be identified.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Scenic Resources and Aesthetics
Landscaping the disturbed area with native vegetation after construction could diminish the impact to scenic resources and aesthetics.

Land and Shoreline Use
Mitigation measures to reduce the impacts of increased channel migration are similar to those described in Section 6.42.2.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.43.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
There are no expected significant cumulative impacts or unavoidable adverse impacts to surface water quality from this alternative. Plant litter inputs from adjacent riparian areas may improve downstream aquatic resources by providing a nutrient base to support aquatic production.

Plants
A positive cumulative increase in the numbers and diversity of riparian vegetation and habitat would result from "daylighting" streams.

Wildlife
The impacts of daylighting streams are anticipated to be positive in localized areas. Daylighting multiple stream segments may also have a cumulative benefit to invertebrates and fish by providing a more natural habitat. The increase in riparian vegetation and habitat that would result from "daylighting" streams may also increase wildlife use.

Scenic Resources and Aesthetics
Daylighting streams across the state may benefit the landscape if the streams were located in areas with high visual quality. In areas of low visual quality, the area may also benefit by creating a water feature. However, daylighting may also remove vegetation, therefore landscaping the disturbed area with native species is recommended.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Daylighting streams across the state may beneficially impact recreation by creating fishing and swimming opportunities.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.44 Alternative WP 44: Request local governments to route treated stormwater to water limited streams to allow for channel maintenance.

6.44.1 <u>Impacts</u>

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction activities to reroute stormwater. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts of construction are expected to be similar to those described in Section 6.1.1.

Long-term/operational impacts

Routing treated stormwater to water limited streams would change the hydrologic regime of the receiving water body. The degree of change would depend on the timing and quantity of stormwater routed to the stream. Changes in the timing of flows or the shape of the hydrograph could result in channel and/or bank scouring downstream and therefore have consequences for fish and wildlife. If the stormwater discharged into the stream is of lower quality than the receiving stream, water quality may be degraded. The alternative assumes that diverted water is treated. If the treated water meets or exceeds water quality standards, the decrease in water quality would not be significant. If, on the other hand, treatment only removed some pollutants, the introduction of the remaining pollutants could have significant affects on water quality. In either case, treated water discharged to streams may be a different temperature than the water in the stream. The impacts would be dependent upon the volume of water discharged relative to the current volume of water in the stream and on the difference in water temperature between the stream and the discharged waters. Generally, only localized impacts are expected, as water temperature tends to acclimate quickly to the surrounding conditions.

Ground Water

Long-term/operational impacts

Implementation of this alternative could affect ground water levels by changing the quantity and distribution of recharge. For example, recharge could be enhanced in cases where the addition of treated stormwater leads to an increase in average stage of losing reaches of a stream.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The addition of treated stormwater to existing water-limited streams would alter the hydrology and likely increase the existing riparian vegetation and habitat.

Wildlife

Short-term impacts

The short-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Increased flows in streams may benefit fish. The magnitude of improvement will be dependent upon the current flow situation in the receiving stream. Where flows in the receiving stream are limiting fish production, significant improvements in fish populations can be expected. If, however, flows are significantly increased, there may be long-term effects on channel morphology and the quality of habitat. For example, changes in the timing of flows or the shape of the hydrograph could also result in channel and/or bank scouring downstream and therefore have consequences for fish and wildlife. Project review should carefully evaluate the potential effects of modification of the hydrograph on channel morphology and fish habitat.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts to land and shoreline use associated with this alternative are similar to those described in Section 6.42.1.

Long-term/operational impacts

Potential long-term impacts to land and shoreline use associated with this alternative are similar to those described in Section 6.43.1.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1 In addition, implementation of this alternative would require a commitment by a local agency or entity to maintenance of any required treatment facilities.

6.44.2 <u>Mitigation Measures</u>

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air
Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Controls placed on the quality of water discharged to streams can effectively mitigate potential effects. Effects could be avoided if discharged water was required to meet or exceed state water quality standards.

Plants
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to plant communities.

Wildlife
Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to minimize adverse impacts to fish and wildlife.

Scenic Resources and Aesthetics
Where construction is involved, the mitigation measures described in Section 6.1.2 should be implemented.

Land and Shoreline Use
One measure to mitigate impacts to land and shoreline use from this alternative is to provide advance notification to property owners likely to be affected by additional flow volumes in streams. Project proponents should work with property owners to design an operation model that will minimize the potential for flooding of property during storm events.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.44.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
If numerous projects are completed under this alternative within the same basin, the potential effects on surface water quality will be cumulative and significantly adverse if mitigative measures are not taken. The long-term impacts from implementing this alternative on a broad scale are anticipated to be positive improvements to water quality associated with stormwater contaminant controls and treatment.

Plants
The routing of treated stormwater to water-limited streams will result in a positive cumulative increase in riparian vegetation and habitat.

Wildlife
Increases in riparian vegetation and habitat in water-limited streams may result in positive cumulative impacts to wildlife and fish, if this alternative is implemented throughout a watershed. It will likely result in an increase in wildlife population and use of riparian areas. The additional water may also increase fish habitat and use, depending on the volume of stormwater routed to the streams.

Scenic Resources and Aesthetics
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.45 Alternative WP 45: Request the Washington Department of Transportation, local governments, or other applicable agencies to remove or replace bridges, culverts, roadways, and other infrastructure as necessary to eliminate or reduce their impacts as fish passage obstructions and/or channel constrictions.

6.45.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts to water quality will be similar to those described in Section 6.1.1.

Long-term/operational impacts

Restoring proper flood plain function will allow the river to regain its natural ability to attenuate flood water by going overbank. Reactivation of side channels and allowing room for channel migration will also provide flood attenuation. Removal of constrictions to flow will also allow natural attenuation and will reduce the chances for devastating structure failures and avulsions.

Ground Water

Short-term impacts

Short-term construction-related impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

Short-term impacts to fish and wildlife are anticipated to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Improved fish passage may result in greater access to spawning and migration areas for survival and greater geographic distribution of fish species. The magnitude of the impact will depend on the quantity of habitat available upstream of the facility. Where little habitat is created or recreated, the positive effects on fish production will be negligible. There are, however, many situations where extensive habitat becomes available upstream of a blocking culvert. In these cases, significant positive effects from modification of facilities may result.

There is a possibility of introducing exotic fish species or disease to upstream populations. For instance, passage improvement projects have resulted in the introduction of brook trout into bull trout habitat. Brook trout have been documented to out-compete and eliminate bull trout populations, which are listed under the Endangered Species Act.

Energy and Natural Resources

Short-term impacts

Construction of new, improved culverts, bridges, or roadways may require short-term ground water control actions during the construction period. The ground water control equipment will consume electricity or gasoline/diesel resources. Additional short-term impacts are similar to those described in Section 6.19.1.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from infrastructure replacement would be similar to those described in Section 6.42.1.

Long-term/operational impacts

This alternative could change the viewshed of the area. Bridges and roadways add human attributes to a natural environment. However, some structures, particularly bridges add interest to the visual landscape. If a road or bridge were replaced, impact would be minimal as these structures are an expected part of the visual environment. However, a road or bridge built in a pristine area would contrast with the surrounding natural area and could cause an adverse impact.

Environmental Health

Short-term impacts

Temporary construction-related health impacts to workers could occur if construction activities are conducted as part of the implementation of this alternative. Construction-related impacts are discussed in Sections 6.1.1 (for major construction efforts) and 6.2.1 (for minor construction efforts).

Land and Shoreline Use

Short-term impacts

Short-term impacts to land and shoreline use associated with this alternative are similar to those described in Section 6.42.1 above, except that replacing bridges, culverts, roadways, or other infrastructure may require extensive property acquisition and/or access through private property.

Long-term/operational impacts

In the long-term, implementation of this alternative may require new or modified property access in affected areas, permanent realignment of roadways and new access routes for properties served by impacted roadways.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1. Removing historic bridges, roads, and other engineering features (demolition) may be considered an adverse effect to historic properties.

Recreation

Short-term impacts

Short-term impacts from infrastructure replacement would be similar to those described in Section 6.20.1.

Long-term/operational impacts

Long-term impacts from infrastructure replacement may result in improved fisheries, or in-water recreational experiences, such as kayaking.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Long-term/operational impacts

Implementation of this alternative would result in long-term impacts on transportation systems by requiring new alignments of roads and alteration of traffic patterns. This would require amendments to transportation plans and capital facility plans. Costs associated with implementation of this alternative would likely foreclose on options for other transportation improvement projects.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1

6.45.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air
Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water
Mitigation of short-term impacts described in Section 6.1.2 is applicable to this alternative.

Ground Water
Mitigation measures for temporary construction-related impacts to ground water associated with this alternative are the same as those discussed in Section 6.19.2.

Plants
Mitigation measures for the short-term impacts to plant communities are described in Section 6.2.2.

Wildlife
Mitigation measures for the short-term impacts to fish and wildlife are described in Section 6.2.2.

In addition, care should be taken to ensure that the project will not result in the introduction of non-native species into native species' habitat, especially where species are known to interact negatively. Care should also be taken to ensure that exotic diseases introduced through hatcheries are not carried into upstream habitats.

Energy and Natural Resources
Use of sheet piles to control ground water intrusion or other methods that require minimal energy will reduce the pumping requirements.

Scenic Resources and Aesthetics
Mitigation measures for impacts to scenic resources and aesthetics are discussed in Section 6.42.2.

Environmental Health
Potential mitigation measures to reduce noise impacts to area residents and minimize impacts to workers associated with hazardous substances are identified in Section 6.1.2.

Land and Shoreline Use
Project proponents should work with local community groups and property owners in designing projects, identifying new bridge and road alignments, and planning for new access points.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2.

Recreation
Mitigation measures for impacts to recreation are discussed in Section 6.20.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2. To reduce capital cost of implementing this alternative, Washington Department of Transportation should prioritize improvement projects based on their environmental cost-effectiveness.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2. In addition, it should be noted that the Washington Department of Transportation, in cooperation with the Washington Department of Fish and Wildlife, has an ongoing program dedicated to the removal of fish barriers associated with state highway infrastructure.

6.45.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Restoring proper flood plain function across the state will allow rivers to regain their natural ability to attenuate flood water by going overbank. Reactivation of side channels and allowing room for channel migration will also provide flood attenuation. Removal of constrictions to flow will also allow natural attenuation and will reduce the chances for devastating structural failures.

Plants
Implementation of this alternative is likely to have positive cumulative impacts if implemented in broad regions across the state. Riparian habitat and flood plain function are anticipated to be enhanced.

Wildlife
In many cases, cities and counties control bridges, culverts, and roadways low in the watershed. Where blockages to upstream fish passage occur at lower elevations within a watershed, fish may be excluded from large areas of habitat. Improvements in fish passage could therefore open large areas of habitat to fish. In cases where non-native populations are present downstream of passage blockage, non-native species could be introduced into upstream habitats. Introduction of non-native species into native populations, such as the introduction of brook trout or bull trout populations, can have devastating effects on the native populations. Implementation of this alternative in combination with other stream improvement projects is likely to have positive cumulative impacts by improving fish habitat and the ability of the streams to support enhanced fish passage provided that non-native fish species are not introduced into upstream populations.

Scenic Resources and Aesthetics
Bridge and road replacement would need to be addressed on a project-specific basis. Removing a number of historic bridges could cause a visual impact. However, by removing a bridge in a natural area, the natural landscape could be improved thus creating a beneficial impact.

Land and Shoreline Use
Implementation of this alternative may result in unavoidable permanent relocation of access points to roadways.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified for the alternative in Section 6.1.3. Cumulative impacts may result from the removal of multiple historic properties in a given area through time.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Transportation
This alternative may require a significant level of financial commitment on the part of transportation utilities to replace existing infrastructure.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.46 Alternative WP 46: Support construction of fish passage facilities where such facilities do not currently exist.

6.46.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Construction of fish passage facilities may have short-term construction effects similar to those described in Section 6.2.1.

Ground Water

Short-term impacts

Short-term construction-related impacts from implementation of this alternative would be the same as those described in Section 6.19.1.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Wildlife

Short-term impacts

The short-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

The long-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.45.1.

Energy and Natural Resources

Short-term impacts

Construction of fish passage structures may require short-term ground water and surface water control measures during the construction period. Such measures could consume electricity or gasoline/diesel resources.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from constructing fish passage facilities would be similar to those described in Section 6.20.1.

Environmental Health

Short-term impacts

Temporary and minor construction-related health and safety impacts to workers could occur due to construction activities conducted as part of the implementation of this alternative. Potential impacts related to construction noise and hazardous substances due to minor construction activities are described in Section 6.2.1.

Land and Shoreline Use

Short-term impacts

Potential short-term impacts to land and shoreline use associated with this alternative are similar to those described in Section 6.42.1. In addition, this alternative may require land acquisition for construction of fish passage projects.

Long-term/operational impacts

Implementation of this alternative may require new or modified property access for maintenance in the areas affected by the fish passage projects. In addition, if the newly constructed fish passage facilities result in the re-introduction of fish species listed under the Endangered Species Act (ESA) to areas where access had previously been denied, property owners in the area of re-introduction make have exposure to the "take" prohibitions of the federal Endangered Species Act.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Restoring fish passage may provide a beneficial effect in streams or reaches with traditional cultural significance by improving traditional fishing grounds.

Recreation

Short-term impacts

Access to streams or rivers may be temporarily denied during the construction of the project.

Long-term/operational impacts

Long-term impacts to recreational opportunities are anticipated to be positive, as fishing upstream of former fish passage obstructions may improve.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1

6.46.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Mitigation measures appropriate to offset short-term effects of construction are similar to those described in Section 6.2.2.

Ground Water

Mitigation measures for temporary construction-related impacts to ground water associated with this alternative are the same as those discussed in Section 6.19.2.

Plants

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented.

Wildlife

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented.

Energy and Natural Resources

Mitigation measures are similar to those discussed in Section 6.45.2.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and workers, and to minimize impacts associated with hazardous substances, are identified in Section 6.1.2.

Land and Shoreline Use
Measures to mitigate impacts to land and shoreline use from this alternative include providing advance notification to property owners likely to be affected, and negotiating access with adjacent property owners prior to project commencement.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.46.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Wildlife
This alternative, in conjunction with other fish recovery and enhancement projects, will have positive cumulative impacts if implemented broadly within a watershed. Improving fish habitat will ultimately develop more sustainable aquatic communities.

Land and Shoreline Use
If this alternative leads to the re-introduction of Endangered Species Act listed fish species into areas upstream of removed barriers, adjacent property owners in such areas may be have exposure to liability associated with the "take" prohibitions of that act.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.47 Alternative WP 47: Implement habitat improvement projects involving out-of-stream riparian restoration or enhancement such as replanting or bank stabilization projects. Bioengineering methodologies should be incorporated into bank stabilization projects.

6.47.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts of this alternative are likely to fall in the range of impacts described in Sections 6.1.1 and 6.2.1.

Long-term/operational impacts

Over time, trees or other vegetation will provide increasing shade as vegetation grows, resulting in long-term decreases in stream temperature in water bodies less than approximately 75 feet in width.

Plants

Short-term impacts

The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts

Long-term impacts from implementation of this alternative include improvement to riparian plant communities.

Wildlife

Short-term impacts

The short-term impacts to aquatic and wildlife communities are predicted to be similar to those construction-related impacts described in Section 6.2.1.

Long-term/operational impacts

Long-term positive impacts from implementation of this alternative include improvement of aquatic habitat and the health of fish populations.

Scenic Resources and Aesthetics

Short-term impacts

Short-term impacts from habitat improvement projects are anticipated to be similar to those described in Section 6.1.1.

Long-term/operational impacts

Areas of high visual appeal may not necessarily benefit from a habitat restoration project. However, in an area of low visual quality, habitat improvement projects may restore or improve scenic quality.

Environmental Health

Short-term impacts

Temporary construction-related health and safety impacts are similar to those described in Section 6.1.1.

Land and Shoreline Use

Short-term impacts

Short-term impacts associated with property access are similar to those described in Section 6.42.1.

Long-term/operational impacts

Implementation of bank stability and habitat improvement projects is anticipated to have positive long-term impacts by decreasing bank erosion on adjacent properties.

Cultural Resources

Short-term impacts

Short-term construction impacts to archaeological resources would be similar to those described in Section 6.1.1. Riparian restoration actions such as replanting and bank stabilization can adversely affect cultural resources present in the area.

Long-term/operational impacts

Habitat improvement projects may result in beneficial effects to traditional use of significant waterways by improving fish habitat.

Recreation

Short-term impacts

Short-term impacts from habitat improvement projects would be similar to those described in Section 6.20.1.

Long-term/operational impacts

New recreation opportunities such as fishing may develop or improve from upgrading habitat.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1. This alternative could require additional truck trips to haul large woody debris or other bank stabilization or to remove excavated materials. The number of trips and their impact on traffic and roads would depend on the size and location of the project.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1

6.47.2 Mitigation Measures

Earth

Mitigation measures for impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

The mitigation measures for the short-term construction-related impacts are described in Section 6.1.2.

Plants

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to address short-term impacts.

Wildlife

Where construction is involved, the mitigation measures described in Section 6.2.2 should be implemented to address short-term impacts.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and to minimize impacts to workers associated with construction are described in Section 6.2.2.

Land and Shoreline Use

Potential mitigation measures include collaboration with affected property owners concerning access and maintenance issues.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.47.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Wildlife
Implementation of this impact throughout a watershed, combined with other fish habitat improvements, is anticipated to improve the health and stability of fish populations.

Scenic Resources and Aesthetics
Significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.48 Alternative WP 48: Move river dikes back from existing river channel to allow for floodplain restoration and channel maintenance.

6.48.1 Impacts

Earth

Short-term impacts

Short-term impacts to earth resources associated with this alternative could occur during construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in Section 6.1.1.

Long-term/operational impacts

Long-term impacts could include the consumption of potentially significant quantities of fill material for use in rebuilding dikes. In addition, significant erosion and re-deposition would likely occur over time as the river reworks areas that were formerly behind the dikes and reforms channels and floodplains.

Air

Short-term impacts

Short-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Long-term/operational impacts

Long-term impacts on air quality from this alternative would be the same as described in Section 6.1.1.

Surface Water

Short-term impacts

Short-term impacts to surface water quality are similar to those described in Section 6.2.1.

Long-term/operational impacts

In the long-term, the stream will mobilize and deposit sediment until it develops a new channel within the constraints of the wider floodplain. For a time, this may result in increases in turbidity and increases in downstream sediment loads. The changes in channel morphology will eventually stabilize and the effects on water quality will become insignificant.

Ground Water

Long-term/operational impacts

Implementation of this alternative could increase the net amount of ground water recharge in the floodplain area. The magnitude of this effect would depend on the relative area of additional floodplain created by the relocation of the dikes and the degree to which surface water from this area would infiltrate to ground water (e.g., increased recharge would not be expected due to this alternative in ground water discharge areas).

Plants

Short-term impacts
The short-term impacts to plant communities are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts
Depending on the specific dike alteration and restoration project implemented, riparian and upland plant communities are likely to benefit through increased native plant presence and diversity. Floodplain restoration may also provide for the development of riparian corridors.

Wildlife

Short-term impacts
The short-term impacts to fish and wildlife are predicted to be similar to those described in Section 6.2.1.

Long-term/operational impacts
There are exceptions, but in general, restoring old floodplains tends to improve both aquatic and terrestrial habitat. The restoration of natural channel configurations tends to improve the abundance of pools and the sorting of spawning gravels. Fish production is therefore improved. If projects include restoration of stream adjacent habitat, wood recruitment to streams will be enhanced, thereby improving fish habitat. Terrestrial habitat will also be improved for riparian dependent species. Riparian dependent bird species will have expanded habitat available. The development of expanded riparian corridors may also provide migration corridors for terrestrial species.

Scenic Resources and Aesthetics

Short-term impacts
Short-term impacts from removing river dikes would be similar to those described in Section 6.1.1.

Long-term/operational impacts
In areas of the floodplain where habitat is degraded, then habitat improvement projects may restore scenic resources and aesthetics, and degraded habitat may improve.

Environmental Health

Short-term impacts
Temporary construction-related health and safety impacts related to construction noise and hazardous substances are described in Section 6.1.1.

Land and Shoreline Use

Short-term impact
Construction activities may require property acquisition or negotiation of property access agreements for relocation or moving of dikes.

Long-term/operational impacts

Implementation of this alternative could require the relocation of existing structures due to flood risks; if not relocated, such structures may be damaged by flood waters. In some cases, property may need to be condemned. Future land use within the floodplain may be reduced or limited due to flood damage risks.

Cultural Resources

Short-term impacts

Short-term construction impacts would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Long-term operational impacts to archaeological or architectural resources may include erosion or inundation in areas where water levels change as a result of floodplain restoration. Rising and falling water levels and wave action can adversely affect archaeological resources by eroding the site, resulting in a loss of context of artifacts and features, as well as artifact abrasion. Architectural resources also may be eroded by changing water levels.

Implementation of this alternative may have positive impacts by restoring streams with cultural significance to a condition more similar to natural conditions.

Recreation

Short-term impacts

Short-term impacts from removing river dikes would be similar to those described in Section 6.1.1.

Long-term/operational impacts

Recreational use and access may change as a result of this alternative. If a recreation facility such as a campground were located within a floodplain, it would need to be moved to a different location. On the other hand, if the floodplain is broadened or more side channels are created, other types of activities could be supported within the floodplain restoration area, such as hunting or fishing.

Transportation

Short-term impacts

Impacts to transportation systems may result from construction activities. Short-term impacts from construction are described in Section 6.1.1. In addition, this alternative would likely require significant numbers of truck trips to haul fill materials and to remove excavated materials. The number of trips and the level of impact on traffic and roads would depend on the size and location of the project.

Long-term/operational impacts

Implementation of this alternative could require the relocation of roads, highways, bridges, railroads, or other transportation infrastructure in the project area. This would potentially result in minor to moderate impacts on transportation systems, depending on the number of vehicles affected by the relocation, the number of road/highway/railroad miles that are relocated, and the distances involved.

Public Services and Utilities

Short-term impacts

Short-term impacts are similar to those described in Section 6.42.1. In addition, implementation of this alternative may require relocation of sewer lines, sewer outfalls, water lines, and other utilities. Local governments may need to amend land use plans, shoreline master programs, and floodplain management plans to reflect relocation of river dikes.

Long-term/operational impacts

Long-term impacts are similar to those described in Section 6.42.1

6.48.2 <u>Mitigation Measures</u>

Earth

Mitigation measures for temporary construction-related impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2. Mitigation for the erosion and re-deposition that would occur following dike removal would not be appropriate, since the restoration of floodplains and channels is the objective this alternative.

Air

Air quality mitigation measures for this alternative would be the same as described in Section 6.1.2.

Surface Water

Mitigation measures for short-term impacts to water quality are described in Section 6.1.2. Mitigation for longer-term impacts as the channel redistributes itself into the new floodplain may be addressed through placement of wood and other structures that create roughness in the channel and direct flow in the nearer term.

Plants

Mitigation measures for the short-term impacts of construction as described in Section 6.2.2 should be implemented.

Wildlife

Mitigation measures for the short-term impacts of construction as described in Section 6.2.2 should be implemented.

Scenic Resources and Aesthetics

Where construction is involved, the mitigation measures described in Section 6.1.2 should be implemented.

Environmental Health

Potential mitigation measures to reduce noise impacts to area residents and to minimize impacts to workers associated with hazardous substances are identified in Section 6.1.2.

Land and Shoreline Use
The following measures could mitigate impacts to land and shoreline use from this alternative:

- Provide advance notification of construction activities to affected property owners;

- Collaborate with community groups and affected owners in formulating plans for dike relocation; and

- Develop a compensation plan for the affected property owners.

Cultural Resources
Mitigation measures for short-term construction impacts would be similar to those described in Section 6.1.2. Mitigation measures for long-term operational impacts may include measures identified for short-term impacts, as well as site stabilization measures.

Recreation
The recreation site located within a floodplain would need to be reviewed on a project-specific basis. As discussed, a campground located in a floodplain may have to be moved to another area. However, if hunting and undeveloped recreation were taking place in the floodplain, then the outlying areas would need to be reviewed to establish whether they could sustain greater hunting pressure. In some cases, no mitigation measures may be needed as an area may be underutilized for hunting.

Transportation
Potential mitigation measures to reduce short-term transportation impacts from construction activities are identified in Section 6.1.2. To reduce the impact of relocations of roads, highways, railroads, and bridges, appropriate directional signs could be installed and the public media used to communicate the modifications to the public and thereby reduce confusion. Replacement roads, road segments, or bridges could be constructed prior to the completion of the channel modifications to avoid flood damage.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.48.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth
Cumulative and significant unavoidable adverse impacts to earth resources associated with this alternative are the same as those discussed in Section 6.5.3.

Air
Cumulative impacts and significant unavoidable adverse impacts for this alternative would be the same as described in Section 6.1.3.

Surface Water
Some longer-term adverse impacts are to be expected as the channel settles into its new configuration. Downstream sediment mobilization and associated turbidity increases would be

considered significant unavoidable impacts. However, these impacts will subside as the channel stabilizes and settles into its new configuration. Cumulative impacts could be realized if this alternative is implemented in many streams across the state.

Land and Shoreline Use
Significant unavoidable adverse impacts may include changes in property ownership and/or changes in land use types. Some previously permitted uses may no longer be possible.

Cultural Resources
Cumulative impacts and significant unavoidable adverse impacts would be similar to those identified in Section 6.1.3.

Recreation
Cumulative impacts and significant unavoidable adverse impacts under this alternative would be the same as those described in Section 6.1.3.

Transportation
Although construction impacts would be short-term and temporary, implementation of this alternative could result in cumulative and significant unavoidable impacts to transportation systems, depending on the location and size of the project associated with dike changes, due to the potential impacts on road/highway/railroad relocations. Major relocation projects would require significant expenditures. Money spent on relocation would not be available for other projects.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 3.42.3.

6.49 Alternative WP 49: Request local governments to amend or modify Growth Management Act comprehensive plans or other land use plans, shoreline master programs, and/or critical area ordinances to protect habitat or control floodplain development.

6.49.1 <u>Impacts</u>

Surface Water

Long-term/operational impacts

Protection of habitat and control of floodplain development may protect water quality in streams and other water bodies. Plans may also include elements that will result in the restoration and/or enhancement of habitat. These elements may also improve or enhance water quality by modifying sediment inputs and providing filtration of other nonpoint source pollutants. The rate and magnitude of improvement will be dependent upon the requirements of individual plans.

Ground Water

Long-term/operational impacts

Implementation of this alternative could serve to protect the quantity and quality of ground water recharge by potentially limiting the amount of impermeable surfaces and contaminant sources associated with development in or near flood plains. The magnitude of these effects would depend on whether these areas act as recharge areas to ground water (e.g., recharge protection would not be expected in ground water discharge areas).

Plants

Long-term/operational impacts

Depending on the specific program or ordinance amendments implemented, riparian habitats are likely to benefit from habitat protection or improvement projects.

Wildlife

Long-term/operational impacts

Depending on the specific program or ordinance amendments implemented, fish and wildlife are likely to benefit from habitat protection or improvement projects.

Scenic Resources and Aesthetics

Long-term/operational impacts

Protecting habitat and controlling floodplain development may contribute to the protection or restoration of scenic resources and aesthetics.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative could result in long-term impacts to land and shoreline use. Land use activities that are detrimental to habitat or floodplain function may be restricted. This could increase development costs, which may subsequently result in increased property and housing costs.

Recreation

Long-term/operational impacts

This alternative may preserve lands used for recreation thereby increasing recreational opportunities in the area and possibly greater access points. In larger stretches of land, increased hunting, fishing, etc., would also take hunting pressures off adjoining land thereby possibly increasing the quality of the recreation experience. Other types of recreation could include hiking, camping, nature viewing, photography, etc.

Transportation

Long-term/operational impacts

Modification of Growth Management Act, comprehensive plans, and/or other land use plans may result in modifications to long-range plans for transportation infrastructure. Location and design of new transportation infrastructure will need to be consistent with the revised land use plans or revised shoreline master programs. This will result in a more significant impact in areas of the state where rapid urban growth is occurring, and could potentially result in adverse impacts to transportation systems in shoreline areas.

Public Services and Utilities

Short-term impacts

Amendment and/or approval of plans, programs, and ordinances would likely require additional local government resources. In addition, Growth Management Act comprehensive plans, shoreline master programs, and critical areas ordinances require review by state agencies.

6.49.2 Mitigation Measures

Land and Shoreline Use

Potential mitigation measures are similar to those identified in Section 6.40.2. In addition, by observing proper public process, local governments can ensure that potentially affected property owners are afforded an opportunity to provide input to the planning process. The content of proposed plan amendments can be structured to accommodate that input.

Public Services and Utilities

Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.49.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Wildlife

The cumulative impacts of implementation of this alternative in conjunction with other efforts to improve fish habitat are likely to benefit fish populations and other aquatic species.

Land and Shoreline Use
This alternative, when considered in combination with other constraints on development, would likely contribute to cumulative impacts to land and shoreline use. This could result in increased difficulty in siting new development near sensitive habitat, floodplains, and shoreline areas.

Transportation
This alternative, when considered in combination with other increasing constraints on development of transportation infrastructure, would likely contribute to cumulative impacts to transportation systems. Increased difficulty in siting roads, highways, and bridges near sensitive habitat, flood plains, and shoreline areas would be a significant unavoidable adverse impact from this alternative.

Public Services and Utilities
Cumulative impacts are the same as those described in Section 6.42.3.

6.50 Alternative WP 50: Request local governments to develop regulations or programs to control sources of sediment that are not addressed through critical areas ordinances or other existing regulations and programs.

6.50.1 Impacts

Surface Water

Long-term/operational impacts

There are numerous existing sediment sources that are not addressed through planning or regulatory processes; and the degree to which they are addressed is highly variable across the state. Erosion of sediments from hill slopes during construction is typically controlled by local ordinances. Other sources of sediment such as roads, livestock areas, landscaping activities, agricultural uses, and sanding of roads in winter are not necessarily controlled consistently throughout the state. Programs that are designed to reduce these sediment sources may reduce sediment inputs to streams and subsequently reduce turbidity and fine sediment in substrate.

Plants

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Wildlife

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Scenic Resources and Aesthetics

Long-term/operational impacts

Controlling sources of sediment may contribute to the protection or restoration of scenic resources and aesthetics.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative may result in long-term impacts to land and shoreline use, in that it would likely result in imposition of new development standards or requirements.

Public Services and Utilities

Short-term impacts

Development and adoption of regulations and/or program development would likely require additional local resources.

Long-term/operational impacts
Administration and enforcement of regulations and/or program implementation would require a long-term commitment of local agency resources.

6.50.2 Mitigation Measures

Land and Shoreline Use
Potential mitigation measures are identified in Sections 6.40.2 and 6.49.2.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.40.2.

6.50.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts to land and shoreline use associated with this alternative are described in Section 6.49.3. Additionally, the cumulative impacts may become more apparent as other regulatory and planning efforts seeking to protect habitat are implemented.

Public Services and Utilities
The impact to state and local agencies associated with implementation of this alternative would be cumulative with impacts associated with those agencies' other responsibilities and obligations.

6.51 Alternative WP 51: Request local governments to integrate habitat improvement planning into flood hazard reduction plans.

6.51.1 Impacts

Surface Water

Long-term/operational impacts

Habitat improvement plans that incorporate restoration of riparian areas may reduce water temperature in streams. The improvement would be slow but effective.

Plants

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Wildlife

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative may result in long-term impacts on land and shoreline use in that it would likely affect future land use decisions in floodplains. This alternative would also require coordination with land use plans.

Transportation

Long-term/operational impacts

Implementation of this alternative could result in modifications to long-range plans for transportation infrastructure. Location and design of new transportation infrastructure will need to be consistent with habitat improvement and flood hazard reduction plans.

Public Services and Utilities

Short-term impacts

Planning efforts under this alternative would likely require additional local agency resources.

6.51.2 Mitigation Measures

Land and Shoreline Use

Mitigation measures described in Section 6.49.2 are also applicable to this alternative.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2. In addition, it should be noted that Ecology regularly provides grants for flood hazard reduction planning.

6.51.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use
Cumulative and significant unavoidable adverse impacts to land and shoreline use associated with this alternative are described in Section 6.49.3.

Transportation
Cumulative and significant unavoidable adverse impacts to transportation systems associated with this alternative are described in Section 6.49.3.

Public Services and Utilities
Cumulative impacts associated with implementation of this alternative are the same as those discussed in Section 6.50.3.

6.52 Alternative WP 52: Request conservation districts and irrigation districts to assist in achieving protection of habitat including, as appropriate, establishment and maintenance of riparian buffers and control of erosion and sedimentation.

6.52.1 <u>Impacts</u>

Surface Water

Long-term/operational impacts
The long-term effects of this alternative on surface water quality will be positive and similar to that described in Section 6.33.1.

Plants

Long-term/operational impacts
Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Wildlife

Long-term/operational impacts
Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Scenic Resources and Aesthetics

Long-term/operational impacts
Protecting habitat may contribute to the protection or restoration of scenic resources and aesthetics.

Land and Shoreline Use

Long-term/operational impacts
Implementation of this alternative may result in long-term impacts to land and shoreline use as private land owners may be requested to modify land use and water use practices adjacent to water bodies.

Public Services and Utilities

Short-term impacts
Habitat protection measures and associated public outreach activities would likely require expenditure of conservation district and/or irrigation district resources. Habitat protection measures may trigger state and local permitting requirements.

6.52.2 <u>Mitigation Measures</u>

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2. In addition, it should be noted that cost share funding administered by the National

Resources Conservation Service and conservation districts may help offset some of the cost impacts of this alternative.

6.52.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
Cumulative effects of this alternative on surface water quality are expected to be similar to those described in Section 6.33.3.

Land and Shoreline Use
Cumulative impacts of the implementation of this alternative may be realized, particularly in conjunction with other requests or requirements for water quality and habitat improvement, such as those described in Section 6.33.3. Successful implementation may require a commitment of resources by conservation and irrigation districts and landowners. On the other hand, potential beneficial impacts include an overall reduction in damage to waterfront property due to erosion.

Public Services and Utilities
The impacts to conservation districts and irrigation districts associated with implementation of this alternative would be cumulative with impacts associated with those districts' other responsibilities and obligations.

6.53 Alternative WP 53: Request local, state, and federal governments, conservation districts, and private entities to acquire land and/or conservation easements for purposes of protecting habitat.

6.53.1 Impacts

Surface Water

Long-term/operational impacts

This alternative may reduce future degradation of water quality.

Plants

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.51.1.

Wildlife

Long-term/operational impacts

Implementation of this alternative would have impacts similar to those described in Section 6.51.1.

Scenic Resources and Aesthetics

Long-term/operational impacts

Protecting habitat may contribute to the protection or restoration of scenic resources and aesthetics.

Land and Shoreline Use

Long-term/operational impacts

Implementation of this alternative would require the cooperation of owners of property with habitat requiring protection. If not well managed, this alternative could result in degradation of habitat areas as a result of vandalism or overuse by the public.

Public Services and Utilities

Short-term impacts

If acquisition of land or easements is undertaken by a public agency, it may require additional federal, state, or local resources.

Long-term/operational impacts

If lands that would ordinarily be available for development are acquired and set aside as open space, there may be an adverse impact on the jurisdictional local government's future property tax revenues. If acquired lands or easements are publicly managed, such management may require additional resources to prevent vandalism and to prevent public access to adjacent private properties.

6.53.2 Mitigation Measures

Land and Shoreline Use
Potential mitigation measures include:

- Working with adjacent property owners in initiating a stewardship program;
- Posting of signs to increase public awareness of habitat protection in the conservation easement areas; and
- Strict enforcement of laws against vandalism.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2. In addition, planning units or entities contemplating acquisitions of properties and easements should collaborate with jurisdictional local legislative jurisdictions and their representative agencies to ensure such acquisitions compatible with local land use and natural resources plans and strategies.

6.53.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use
If large amounts of land are acquired or set aside by easement, the amount of land available for private use and development would diminish. This could create greater competition for remaining lands and result in increased property costs. This impact would be most pronounced in areas where a significant amount of land is already under government ownership (for example, National Forests).

Public Services and Utilities
If federal, state, or local agencies are responsible for acquisition of land or easements, implementation of this alternative could result in cumulative impacts when considered in the context of all other financial and resource obligations that would result from watershed plans.

6.54 Alternative WP 54: Request Ecology and local governments to increase the level of enforcement of Shoreline Management Act violations in critical habitat areas.

6.54.1 Impacts

Surface Water

Long-term/operational impacts
This alternative may reduce the occurrence of activities that degrade water quality.

Plants

Long-term/operational impacts
Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Wildlife

Long-term/operational impacts
Implementation of this alternative would have impacts similar to those described in Section 6.49.1.

Land and Shoreline Use

Long-term/operational impacts
Implementation of this alternative may restrict or alter land use activities that are detrimental to critical habitat areas.

Transportation

Long-term/operational impacts
Enforcement of shoreline master programs in critical habitat areas should not result in modifications to existing transportation infrastructure, assuming that the existing location and design of that transportation infrastructure is in compliance with the local shoreline master program. No long-term adverse impacts are likely.

Public Services and Utilities

Short-term impacts
Increased enforcement of the Shoreline Management Act and Shoreline Management Programs would likely require additional state and local resources.

Long-term/operational impacts
If such enforcement actions are sustained over a relatively long period of time, implementation of this alternative may necessitate a long-term commitment of state and local resources.

6.54.2 Mitigation Measures

Land and Shoreline Use

Potential mitigation measures are identified in Section 6.40.2. Additionally, compliance periods could be extended for affected property owners, or collaborative resolutions could be developed with the affected owners

Public Services and Utilities

Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2. In addition, the planning unit should work with the local shorelines jurisdictional agency and Ecology to determine the extent to which resources may be available for implementation of this alternative.

6.54.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Land and Shoreline Use

When considered in combination with other increasing constraints on new development, this alternative could contribute to cumulative impacts to land and shoreline use.

Public Services and Utilities

Cumulative impacts associated with this alternative are the same as those described in Section 6.42.3.

6.55 Alternative WP 55: Require proponents of new or expanding fish hatcheries to follow the recommendations of the Hatchery Science Review Team regarding siting, interaction with native stocks, and water quality.

6.55.1 Impacts

Surface Water

Long-term/operational impacts

Improvements in water quality may occur at expanding fish hatcheries. New facilities will have less impact on water quality; however, some level of effect would still be expected.

Ground Water

Long-term/operational impacts

The Hatchery Scientific Review Group made no area-wide recommendations that specifically addressed ground water. The group has recommended that ground water be considered for use at the Wallace River Hatchery (Skykomish River watershed). Use of ground water would be expected to decrease the unacceptably high loss rate associated with the use of river water at the hatchery. Depending on the amount of water required for these operations and on the local hydrogeologic conditions, ground water withdrawals may incrementally reduce ground water levels in the vicinity of the hatchery production well(s). Although the report makes no programmatic recommendations regarding use of ground water at hatcheries, possible reductions in ground water levels may occur at other new or expanding hatcheries should they initiate or increase the use of ground water for hatchery operations.

Wildlife

Long-term/operational impacts

Hatcheries have been identified as one of the four major issues affecting salmon production (the four are hatcheries, habitat, hydropower, and harvest). Reliance on hatchery production of fish has resulted in introduction of new species into basins (some of which are out-competing native species), adverse genetic mixing of stocks, introduction of exotic diseases, and over fishing of natural runs (hatchery fish can withstand higher harvests than naturally spawning fish). The recommendations of the Hatchery Science Review Group address these issues. If those recommendations are carefully followed, historical impacts of hatcheries may largely be avoided. Additionally, well-planned hatchery projects may be used to enhance native runs, including endangered species, and could potentially be very helpful in the restoration of historic runs.

Land and Shoreline Use

Short-term impacts

Implementation of this alternative may result in short-term impacts to land and shoreline use by increasing the costs associated with construction of commercial hatcheries.

Long-term/operational impacts

Implementing the recommendations of the Hatchery Science Review Group, such as providing new water source(s) to provide warmer rearing water for salmon, providing off-channel rearing habitat by opening side channels and removing intake barriers, promoting long-term salmon habitat improvements, and closing or resizing hatcheries, may result in long-term adverse economic impacts to proponents of new or expanding fish hatcheries. These impacts will be partially offset by increased efficiencies identified by the reform process.

Cultural Resources

Long-term/operational impacts

Hatchery management recommendations may improve or maintain streams or reaches with traditional cultural significance, providing a beneficial effect.

Recreation

Long-term/operational impacts

Implementation of the recommendations of the Hatchery Science Review Group could have the long-term positive benefits of improving recreational fishing opportunities by increasing fish productivity.

Public Services and Utilities

Short-term impacts

Implementation of the Hatchery Science Review Group's recommendations could increase costs associated with construction of publicly owned hatcheries.

Long-term/operational impacts

This alternative may increase costs associated with operation of public hatcheries.

6.55.2 Mitigation Measures

Land and Shoreline Use

Potential mitigation measures include requesting resources to aid in the implementation of the Hatchery Science Review Group recommendations from the federal government, foundations, corporations, and other private entities with a stake in salmon recovery.

6.55.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Wildlife

Regionally, a well-planned and carefully implemented hatchery program could have positive cumulative impacts by restoring fish runs, including endangered stocks of salmon and bull trout. However, if the recommendations of the Hatchery Science Review Team are not carefully followed, large-scale adverse impacts could occur through species introductions, introduction of disease, and/or genetic mixing.

Land and Shoreline Use

There may be some unavoidable long-term cost increases to proponents of new or expanding fish hatcheries associated with the implementation of this alternative. These impacts will be partially offset by increased efficiencies.

6.56 Alternative WP 56: Support implementation of the recommendations of Washington's Forests and Fish Report.

6.56.1 Impacts

Earth

Long-term/operational impacts

This alternative will have a positive impact on earth resources by reducing erosion associated with forest practices, including erosion of new and existing roads. The new forest practices rules adopted under the Forests and Fish Report will also significantly reduce landslide rates on forested lands across the state.

Surface Water

Long-term/operational impacts

Compliance with the new forest practices rules will reduce the effects of forestry operations on sediment inputs to streams, stream temperature, and stream flow. Stream temperature and sediment inputs will slowly decrease over time as trees grow in riparian areas and high hazard landslide areas and roads systems are improved.

Ground Water

Long-term/operational impacts

Implementation of this alternative may improve ground water quality by reducing contamination (e.g., nutrients and pesticides) of surface water bodies that may recharge ground water. This alternative may also increase ground water quantity by specifying that forest road-building be performed so as to minimize the capture and redirection of ground water.

Plants

Long-term/operational impacts

The newly promulgated forest practices rules adopted as a result of the Forests and Fish Report will, once implemented, result in significant changes in the treatment of riparian areas on forested lands. On the western side of the state, riparian stands will be managed to a mature condition reflective of approximately 140-year old stands. On the eastside, stands will be managed to historical stand conditions, which varied by stand type and have been affected over time not only by harvest but also fire prevention. The new rules extend riparian protection further upstream, including some protection along non-fish bearing streams. Protection of wetlands on forested land has also been modified. The new rules will also leave patches of trees in higher landslide potential areas and will encourage the conversion of alder dominated stands to historical conifer dominated stands.

Wildlife

Long-term/operational impacts

The Forests and Fish Report was specifically written to address aquatic resources. Three of the four goals of the report are to: 1) meet state water quality standards; 2) provide habitat for harvestable populations of fish; and 3) provide habitat to support viable populations of amphibians (paraphrased). The fourth objective was to provide for a viable forest industry. The new rules contain requirements for improvements in the management of riparian areas and landslide hazard areas. They contain provisions to protect amphibian habitat and to reduce surface erosion to streams. They contain provisions for major upgrades of all forest roads to hydrologically disconnect those roads from streams and to ensure fish passage through culverts. The report also includes an adaptive management program through which the effectiveness of the rules will be tested and the rules themselves will be modified if studies indicate the need. Implementation of the new rules is expected to result in gradual improvement in water quality, and fish and amphibian habitat.

The new forest practices rules did not address terrestrial wildlife as thoroughly as aquatic resources. Implementation of the rules is predicted to result in improvements in riparian habitat. Additionally, islands of habitat will be left in high landslide hazard zones. Additional modifications to the rules cover wildlife leave trees and the abundance of downed wood. These changes will likely result in some positive improvement in terrestrial wildlife habitat.

Scenic Resources and Aesthetics

Long-term/operational impacts

Improved forest practices may or may not result in improvements to scenic visual resources. However, because visual resources are perception-related, impacts may be considered adverse. For example, tree thinning may be considered a beneficial forest practice, but from a scenic viewpoint, it may appear to some observers as a scarring of the forest. Each individual forest practice would need to be considered on a location-specific basis.

Land and Shoreline Use

Short-term impacts

Short-term land-use impacts associated with this alternative may occur. Potential short-term impacts to owners of private timberlands include the cost of implementation of the Forests and Fish Report.

Long-term/operational impacts

Implementation of this alternative may result in long-term land use impacts in that it may require a long-term commitment of resources by owners of private timberlands.

Public Services and Utilities

Long-term/operational impacts

The Forest Practices Act is already being implemented by the Washington State Department of Natural Resources and private forest land owners.

6.56.2 <u>Mitigation Measures</u>

Land and Shoreline Use

The Washington State Department of Natural Resources' Small Land Owner Office may be able to assist some land owners in complying with the Forest Practices Act.

Public Services and Utilities
Mitigation measures associated with this alternative are the same as those discussed in Section 6.42.2.

6.56.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Surface Water
The reductions in pollutant loads through forest practices will accumulate over time as the rules are implemented across the forested landscape.

Ground Water
The impacts of the new forest practices rules on ground water resources are not well known. Their implementation may improve ground water quality. These improvements would arise primarily from improvements in surface water quality in reaches where ground water is recharged. These improvements may accumulate over time and lead to an overall increase in ground water quality. The adaptive management program associated with implementation of the rules will assess impacts to ground water.

Plants
Implementing actions based on the new forest practices rule is expected to have positive cumulative benefits to wetlands and riparian zones by providing for reduced habitat disturbance and measures to enhance or buffer impacts.

Wildlife
Cumulatively, the Forests and Fish Report is expected to have significant positive effects on the availability of fish habitat statewide. Habitat quality and fish passage on forested land should improve over time. The net benefit of the rules will be limited by other downstream land uses such as roads and water diversions that block fish migration and harvest of fish.

Land and Shoreline Use
Unavoidable increased costs to the landowners may be incurred from implementation of the Forests and Fish Report recommendations.

6.57 Alternative WP 57: Take no action regarding habitat.

6.57.1 Impacts

Earth

Long-term/operational impacts

Impacts to earth resources from taking no action to protect, restore, or enhance riparian habitat could include long-term increases in erosion of stream banks from the absence or loss of protective vegetation.

Surface Water

Short-term impacts

Short-term effects of the “No Action” alternative on water quality would be similar to those described in Section 6.41.1.

Long-term/operational impacts

The “No Action” alternative may have long-term adverse effects on surface water quality as described in Section 6.41.1.

Ground Water

Long-term/operational impacts

Taking no action regarding habitat could result in a lack of improvement or a decline in ground water quantity or quality if the actions that are not taken would have resulted in an increase in the quality or quantity of recharge to ground water.

Plants

Long-term/operational impacts

Taking no action to protect, enhance, or restore riparian and/or upland habitats may result in the degradation or loss of important native plant communities.

Wildlife

Long-term/operational impacts

Taking no action to protect, enhance, or restore aquatic and/or riparian habitats may have adverse impacts on the health of fish and wildlife, and may pose a threat to species listed under endangered species legislation.

Scenic Resources and Aesthetics

Long-term/operational impacts

Failure to protect, restore, or enhance aquatic and/or riparian habitat may have adverse impacts such as land scarring from erosion on scenic resources and aesthetics associated with rivers and other bodies of water.

Land and Shoreline Use

Long-term/operational impacts

Failure to protect or restore aquatic and riparian habitat may be contrary to the Growth Management Act and the Shoreline Management Act. It may contribute to a diminished quality of life and reduced land values in some communities.

Cultural Resources

Long-term/operational impacts

Failure to provide water to restore or enhance instream resources may result in adverse effects to bodies of water with traditional cultural significance.

Recreation

Long-term/operational impacts

If adequate aquatic and riparian habitats are not available to support healthy fish populations, recreational fishing opportunities may be reduced. Failure to protect or restore aquatic and riparian habitat may lessen the quality of the recreational experience.

6.57.2 Mitigation Measures

The "No Action" alternative assumes that fish habitat would continue to be managed through the existing framework of federal, state, local, and tribal programs and fisheries management practices. In some watersheds, existing systems may be adequate to protect fish populations, while in other watersheds significant impacts may be experienced or continue to be experienced without implementation of additional mitigating measures.

6.57.3 Cumulative Impacts and Significant Unavoidable Adverse Impacts

Earth

Cumulative impacts to earth resources from taking no action to protect, restore, or enhance riparian habitat could include long-term increases in erosion of stream banks from the absence or loss of protective vegetation.

Surface Water

Cumulative effects of this alternative on surface water quality are similar to those discussed in Section 6.41.3.

Ground Water

Cumulative impacts of taking no action regarding habitat statewide could include a regional lack of improvement or a decline in ground water quantity or quality if the actions that are not taken would have resulted in an increase in the quality or quantity of ground water recharge.

Plants

Taking no action may result in continued degradation of aquatic and riparian plant habitat within watersheds. Further impacts to threatened and endangered species may occur.

Wildlife
Taking no action to protect, enhance, or restore aquatic and/or riparian habitats used for spawning, rearing or foraging may have adverse impacts on the health of fish and wildlife, and may pose a threat to species listed under endangered species legislation.

Scenic Resources and Aesthetics
Cumulative impacts could occur to scenic resources and aesthetics if other projects in the area affect the landscape. A reduction in the quality of habitat across the state could hinder scenic resources and aesthetics restoration under this alternative.

Land and Shoreline Use
Taking no action may contribute to the diminished quality of life in those watersheds in which aquatic and riparian habitat is already degraded. Taking no action may conflict with the Growth Management Act or Shoreline Management Act. This alternative may have the adverse impacts of diminishing land value in some communities.

Cultural Resources
Significant unavoidable adverse impacts may result from failure to provide water to restore or enhance bodies of water with traditional cultural significance.

Recreation
Cumulative impacts could occur to recreation resources if other projects in the area affect recreation access and use. A reduction in the quality of habitat across the state could hinder fishing opportunities and reduce the qua lity of the recreation experience.

CHAPTER 7.0

RESPONSE TO COMMENTS
REGARDING DRAFT
ENVIRONMENTAL IMPACT STATEMENT
AND DESCRIPTION OF OTHER MODIFICATIONS TO DOCUMENT

STATE OF WASHINGTON

PUGET SOUND WATER QUALITY ACTION TEAM

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April 30, 2003

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RE: Draft Environmental Impact Statement for Watershed Planning Under Chapter 90.82 RCW

Dear Mr. White:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement
for Watershed Planning under Chapter 90.82 RCW (EIS). The Department of Ecology
has done an excellent job of developing a statewide document for review that will save
local governments and other stakeholders considerable time and expense as they adopt
1-1 their watershed plans.

Your cover letter indicates that one purpose of the EIS is to assist decision makers to identify key environmental issues and options. Comments numbered two and three below from Action Team staff offer several additional options and mitigation alternatives that are intended to improve information for local decision makers.

1. **Correction in Table 3-2 Selected Water Quality Laws, Regulations, and Programs**
On page 3-36 this table lists the Puget Sound Water Quality Protection Act (Chapter
1-2 90.71 RCW). The Provisions/Effect listed for this act should be amended to add that
the act adopts the state policy "...to implement the *Puget Sound Water Quality Management Plan* ..." and to consider for inclusion a recovery plan developed under the federal Endangered Species Act. In addition, the Puget Sound Action Team coordinates the Puget Sound Ambient Monitoring Program.

2. **Comprehensive stormwater management as a recommended alternative**
The *Puget Sound Water Quality Management Plan* calls on all local governments to
1-3 adopt a comprehensive stormwater management plan. The comprehensive
stormwater program was developed based on input from regional scientists and

experts in stormwater issues, including Ecology staff. It represents a comprehensive approach to managing surface water problems in all watersheds. Stormwater management can have a significant adverse impact on all aspects of watershed function, including groundwater recharge and quality, flooding, instream flows, habitat, and water and sediment quality.

The EIS includes a number of helpful alternatives regarding Growth Management Act plans and ordinances. Stormwater ordinances or specific stormwater measures are mentioned in the water quality alternatives (e.g. alternative WP 40, alternative WP 44), and there is a mention of limiting impervious surfaces in habitat alternative WP 49.1 under "groundwater." We suggest that the EIS supplement these alternatives with a programmatic solution that addresses stormwater impacts more fully and effectively.

Because land cover removal and urbanization have significant impacts on watershed hydrology and habitat, we suggest that the EIS incorporate recommendations in all sections for local governments to adopt comprehensive stormwater management programs as outlined in the *Puget Sound Water Quality Management Plan*, including land use regulations to promote low impact development. Solutions such as storage facilities, interbasin transfers, reclamation facilities, gray water systems, artificial recharge, regulation of water rights, and habitat restoration should be supported by local stormwater programs that preserve and restore natural hydrologic processes.

Draft language for such an alternative is suggested as:
Request local governments to adopt comprehensive stormwater management programs, including measures to promote low impact development practices so as to preserve and restore natural hydrologic processes in new development and re-development.

We recommend that this alternative be added to the section on water quantity, water quality, instream flows, and habitat. This alternative acknowledges the need to preserve natural hydrologic processes as development proceeds. It also recognizes the cost-effectiveness and environmental benefits of comprehensive stormwater management as a programmatic solution to multiple water resource problems. We recommend that this language also be applied to recommendations for mitigation of impacts in all four sections.

3. Alternatives more specific to protection of nearshore marine and estuarine habitat

1-4 We suggest that more specific references be made in the Habitat Alternatives section to impacts on, and mitigation measures related to, nearshore marine and estuarine habitat. Most of the language is related to freshwater habitat. We suggest that an alternative similar to WP 47 be added that refers specifically to nearshore marine habitat with suggested language below:

Implement habitat improvement projects involving bank stabilization and protection projects to restore marine shoreline littoral processes, marine shoreline riparian vegetation, and estuarine habitat in areas of important habitat for migrating salmon and spawning areas for surf smelt and sand lance.

This EIS will be beneficial for streamlining the adoption and implementation of
watershed plans, and will save local governments the time and cost that each would have
required for State Environmental Policy Act compliance. Under Ecology's leadership,
local watershed groups are developing watershed plans that will benefit Puget Sound and
watersheds statewide as they are implemented. Action Team staff continues to support
1-5 watershed planning efforts and looks forward to working with Ecology and other Action
Team agencies as plans are adopted and implemented in Puget Sound.

If you have questions regarding our comments, or would like to discuss them further, please contact Harriet Beale, the Action Team watershed planning lead at (360) 407-7307 or hbeale@psat.wa.gov. Thank you again for this opportunity to provide review and feedback on the document.

Sincerely,

Brad Ack
Chair

Letter 1 – Response to comments from Brad Ack, Puget Sound Water Quality Action Team

1-1 Comment acknowledged.

1-2 Comment acknowledged. The text of Table 3-3 (Table 3-2 in the draft environmental impact statement) has been modified accordingly.

1-3 As described in Section 5.1 of the environmental impact statement, the alternatives presented and evaluated in the document were developed based on input received through interviews and questionnaires from individuals directly involved in local watershed planning efforts. Ecology recognizes that watershed planning is a locally driven process and believes it would be inappropriate for the department to propose alternatives (recommended actions) as that might unduly influence local decision making processes. As you point out, there are a number of alternatives that address stormwater measures or ordinances; however, there were no alternatives identified during the alternatives development process that were similar to that proposed in your comment. While Ecology is in agreement that adoption of comprehensive stormwater management plans and programs would have positive impacts on the health of affected watersheds, to remain consistent with the aforementioned alternatives development process, the proposed alternative will not be included.

1-4 Comment acknowledged. Since the proposed alternative is quite similar to Alternative WP27, the narrative for that alternative in Section 5.5.2 will be expanded accordingly.

1-5 Comment acknowledged. Thank you for your comments.

STATE OF WASHINGTON
OFFICE OF COMMUNITY DEVELOPMENT
906 Columbia St. SW • PO Box 48350 • Olympia, Washington 98504-8350 • (360) 725-2800

May 8, 2003

Mr. Gordon White, Manager
Shorelands and Environmental Assistance Program
Washington State Department of Ecology
Post Office Box 47600
Olympia, Washington 98504-7600

RE: Draft Environmental Impact Statement for Watershed Planning Under Chapter 90.82 RCW

Dear Mr. White:

2-1 Thank you for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for Watershed Planning under Chapter 90.82 RCW. This programmatic EIS will be a useful tool for watershed planning groups and local governments to refer to when designing the local watershed plans.

2-2 The Department of Community, Trade and Economic Development (CTED) has worked with Ecology on developing guidance to local governments through the publication, *Guide to Watershed Planning and Management,* and its *Addendum #1*. In these documents the linkages between local planning under the GMA and watershed planning is well documented. We recommend that you refer to the Addendum #1 on this topic when documenting the relationship with growth management planning and watershed planning efforts.

2-3 The EIS description and purpose acknowledges the different elements, or components of watershed planning, including managing for water quantity, quality, habitat (fish and wildlife), and instream flow regimes. In most instances, local governments are already addressing these water related elements through Growth Management Act (GMA) work on designating and conserving resource lands (forests, agriculture, mineral lands), critical areas designation and protection, shoreline management planning and permitting, and land use zoning designations.

In addition, functional plans, such as approved sewer plans (Chapter 36.94.040 RCW) and water system plans (Chapter 57.16.010 RCW) enable a local government to address service area and funding issues for infrastructure capacity planning and maintenance of sewer and water systems. Relying on the planning, permitting, and capital facilities funding framework under the GMA provides an important and consistent approach for local governments watershed planning needs. Following are suggestions on how to make these linkages in your EIS:

2-4

- On page 3-37, Table 3-2 (Selected Water Quality Laws, Regulations and Programs) the following information should be added:

Law, Regulation, Program	*Provisions/Effect*
Sewerage, Water, and Drainage Systems (Chapter 36.94.040 RCW)	**(Add to the existing statement)** The sewerage and/or water general plan must incorporate the provisions of existing comprehensive plans (under the Growth Management Act, Chapter 36.70A RCW) relating to sewerage and water systems of cities, towns, municipalities, and private utilities to the extent they have been implemented.
General comprehensive plan of water system improvements - approval of engineer, Director of Health, and city, town, or county - amendments (Chapter 57.16.010 RCW)	The statute requires, for the purpose of determining the present and reasonable foreseeable future needs, shall examine and investigate and select a water supply or water supplies for each district suitable and adequate for present and future needs and shall consider and determine a general system or plan for acquiring such water supply or water supplies, and the lands, waters, and water rights and easements necessary.
Evidence of water availability for building permit application (Chapter RCW 19.27.097)	This statute states "each applicant for a building permit of a building necessitating potable water shall provide evidence of an adequate water supply for the intended use of the building."
Approval or disapproval of subdivision (Chapter 58.17.110 RCW)	This statute provides the factors to be considered when approving or disapproving subdivisions. It states, "It [the legislative body] shall determine (a) if appropriate provisions are made for, but not limited to, the public health, safety, and general welfare, for open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes…"

2-5

- The table on page 3-71 (titled 3.5.6 Other Laws, Regulations, and Programs Affecting Land and Shoreline Use) provides a cursory summary of the GMA that should be changed to reflect more accurately the effect of the GMA to watershed planning. The recommended changes include:

	Law, Regulation, Program	*Provisions/Effect*
	Growth Management Act (Chapter 36.70A RCW)	The Growth Management Act (GMA) was enacted in 1990 and establishes 14 planning goals to provide a planning and permitting framework for local government fully planning in Washington State (95% of the state's population). Comprehensive plans and development regulations (critical areas regulations, zoning, clearing and grading, etc.) must be adopted that are consistent with the planning goals. All counties and cities must designate and protect critical areas, as defined in Chapter 36.70A.060 RCW.
2-6	Procedural Criteria for Adopting Comprehensive Plans and Development Regulations (Chapter 365-195 WAC)	Chapter 365-195 WAC was adopted by the Department of Community, Trade and Economic Development (CTED) to guide local governments in the development and adoption of comprehensive plans and critical area development regulations.
2-7	Best Available Science Rule (Chapter 365-195-900 WAC)	Chapter 365-195-900 through 925 WAC provides guidance on how local governments include the "best available science" when they designate and protect critical areas (wetlands, fish and wildlife conservation areas, frequently flooded areas, critical aquifer recharge areas, and geologically unstable areas.) The rule also provides criteria for determining what constitutes the best available science.
2-8	Land Use Element of a Comprehensive Plan (Chapter 36.70A. 070 (1) RCW)	Chapter 365-195-305 WAC provides guidance on developing the Land Use Element that includes a "provision for protection of the quality and quantity of ground water used for public water supplies". Where applicable, local governments should perform a review of drainage, flooding, and storm water run-off in the area covered by the plan and nearby jurisdictions, and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state, including Puget Sound or waters entering Puget Sound. Land Use Elements often contain the environmental policies and critical areas protection policies.
	Capital Facilities Element of a Comprehensive Plan (Chapter 36.70A.070(3) RCW)	Chapter 365-195-315, WAC provides guidance on creating an inventory of existing capital facilities (e.g. sewer, transportation, water facilities, etc.) owned by public entities, showing the locations and capacities of the capital facilities. Local governments should include a

		forecast of the future needs for such capital facilities and the proposed locations and capacities of expanded or new capital facilities. They also should develop at least a six-year plan that will finance such capital facilities within projected funding capacities and clearly identifies sources of public money for such purposes. A requirement to reassess the Land Use Element if probable funding falls short of meeting existing needs and to ensure that the Land Use Element, Capital Faculties Plan Element and financing plan are coordinated and consistent.
	Utility Element of the Comprehensive Plan (Chapter 36.70A.070 (4) RCW)	Chapter 365-195-320, WAC contains provisions directing this element to contain the general location, proposed location, and capacity of all existing and proposed utilities (water, sewer, stormwater, etc.).
	Rural Element of the Comprehensive Plan (Chapter 36.70A.070 (5) RCW)	Chapter 365-195-330, WAC states that counties shall include lands that are not designated for urban growth, agriculture, forest, or mineral resources. The Rural Element shall permit land uses that are compatible with the rural character of such lands and provide a variety of rural densities, including a recommendation for meeting the requirement by establishing criteria for environmental protection, including programs to control non-point sources of water pollution and to preserve and enhance habitat for fish and wildlife.
2-9	Minimum Guidelines to Classify Resource Lands and Critical Areas (Chapter 365-190 WAC)	Chapter 365-190 was adopted by CTED to assist local governments in classifying natural resource lands and critical areas. The guidelines contain specific criteria for designating and protecting critical areas functions and values and are to be used by all local governments in formulating development regulations.
2-10	Local Project Review (Chapter 36.70B RCW)	Chapter 36.70B RCW was enacted by the Legislature to establish a mechanism for early determination of the consistency of proposed projects with comprehensive plans and development regulations adopted under the GMA. The integrated project review process established under this statute directs local governments to consider early environmental analyses and mitigation measures that may be integral when making permit decisions requiring threshold determinations under the State Environmental Policy Act (Chapter 43.21C RCW) and permit decisions.

2-11

Project Consistency Rule (Chapter 365-197 WAC)	Chapter 365-197-010 WAC was adopted by CTED to provide criteria to assist local governments planning under the GMA to analyze the consistency of project actions under four factors: 1) the type of land use allowed; 2) the level of development allowed, such as dwelling units per acre or other measures of intensity; 3) adequate infrastructure for the proposed project; and 4) characteristics of the proposed development and assessment for compliance with specific development regulations or standards.

- On page 3-66, after the Utilities Element discussion, there should be a paragraph describing the "Rural Element". Suggested language could be:

2-12 For counties planning under the GMA, they shall identify and include lands that are not designated for urban growth, agriculture, forest, or mineral resources and designate these as "rural lands". The **Rural Element** shall permit land uses that are compatible with the rural character of such lands and provide a variety of rural densities, including a recommendation for meeting the requirement by establishing criteria for environmental protection, including programs to control non-point sources of water pollution and to preserve and enhance habitat for fish and wildlife.

2-13 Thank you for this opportunity to review and comment on this important document. Once finalized, this programmatic EIS will save local government much time and will help to streamline the adoption and effective implementation of watershed plans. If you have questions about our comments or would like to discuss them further, please contact me at 360/ 725-3058 or chrisp@cted.wa.gov.

Sincerely,

Chris Parsons

Chris Parsons, AICP
Senior Planner
Growth Management Services

cc: Leonard Bauer, Managing Director, CTED
Heather Ballash, Policy Advisor, CTED
Derek I. Sandison, Department of Ecology

Letter 2 – Response to comments from Chris Parsons, State of Washington Office of Community Development

2-1 Comment acknowledged.

2-2 Comment acknowledged. A discussion of the *Guide to Watershed Planning and Management* and its *Addendum #1* has been added to the introductory portion of Section 3.5. These documents were also incorporated by reference.

2-3 Comment acknowledged.

2-4 Comment acknowledged. A new subsection has been added to Table 3-5 that incorporates the identified functional plans and related RCWs.

2-5 The table did not include a cursory summary of the Growth Management Act, but rather, a summary of Chapter 365-195 WAC. The full title of that WAC is "Growth Management Act – Procedural Criteria for Adopting Comprehensive Plans and Development Regulations." Chapter 36.70A WAC, the Growth Management Act, is discussed in Section 3.5.4. To avoid confusion, the reference to the Growth Management Act in the title of the WAC has been removed from Table 3-5.

2-6 Chapter 365-195 WAC is already summarized in Table 3-5.

2-7 The "Provisions/Effect" discussion for best available science has been incorporated into the summary of Chapter 365-195 WAC in Table 3-5.

2-8 A summary of comprehensive plan elements is already provided in Section 3.5.4. Minor modifications have been made to the Rural Element discussion in Section 3.5.4 based on this comment.

2-9 A summary of Chapter 365-190 WAC is already provided in Table 3.5.

2-10 A summary of Chapter 36.70B RCW is already provided in Table 3.5.

2-11 A summary of the Chapter 365-197, the Project Consistency Rule, has been added to Table 3-5.

2-12 See response to Comment 2-8.

2-13 Comment acknowledged. Thank you for your comments.

STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N – Olympia, Washington 98501-1091 – (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building – 1111 Washington Street SE – Olympia, WA

May 9, 2003

Washington Department of Ecology
Attention: Derek L. Sandison
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, Washington 98902

Dear Mr. Sandison:

RE: WATERSHED PLANNING UNDER CHAPTER 90.82 RCW DRAFT ENVIRONMENTAL IMPACT STATEMENT

3-1

Thank you for the opportunity to comment on the Washington Department of Ecology's (Ecology) Draft Environmental Impact Statement (DEIS) for Watershed Planning under Chapter 90.82 RCW. The Washington Department of Fish and Wildlife (WDFW) staff have reviewed the DEIS and are providing the following comments.

Overall, WDFW feels the Draft EIS is good. A large number of alternatives (WP #) cover a range of options that should be considered by watershed planning units. There are numerous grammatical and typographic errors. The department's comments are focused on substance issues.

3-2 Throughout the document, the terms "instream flow" and "stream flow" appear to be used interchangeably. Instream flow is a regulation or requirement, but stream flow is what is actually flowing.

Chapter 1: Description of Proposal and Background

1.5 Description of Watershed Planning Process:

3-3 Page 1-3. First sentence after bullets. "The aforementioned entities must invite all tribes with reservation lands within the WRIA to participate as initiating governments." Although this accurately reflects the language in statute, it might lead to exclusion (or failure to include) tribes whose "usual and accustomed" fishing areas are within the WRIA. On the next page this issue is addressed.

3-4 Page 1-4. Last sentence. Change to read, "…and responsibilities in supporting watershed planning <u>and salmon recovery at the local level</u>." The MOU referenced deals with both watershed planning and salmon recovery and the need to coordinate responses to the two. Also, a citation should be included to this MOU in the references at the end of Chapter 1.

1.9 Environmental Impact Statement Scoping:

3-5 Page 1-19. In stream flows. In addition to the impacts listed in the EIS to the environment, economic impacts to other users would undoubtedly occur. Future users such as agriculture or residential development moving into an area after instream flows are set would receive a later priority date for their water rights and could thus be affected economically. Would an economic impact statement be required for each individual watershed plan?

3-6 Pages 1-19 – 1-21. In addition to the issues identified for discussion relating to the Instream Flow Component and the Habitat Component, it is important to address the geomorphological processes that shape the channel. Without consideration of this issue, discussions of all other instream flow and habitat issues will be inaccurate. The frequency, duration, timing, and magnitude of floods interact with watershed geology (soils and topography), and this interaction is strongly influenced by land use within the watershed. Timing of different flows will also affect fish behavior and survival.

Chapter 2.0 State Environmental Policy Act and National Environmental Policy Act Compliance for Watershed Plans

3-7 Page 2-1. The title may be misleading since it refers to both the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA). Watershed plans under Chapter 90.82 RCW are state-implemented provisions, not national. While there are permits and approvals that may need to be obtained from federal agencies, compliance for watershed plans as they relate to the Watershed Planning Act is a state-driven compliance issue. You might want to change this to read, "Compliance with Watershed Planning and the Relationship to the State Environmental Policy Act and National Environmental Policy Act."

3-8 Page 2-4 – 2-5. Since the Watershed Planning Draft EIS does not contain site-specific information, it is questionable as to how the analysis in this document could be adopted to "meet...<u>all</u> of its responsibility to prepare an Environmental Impact Statement or other environmental document". It could, however, be used in part, as a broad analysis of "general" impacts and alternatives. The concern the department has is that each area that undergoes watershed planning may be unique, with its own set of problems. The public and other agencies would expect to be able to make sure that those unique characteristics are recognized and documented as needing additional mitigation for actions taken by watershed planning units. In addition, some watershed planning may impact other environmental issues (i.e., wildlife species or recreational impacts). An adoption of this EIS in full to suffice for the fulfillment of future SEPA documents would prevent analysis of those impacts.
3-9 Issuing a DS and adopting this EIS or issuing a DS and adopting this EIS with an addendum would result in a no comment period.

3-10 Page 2-6. Bullet beginning, "An Adoption and Determination of Non-Significance (DNS)..." It is suggested the following be added at the end of the paragraph, "Comments may change the threshold determination or require issuance of a revised DNS."

Page 2-8. Determine the level of NEPA compliance required:

3-11 The paragraph appears to indicate that the proponent makes the level of NEPA compliance that is appropriate. Actually, that decision is the federal agency's decision, although they may discuss their decisions with the proponent.

3-12 Page 2-9. First paragraph. " If the environmental assessment indicates that the project will have no significant environmental impacts, a finding of no significant impact (FONSI) is prepared. We suggest you add, "is prepared by the federal agency".

Chapter 3.0 Laws, Regulations, and Programs Related to Watershed Planning Under 90.82 RCW

3-13 The document should make it clear that laws, regulations and programs may change depending on future legislation and that the laws and regulations noted in this EIS are based on present laws and regulations.

3.1.6 How Chapter 90.54 RCW, Chapter 90.03 RCW, Chapter 90.44 RCW, Chapter 90.14 RCW, and Chapter 90.80 RCW function together in Water Right Permitting and Relinquishment:

3-14 Pages 3-8 – 3-14 – There is no mention in the text of RCW 77.55.050, but it is discussed in Table 3-1 under "Additional State Laws, Regulations, and Programs Related to Water Rights" on Page 3-13.

3.2 Instream Flow:

3-15 Page 3-13. Table 3-1. The Washington Water Acquisition Program is listed. We suggest also adding the "Work Plan for Instream Flow Setting Through 2010" and its description; including that it is intended to both accommodate and complement watershed planning. Both programs represent Ecology and WDFW cooperation. Also, please add a citation to the 2010 Plan in the references section at the end of the chapter

3-16 Page 3-15. The link for A Guide to Instream Flow Setting in Washington State needs ".html" added at the end so that it will work.

3.2.3 Construction Projects in State Waters (Chapter 77.55 RCW):

3-17 Page 3-16. The citation (multiple) should be corrected from 77.55.040 to 77.55.050. The reader
3-18 is referred to Table 3-1, which refers the reader back to this section, where the discussion is inadequate. It also refers to 3.4.9.1, which discusses other parts of RCW 77.55, but does not discuss 77.55.050, which is a major consideration in instream flows and the oldest Washington statute explicitly discussing instream flow.

3.4 Habitat

3-19 Page 3-43. The pagination needs to be fixed so that it will not be construed as the end of one chapter and the beginning of another.

3-20 Page 3-52. Last Paragraph, 3rd line. It is more correct to say, "An HPA, containing any conditions…issued in writing within 30 days…"

3-21 Page 3-53. First line. We suggest adding, "…on fish, shellfish, or their habitat which cannot be fully mitigated the HPA may be denied…" That same paragraph states that HPAs "can be appealed to the state Hydraulic Appeals Board." It should read, "…can be appealed to an Administrative Law Judge or to the Hydraulic Appeals Board depending on the statute, or WAC, the denial was issued under.

3-22 Page 3-54. Last Paragraph. The sentence that begins with, "However, local governments…" should indicate that WDFW also must agree that the project meets the requirements of RCW 77.55.290.

Chapter 4 Affected Environment

4.3 Surface Water
4.3.1 Freshwater – Rivers and Streams:

3-23 Page 4-3 (1st paragraph, line 2). Change "southeastern" to "southwestern".

3-24 Page 4-4. Glacial streams and their hydrology, as distinct from snowmelt hydrology, should be presented.

4.6 Fish and Wildlife
4.6.1 General Description:

3-25 Page 4-10 – Fish. The listing would be more useful if it distinguished native freshwater species from introduced freshwater fishes (catfish, sunfish, perches) and marine fishes (herring, rockfish, greenlings, sand lance, and flounder).

3-26 The last paragraph in this section states that the definition of "salmonid" in this document is consistent with the definition used in the Statewide Strategy to Recover Salmon. This is true, in part, but incomplete as the definition in the salmon strategy also includes whitefish and grayling. Please correct as appropriate.

4.6.2. Salmonids:

3-27 Page 4-10. Sec 4.6.2.1. Resident Trout Species. The discussion under the heading, "trout," refers to both trout and char. We also have populations of resident or landlocked salmon in the state, as well. Change the heading "Resident Trout Species" to "Resident Salmonids."

3-28 1st paragraph, last sent. Change to read, "Such declines can be attributed to a number of factors, including..."

3-29 Page 4-11. –Bull Trout. Bull trout can be anadromous, particularly in Puget Sound and coastal streams.

4.6.2.2 Anadromous Salmonids:

3-30 Page 4-12. As mentioned above, bull trout can be anadromous. They are in the genus *Salvelinus*, not *Oncorhynchus*.

3-31 Page 4-13 – Coho Salmon. The long freshwater rearing period makes coho dependent on flow and freshwater habitat. Work by Dave Seiler (WDFW) has shown that higher summer flow results in higher production of coho salmon. See also: chum.

3-32 – Chum Salmon. The text is misleading by stating that chum salmon "are the last of the salmon to return each fall." Coho are often later and summer chum are earlier.

3-33 Page 4-14 – Pink salmon. Pink salmon spawn in odd years, not even years, with a few Washington exceptions. Farther north, even year runs become more prominent.

3-34 – Steelhead. Steelhead rear for 2 years in streams before migrating to sea. Consequently, they are very dependent on flows and freshwater habitat.

3-35 – Sea-run Cutthroat Trout. Like steelhead, sea-run cutthroat trout rear for 2 years in freshwater and are dependent on flow and habitat.

Section 4.6.3. Other Fish:

3-36 Page 4-18. We suggest you add for clarification at the end of the paragraph, "In addition, native and non-native species, such as white sturgeon, eulachon, longfin smelt, Pacific lamprey, and American shad are anadromous.

4.10. Recreation:

3-37 Page 4-27. 1st paragraph, 2nd sentence. We suggest you add, "…waterfowl watching, <u>hunting</u>, fishing, and <u>other</u> water activities."

Chapter 5.0 Alternatives

5.3 Instream Flow Alternatives:

3-38 Page 5-10. There is no discussion of Closure of Basins. This seems to be in a different category than "Set instream flows" and it should be clearly identified as an alternative or included within Alternative WP 26. If it is discussed elsewhere, such as in Quantity, it should be referenced to that section since it relates to instream flow impacts.
5.3.2 Take No Action:

3-39 Page 5-11. Another alternative under the "no action" alternative might be acknowledged, that is, other resource agencies may recommend to Ecology that instream flows need to be set for a basin.

5.4.2 Improve Nonpoint Source Pollution Control:

3-40 Page 5-13. Alternative WP 32. The bulleted options may be clearer if they were 32a, 32b, 33c.

5.5 Habitat Alternatives:

3-41 Page 5-16. 1st paragraph. Reference is made to a number of existing laws, rules and ordinances. You should include RCW 77.55 (77.55.040 Fish guards required on diversion devises-Penalties, remedies for failure and 77.55.060 Fishways required in dams, obstructions-Penalties, remedies for failure). These two RCWs require habitat improvements for fish passage.

3-42 One possible general category of potential recommended actions might be termed Management Actions or Management Structure. This would include forming an umbrella organization watershed-wide to coordinate and manage all enhancement actions. This should be included in addition to the 5 bullets.

3-43 Page 5-17. Alternative WP 45. We suggest you add, "...agencies to remove dams, or other human-made structures or replace bridges..."

Chapter 6. Impacts and Mitigation Measures

Water Quantity Alternatives (Impacts):

6.19 Alternative WP 19: Construct and operate new on-channel storage facilities:

3-44 Page 6-73. – Surface Water. *Long-term/operational impacts.* No discussion of impacts to lateral relationships, from upland to surface water (interstitial and surface to surface), has been included. These natural relationships function to moderate precipitation and microclimate.

3-45 Pages 6-75 – 6-76 and Page 6-80. – Wildlife. The change in longitudinal connectivity and modification of hydrology resulting from in-channel storage facilities will have much greater impacts to the watershed than the impacts enumerated here.

3-46 Page 6-80. While you discuss impacts from introduced non-native [fish] species, no discussion is made toward native species such as northern pikeminnow which prefer slower water as would be present at a reservoir, and which prey heavily on anadromous juvenile species.

6.20 Alternative WP 20: Raise and continue to operate existing on-channel storage facilities:

3-47 Pages 6-84 - 6-89. The same types of issues occur as in Alternative WP 19 - Wildlife. We suggest that you more fully discuss impacts from on-channel storage in reference to longitudinal connectivity and modification of hydrology (in both Alt. 19 and 20), including, but not limited to, disruption of structural diversity (i.e., sloughs, braided and wall-base channels), the disruption of lateral relationships (i.e., nutrient input and food chain creation), channel sinuosity impacts and removal of cyclic patterns of free-flowing streams that contribute to streambank (both soils as well as vegetation) and streambed health (i.e., sediment removal from gravels, LWD accumulation, pool creation). Any potential changes in water regime due to impoundment also disrupts migratory behavior of juvenile salmonids and inhibits the establishment of aquatic macrophytes that provide cover for aquatic species.

3-48 Pages 6-90 – 6-113. In Alternatives WP 21, 22, 23, and 24, the connectivity issue (See comments for Alternative WP 19 and 20) is not as dramatic, but consequences of changing flow timing and magnitude will have to be considered.

Instream Flow Alternatives (Impacts):

6.26 Alternative WP 26. Request Ecology to set instream flows for protection and/or restoration by administrative rule:

3-49 Page 6-118. Groundwater. There should be a more enlarged discussion of the impact of establishment of minimum instream flows on groundwater, in that exempt wells are being examined in a number of basins for potential restriction.

3-50 Page 6-119. – Wildlife. The discussion is good as far as it goes, but it implies that the various tools in IFIM are adequate to assess long-term impacts of instream flows. If the full collection of tools and concepts in IFIM, including consideration of connectivity, geomorphological processes and how they are affected by instream flows, and other biological considerations, are employed, then IFIM can be a useful tool to assess long-term impacts of instream flows. If only PHABSIM and time-series are used, then assessment will be misleading and inaccurate.

3-51 – Land and Shoreline Use. Same comment as above under "Groundwater". Future users such as agriculture or residential development moving into an area after instream flows are set would receive a later priority date for their water rights and could thus be affected economically.
3-52 Would an economic impact statement be required for each individual watershed plan?
3-53 Also, if exempt wells are not restricted but surface water flows are, this would potentially affect the type of development in an area (larger lots, more rural?), since counties do not regulate exempt wells but they do regulate residential plat development and community water supply.

Habitat Alternatives (Impacts):

6.42. Alternative WP42. Implement habitat improvement projects involving construction…:

3-54 Page 6-154. *Long-term/operational impacts.* 1st paragraph. Change the second sentence to read: "Although only limited monitoring has occurred, many projects that have been undertaken in the past likely have not had ~~any~~ a significant positive effect."

3-55 Page 6-153 – 6-158. – Wildlife. Long-term/operational benefits for fish and wildlife will be successful only if landscape scale processes (fluvial geomorphology, soil-water interactions, vegetation-water-soil interactions) are considered and accommodated.

6.44. Alternative WP 44. Request local government to route treated stormwater to water limited streams to allow for channel maintenence:

3-56 Page 6-164 – 6-172. The discussion of long-term/operational benefits for fish and wildlife needs to consider hydrology and water quality of input water as well as receiving water. If input magnitude changes timing of flows (shape of hydrograph), there could be consequences for fish and wildlife.

6.46. Alternative WP 46 Support construction of fish passage facilities where such facilities do not currently exist:

3-57 Page 6-174. Land and shoreline use. *Long-term/operational impacts.* Delete the second sentence under this sub-heading. This statement of potential landowner 'take' liability where ESA species regain lost access is speculative, argumentative and an unnecessary 'red flag.' One could just as easily argue for an ESA liability statement for the "no-action" section (Page 6-205) to the extent that not removing a barrier exposes both the state and those responsible for the barrier to take liability, as well. It is not necessary to add this potentially misleading information for the purposes of this document.

3-58 In general, the Draft EIS for Watershed Planning has been cohesive and, for the most part, comprehensive in its analysis. If you have any questions concerning these comments, you may contact me at (360) 902-2575.

Sincerely,

Cynthia R. Pratt

Cynthia R. Pratt
WDFW Responsible Official
Habitat Program

cc: Hal Beecher, WDFW
Carl Samuelson, WDFW
Terra Hegy, WDFW
Pat Chapman, WDFW
Teresa Scott, WDFW
Gayle Kreitman, WDFW
Steve Penland, WDFW
Gordon White, Ecology

Letter 3 – Response to comments from Cynthia R. Pratt, State of Washington Department of Fish and Wildlife

3-1 Comment acknowledged.

3-2 The distinction between the two terms is understood. A word search was conducted of the document to ensure that the terms were used appropriately.

3-3 The discussion on page 1-3 reflects the provisions of Chapter 90.82 RCW. The statutory requirement for inviting tribes to participate as an initiating government is limited to tribes with reservation lands within an affected Water Resources Inventory Area. As noted on the subsequent page, other tribes may be invited to participate in the watershed planning process in the capacity of planning unit members.

3-4 Comment acknowledged. The text of Section 1.5.1 has been modified accordingly.

3-5 Section 1.9 is a recitation of issues identified through the environmental impact statement scoping process that occurred in early 2002. The impacts associated with setting or not setting instream flows are described in Sections 6.26 and 6.27. It is possible that rules developed in accordance with provisions of an approved watershed plan could trigger the need for a small business economic impact statement if it imposes more than minor costs on a business within a given industry. However, RCW 90.82.080 (ii) (b) specifically exempts rules adopted for purposes of setting instream flows under provisions of the Watershed Planning Act from requirements for preparation of a small business economic impact statement.

3-6 See response to comment 3-5. Channel forming processes are discussed in the context of a number of alternatives in Chapters 5.0 and 6.0.

3-7 While it is correct that watershed plans in their entirety would not trigger National Environmental Policy Act (NEPA) compliance, components of a watershed plan could. Federal agencies are participating in a number of planning units and such agencies may be requested, as a component of a watershed plan, to undertake certain actions. Depending on the nature of those requested actions, compliance with the provisions of NEPA may be triggered.

3-8 WAC 197-11-600 states that:

> An agency may use environmental documents that have been previously prepared in order to evaluate proposed actions, alternatives, or environmental impacts. The proposal may be the same as, or <u>different than</u>, those analyzed in the existing documents. . . . Existing documents may be used for a proposal by employing . . . "adoption," where an agency may use part or all of an existing environmental document to meet its responsibilities under SEPA. [emphasis added]

According to WAC 197-11-443, a nonproject proposal may be approved based on an environmental impact statement assessing its broad impacts. When a county legislative authority considers approval of an individual watershed plan, the SEPA lead agency will make a determination regarding the adequacy of the statewide watershed planning environmental impact statement in meeting its environmental review standards and needs for the proposal. As noted in Section 2.2, the SEPA lead agency may determine that the statewide document is adequate for their needs, or determine that an addendum or supplemental environmental impact statement is needed.

In addition, it should be noted that watershed plans typically contain a series of recommended actions that consist of both project and nonproject actions. Some of these actions will require permitting and further environmental analysis at the time they are implemented. Per provisions of WAC 197-11-443, when a project or nonproject action that is consistent with the approved watershed plan is implemented, the environmental impact statement for such an action would focus on the impacts and alternatives including mitigation measures specific to the subsequent project and not analyzed in the nonproject EIS.

3-9 Section 2.2 correctly states that there is a seven day waiting period after a DS and adoption or a DS, adoption, and addendum before an action can be taken.

3-10 Due to the size of the document, some judgments were made concerning the appropriate level of detail to be provided in the text. The purpose of citing the appropriate Washington Administrative Code in the referenced portion of the text was to provide the reader a source of more detailed information regarding the DNS process such as that described in the comment.

3-11 Comment acknowledged. The text of Section 2.3.2 has been modified accordingly. The intent was to suggest a collaborative process between the planning unit and the federal agency; however, as written, the text was incorrect.

3-12 Comment acknowledged. The text of Section 2.3.2 has been modified accordingly.

3-13 Comment acknowledged. The introduction to Chapter 3.0 has been modified accordingly.

3-14 Chapter 77.55 RCW contains provisions that are applicable to three of the four components of watershed planning: water quantity, instream flow, and habitat. Thus, provisions of that code that are relevant to the three watershed planning components are presented in Sections 3.1, 3.2, and 3.4.

3-15 Comment acknowledged. A new subsection, Section 3.2.7, has been created to describe the *Work Plan for Instream Flow Setting* and the document has been cited in the references.

3-16 Comment acknowledged. The introduction to Section 3.2 has been modified accordingly.

3-17 Comment acknowledged. The text of Section 3.2.3 has been modified accordingly.

3-18 See response to comment 3-14. All provisions of RCW 77.55.050 relevant to instream flow are discussed in Table 3-1 and Section 3.2.3.

3-19 Comment acknowledged. The formatting error at the end of Section 3.4.2 has been corrected.

3-20 Comment acknowledged. The text of Section 3.4.9.1 has been modified accordingly.

3-21 Comment acknowledged. The text of Section 3.4.9.1 has been modified accordingly.

3-22 Comment acknowledged. The text of Section 3.4.9.1 has been modified accordingly.

3-23 Comment acknowledged. The text of Section 4.3.1 has been modified accordingly.

3-24 Comment acknowledged. The text of Section 4.3.1 has been modified accordingly.

3-25 Comment acknowledged. The information source was a Washington Department of Fish and Wildlife Document that did not differentiate between native and introduced species.

3-26 Comment acknowledged. Section 4.6.1 has been modified to include a reference to whitefish and grayling.

3-27 Comment acknowledged. The heading for Section 4.6.2.1 has been realigned.

3-28 Comment acknowledged. The text of Section 4.6.2.1 has been modified accordingly.

3-29 There is reference made to the fact that some bull trout migrate to salt water bodies in Section 4.6.2.1. Additional discussion regarding anadromous bull trout has been placed in Section 4.6.2.2.

3-30 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-31 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-32 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-33 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-34 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-35 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

3-36 Comment acknowledged. The text of Section 4.6.3.1 has been modified accordingly.

3-37 Comment acknowledged. The text of Section 4.10 has been modified accordingly.

3-38 Alternative WP11 addresses closure or partial closure of a basin or subbasin.

3-39 This environmental impact statement is specific to watershed planning conducted under the provisions of Chapter 90.82 RCW. Ecology and the Department of Fish and Wildlife have developed a guidance document that addresses provisions for recommending and setting instream flows outside of the scope of Chapter 90.82 RCW.

3-40 Comment acknowledged; however, assigning 32a, 32b, and 32c would likely cause the reader view the options as alternatives within the alternative, which they are not.

3-41 The list of existing laws, rules, and ordinances in the introduction to Section 5.5 was taken directly from Chapter 90.82 RCW. The RCW did not make reference to Chapter 77.55 in this context. A notation has been made in the introduction to Section 5.5 that the list is not exhaustive.

3-42 As noted in Section 5.1, the alternatives evaluated in this environmental impact statement were developed based on input from local planning groups. Ecology avoided proposing alternatives on its own as such an action might be construed as attempting to guide or direct local planning process. However, the concept of developing a local management entity to help implement watershed plans was a topic addressed by the Phase Four committee and is briefly discussed in Section 1.5.4.

3-43 See response to comment 3-42. While the term "other infrastructure" used in the alternative could easily be construed to include "dams or other human-made structures," no specific reference to dams was made by local planning groups when Ecology received input on alternatives to be included in the environmental impact statement.

3-44 The second sentence is unclear. The natural subsurface flow relationships do not function to moderate precipitation and microclimate, rather they function to moderate how the watershed responds to inputs of precipitation and the influence of microclimates. Text has been added to Section 6.19.1 (Surface Water) regarding the alteration of subsurface flow paths and surface routing associated with creating an on-channel impoundment.

3-45 Comment acknowledged. Discussion has been added to Sections 6.19.1 and 6.19.2 (Wildlife) to describe potential downstream effects on fish populations from dams built in non-fish bearing waters.

3-46 Comment acknowledged. Text has been added to Section 6.19.1 (Wildlife) to describe the potential that an increased area of slow-moving water may result in an increase in the numbers of native species (such as pikeminnow) that compete with or are predators of salmonids.

3-47 Comment acknowledged. Additional text has been added to Sections 6.19.1 and 6.19.2 (Wildlife) to incorporate the above impacts. No changes were made to Section 6.20

because it states that the “long-term impacts to wildlife are predicted to be similar to those described in Section 6.19.1.” Similarly, Section 6.20.2 refers to Section 6.19.2 for a description of mitigation measures.

3-48 Comment acknowledged. Additional text has been added to 6.19.1 and a statement has been placed in Sections 6.21.1 and 6.22.1 that impacts would be similar to, but of lesser magnitude than, those described in Section 6.19.1.

3-49 Comment acknowledged. The text of Section 6.26.1 (Ground Water) has been expanded.

3-50 Comment acknowledged. The text of Section 6.26.1 (Wildlife) has been expanded to provide a more comprehensive discussion of analysis techniques.

3-51 As a practical matter, in most WRIAs new water rights are not being issued and the need for “new” water is primarily being satisfied through changes of existing rights (e.g., purchases of rights and transfers) or through water use efficiency measures.

3-52 See response to comment 3-5.

3-53 The evaluation of impacts for Alternative WP 26 acknowledges that in some cases, the nature of development may be altered by lack of water availability and land use plans may need to be modified.

3-54 Comment acknowledged. The text of Section 6.42.1 (Wildlife) has been modified accordingly.

3-55 Comment acknowledged. The text of Section 6.42.1 has been modified accordingly.

3-56 The effects of input water quality are already addressed in Section 6.44.1 (Surface Water). However, text has been added to that section to discuss the potential impacts of a change in hydrologic regime due to the routing of treated stormwater to water limited streams. Also, additional text was added to Section 6.44.1 (Wildlife) to reflect the potential for significant changes to channel morphology and fish habitat.

3-57 No change has been made to this section. It is important to differentiate between "take" in terms of harm, harass, or kill, and the loose interpretation of "take" that includes modification of habitat (regarding which the courts are still unclear). In the first case, should an endangered population be reintroduced into old habitat, the potential for physically harming or killing a fish through land use actions (such as entrainment in an irrigation intake) is an issue that many landowners are concerned about. Physical harm is very clearly a "take" under ESA. In the case of a migration barrier that is not removed (the no action alternative), the connection to ESA is not as clear since no fish are physically harmed. Hence, we believe there is nothing speculative about the current language in the document.

3-58 Comment acknowledged. Thank you for your comments.

WA Department of Ecology, Water Resources Division
Watershed Planning DEIS Review
Chapters 3-6

Chapter 3

4-1
1. Section 3.1.1 Water Resources Act of 1971 (90.54 RCW): Suggest editing the first sentence in this section to read: The Water Resources Act of 1971 outlines the guiding principles for water resource management in Washington State. It seems difficult to claim that it provides for the principles of much of the body of water resource policy and law when RCW 90.54 post-dates the surface & ground water codes, however it does outline some of the guiding principles of broader water management.

4-2
2. Section 3.1.2 Water Code (RCW 90.03): Suggest discussing riparian rights before describing surface water code and mentioning that the water code recognizes riparian rights. Potential wording could be: There are riparian water rights in Washington, though it is primarily a prior appropriation doctrine state. In general, riparian rights can be held by landowners abutting the water body while prior appropriation rights are based on a seniority date – *i.e*. when the water right was issued.

4-3
3. Section 3.1.6.1 Permitting of New Water Rights: With regards to the controversy and uncertainty of the connection between water quality and quantity, suggest editing the second sentence of the third paragraph to read the following. Water is available for new appropriation if the water is physically available from the source at the requested quantity. Legally, water is available for new appropriation if the requested appropriation will not impact the ability of existing water right holders to exercise their water rights; it is not detrimental to the public interest and is put to beneficial use.

4-4
4. Section 3.1.6.1 Last sentence of third paragraph, if stream flows are affected by ground water withdrawals, it doesn't necessarily mean impairment, unless there is an instream flow or other appropriators impacted. Thus, the sentence should read: In cases of hydraulic continuity between surface and ground water, impairment is defined if a new ground water appropriation diminishes surface flows such that existing water rights, including instream flow rules are impaired.

4-5
5. Section 3.1.6.3 Water Right Changes. In the second paragraph, we still do a public interest test for changes to ground water applications. Because the public interest is not explicitly stated as a condition to review in the surface water code, the Court ruled that Ecology does not have the authority to deny a surface water application on the public interest. Thus, change the last sentence to read something of this sort … the Court in Sullivan Creek… determined that because the public interest was omitted from consideration in the surface water code, where it was included in the ground water code, the Court concluded that the legislative intent was that public interest is not a proper consideration when Ecology acts on a change application under the surface water code, RCW 90.03.380.

4-6
6. Section 3.1.6.3 Water Right Changes. In the third paragraph of the this section, a surface water right can be changed not only in the point of diversion, but also the place of use and purpose of use can be changed (see 90.03.380.(1)). Moreover, it is exactly these kinds of changes which may have to be approved to estimate if the annual consumptive quantity of the water right will be increased.

4-7 7. Section 3.1.5.3 Water Right Changes. In the fourth paragraph, please add that the proposed water source must use the same source of water. We apply the same source test for both ground and surface water changes.

4-8 8. Section 3.1.5.3 Water Right Changes. In the fifth paragraph, it might be best to rework the first sentence to avoid the entanglement of quantity and quality to read that: Existing water rights are impaired if the proposed water right change would impact the ability of existing water users to exercise their water rights.

4-9 9. Section 3.1.5.3 Water Right Changes. In the fifth paragraph, the second and third sentences read like all changes are evaluated using the annual consumptive quantity. Suggest changing to read: To make a determination of impairment, Ecology must estimate the amount of water that has been perfected and is valid for change for the water right proposed to be changed. For water right change in which the applicant is requesting adding acres to be irrigated (i.e., spreading water) or an additional use, the annual consumptive quantity of the water right is determined. The annual consumptive quantity has been defined as the average of the highest 2 years of water use within the most recent 5 years of water use, minus any return flows. If the requested change increases the annual consumptive quantity, the change would enlarge the water right and impair other rights to use the water.

4-10 10. Section 3.2.6 Water Resources Management Program (173-500 WAC). In the fourth paragraph beginning with "in cases where surface and ground water…" Even though this is directly lifted from the rule, the wording isn't very clear. Suggest changing to: In a WRIA or WRIAs with instream resources protection rules (instream flow regulations), water rights which are issued after the adoption of the rules must be conditioned to ensure maintaining the base flows, if it is determined the water right will measurably impact these flows.

4-11 11. Section 3.4.1 Federal ESA. The description of Critical Habitat implies that it is designated every time a species is listed. Critical Habitat *can* be designated, but USFWS and NOAA Fisheries *do not have* to designate it if: identification is expected to increase the risk of harm to a species or its habitat, if designating critical habitat provides not benefit to the species and if the economic impact of designating critical habitat is high. Also, you might want to mention that Federal agencies are prohibited from authorizing funding or carrying out any action that will result in an impact to the critical habitat. Thus, the designation of critical habitat has a large regulatory burden for federal agencies.

4-12 12. Section 3.4.1 Federal ESA Section 9 Discussion. "Take" is defined for endangered species in the ESA. "Take" for threatened species follows the same definition for species regulated by the USFWS, but NOAA Fisheries has generally issued species-specific regulations, which may allow for some take.

4-13 13. Section 3.4.1 Federal ESA HCP Discussion. When describing a HCP, it might be important to state that a HCP can cover multiple species (both listed and unlisted), and that it is a long-term plan that limits the amount of protection and mitigation measures to the terms of the agreement, despite if the needs for the covered species change over time to need more stringent protection measures.

Chapter 4

4-14 Pg. 4-1 Sec. 4-1 1st paragraph: Capitalize Coast Range in the second sentence.

4-15 Pg. 4-1 Sec. 4-1 1st paragraph at the end: Puget Sound should be defined as a ***Marine*** estuary of the Pacific Ocean. The standard definition of an estuary would not fit the context of this sentence. See http://www.soes.soton.ac.uk/research/groups/soton_water/estuary.html

4-16 Pg. 4-1 Sec. 4-1 2nd Paragraph: "Deeply incised trenches have been cut into the plateau by the Columbia and Snake Rivers." This sentence is partially incorrect. The Missoula Floods during the last ice age carved out the channeled scablands where the Columbia River and part of the Snake River now flow. See this webpage for more detail. http://www.opb.org/programs/ofg/1001/missoula/

4-17 Pg. 4-3 Sec. 4-2-3 Only Paragraph: You might want to include studies or quotes about shrinking glacier volume and its effect on water storage and supply. Snow pack can't always be included with glaciers. The snow pack goes away every year and is the only source of recharge to some watersheds. Glacial ice hangs on in the summer and fall, feeding some of our major rivers when snow pack has disappeared.

4-18 Pg. 4-4 Sec 4-3-1 5th and 6th Paragraphs: There should be some mention of glacier feeding of rivers when snow has melted, or at least mention the contribution of glaciers in the process. These glaciers contribute a great deal to specific rivers during the late summer and early fall when precipitation is low and salmon start to spawn.

Chapter 5

4-19 RCW 90.82.070 Water Quantity Component appears to require two strategies be developed in a watershed plan. A strategy to relate to future water use by all water users and a strategy for increasing water supplies in the management area. A strategy for future use may include ideas like prioritization of beneficial uses (based in part on the understanding of future water needs in the basin by sector), identification of water use efficiency standards for each use, and that water users should perhaps have a legal water right (enforce against unauthorized users). The strategies for increasing water supplies in the area include the various storage options(places where aquifer storage and recovery or surface water storage may work) and the ideas of "enhanced" efficiency beyond that normally required (as identified in the future use section).

Suggest that the draft EIS be modified on page 5-3 (section 5.2) where it says " The identified alternatives fall within the following three general categories of potential recommended actions:

- Promote water use efficiency;
- Effectively manage allocation and use of water resources through legal mechanisms; and
- Develop or improve water resources storage infrastructure."

Suggest two categories, future water use and increasing water supplies in the management area. These categories fit the statute better.

4-20 Alternatives WP 13 & WP 14, page 5-7, add the idea of stream patrolman to the idea of watermaster. In theory, the stream patrolman is paid for by the water right holders. See

RCW 90.03.440. Many of the proposed alternatives in chapter 5 rely upon Ecology doing something. We should point out where the water users can help themselves and they pay for it.

5.2.4 Take No Action (page 5-9)

4-21 **Alternative WP 25.** Take no action regarding water quantity. The water quantity "no action" alternative is to be considered only in the context of WRIAs engaged in watershed planning under Chapter 90.82 RCW and is intended to provide a means of comparing the impacts associated with inaction with the impacts of various action alternatives. It is recognized that in a number of the state's WRIAs, watershed planning and management processes are occurring outside of the framework established under Chapter 90.82 RCW.

The above language from the draft EIS describes what a "no action" alternative is, but Ecology should not imply that a "no action" on this element of the plan is possible. The only required element of a watershed plan is the water quantity element - how to meet existing and future needs. The watershed plan would not be compliant with the law if the watershed planning group fails to do this element.

We should say that if a watershed plan comes in with no action on this point, that the plan would not be sufficient as a matter of law.

5.3 INSTREAM FLOW ALTERNATIVES

4-22 "**Alternative WP 26.** Request Ecology to set instream flows for protection and/or restoration by administrative rule (in the Washington Administrative Code, or WAC)." Recommend deleting the word "restoration" from the description. Ecology's statutory directive on instream flow protection is from chapters 90.22 and 90.54 RCW. Those statutes do not talk about restoration. To the extent a base flow or minimum flow established under chapters 90.22 and 90.54 RCW leads to restoration of fish, fish habitat, or riparian zones - great, but restoration is not the reason we adopt a flow. We should learn from what the SEA Program took on the SMA proposed rule and "implementing" ESA and should therefore avoid any insinuation or connection to ESA implementation.

4-23 The language of 5.3.1 "Under this alternative, a planning unit would provide Ecology with recommendations for setting instream flows for specific stream reaches within a WRIA in accordance with provisions of Chapter 90.82 RCW." is to limiting. Suggest we expand or add that chapters 90.22 and 90.54 RCW also guide, direct, set a floor for the establishment of instream flows when Ecology gets to rule-making. Nothing in chapter 90.82 RCW generally, or RCW 90.82.080 in particular negates the effect of or responsibilities of Ecology under chapters 90.22 and 90.54 RCW.

4-24 The language of 5.3.1 "The proposed instream flows would be developed for two primary water management purposes: to determine if and how much water is available for new out of stream uses, and to define the stream flows that would need to be met in the affected stream reaches." appears incorrect in the first part and sorta circular logic in the second. I suggest we take the language of RCW 90.54.020(3) (a) or RCW 90.22.010 and parrot them as the reason an instream flow is developed. An instream flow is not developed to " to determine if and how much water is available for new out of stream uses" rather the established instream flow is but one factor in a determination of water availability for a proposed new use. It is true that if an established instream flow has a history of not being met it will limit new uses -

usually by making the new rights subject to the instream flow (we've lots of interruptible rights and probably will in the future). An instream flow is not developed to "define the stream flows that would need to be met in the affected stream reaches." Rather the water management purpose for an instream flow is to define and adopt into rule a certain volume of water at a certain place and time to protect beneficial uses.

4-25 **5.3.2 Alternative WP 27.** Take no action regarding instream flows. This paragraph has the language "However, in both cases there may be an acute need to establish instream flows, but a planning unit may decline to engage in that activity.". These cases refer to the situations where an instream flow rule currently exists and the planning group decided not to propose a change or no instream flow rule exists. If an instream flow currently exists and the planning group makes a decision to not revise the rule, it is illogical to say "there may be an acute need to establish instream flows" since they are already established. Suggest dropping that last sentence of the paragraph.

4-26 An idea or issue that does not appear to come up here (perhaps it should) and/or be amplified upon in the Water Quantity section is that an established instream flow in rule is a water right. As a water right, the watershed plan should talk about how the instream flow right is going to be satisfied right along with how the other water rights are going to be satisfied. The "no action" alternative for instream flows can relate to new or revised rule-making and that should be distinguished from taking or proposing actions to satisfy an established instream flow as a water right.

4-27 **5.4.2 Improve Nonpoint Source Pollution Control** Perhaps this is a nit, but the alternative WP 37 can be construed to mean that measuring the water quality (put in a monitoring program) is going to somehow improve the nonpoint pollution control. The act of monitoring is not going to improve water quality. It is the actions taken to improve water quality with the knowledge of what the water quality is, that are the alternatives. Perhaps this paragraph can be reworded.

4-28 **Alternative WP 37** contains the sentence "Monitoring programs are essential supporting adaptive management programs." Perhaps the sentence would read better if it said - Monitoring programs are essential to support adaptive management programs.

4-29 **Alternative WP 38.** The first sentence of the indented paragraph is cumbersome. I suggest " Land use plans could be modified to limit the distribution or density of land uses with a relatively high potential for generating specific types of contaminants that result in ground or surface water quality degradation as identified through a Phase 2 Watershed Assessment."

4-30 In general under 5.4.3, Ecology should recommend that local government implement an effective enforcement program, perhaps a certain percentage of permits are field inspected. Not long ago the *Seattle P-I* had quite a story on the failure of the locals (and State) to enforce the SMA and implementing regulations. We have the same idea (enforcement) in the Water Quantity section, so perhaps we add it here.

Chapter 6

4-31 **6.1 Alternative WP 1: Develop and implement municipal conservation programs including demand management and operational efficiency measures. Scenic Resources and Aesthetics.** In the long-term impacts section, Ecology mention landscape ordinances (a potential element of a municipal conservation program) and the idea of requiring native plants that use less water. In the urban areas of Central Puget Sound, some Counties have adopted industrial landscape ordinances so those areas use less or no outside water. Other areas will probably do the same. Extending those types of ordinances to residential construction is controversial, but a planning group could come up with that recommendation.

4-32 **6.7.1 Impacts, Surface Water,** Long-term/operational impacts. This paragraph contains the sentence, "Water users interested in changing a water right usually must prove that no net impact will occur or provide mitigation measures to avoid impact." The sentence as it is, is usually not true. It is true that Ecology's WR program must address the four tests described near the end of the paragraph, and it is true that applicants usually must provide some information related to the change, but the applicant does not prove that no net impact will occur. No net impact is not a test for a change of a water right. We <u>strongly</u> encourage deleting the idea "or provide mitigation measures to avoid impact." Pursuant to RCW 90.03.253 an applicant can propose mitigation, but Ecology can not ask or require it. WR dealt with this for proposals in the Walla Walla rule regarding mitigation. Bill Neve, in our Walla Walla office can provide specifics. Our actions in the Walla Walla rule making sometime ago resulted in the RCW 90.03.253 language.

4-33 **6.7.2** - has the sentence "Transfer criteria under western water law mitigates impacts to other users whether junior or senior because transfers in water rights are granted only in cases of no injury." Suggest not referencing western water law, rather cite our State of Washington code. Secondly, it is not a mitigation (to less impacts) if a transfer is only approved if no injury. Perhaps this idea just needs rewording.

4-34 This section also has the sentence "If impacts are associated with a transfer request, mitigation measures such as augmentation plans can be developed to avoid injury." First, same comment as above on mitigation. Secondly, it is true that the applicant can propose mitigation, and faced with a denial of a water right they often come up with mitigation. We open ourselves for a Walla Walla-type controversy if we are not crystal clear on mitigation and the limitations imposed by RCW 90.03.253. With that said, perhaps a watershed plan can define areas wherein supplies are limited and mitigation would be required - that way the locals are saying it and we are not.

4-35 **6.9 Alternative WP 9: Transfer water through interties of public water systems or Irrigation systems,** Section 6.9.1 has the sentence "Interties typically involve inter-basin transfers of water." We do not believe that for NWRO or SWRO that sentence is true. Very few true interties are interbasin transfers of water. In the NWRO we do have source development in one basin and water use in another (Cedar River or Tolt River water from Seattle Public Utilities) but that is not an intertie. For the vast majority of systems (in Central Puget Sound) the waste water is discharged to salt, and so impacts to freshwater systems are minimal. Suggest reworking this section.

4-36 **6.13.1 Impacts several** of the subsections in this part have the line or idea "Assignment of a watermaster to a basin may increase enforcement against illegal water use within that basin." Water masters under the code (we have one left) regulate among rights, but do not do issue cease and desist orders on straight illegal diverters. The idea is correct; just do not call the person the water master.

4-37 **6.15 Alternative WP 15: Request Ecology to evaluate some set or subset of existing water rights within a basin or subbasin to identify those that are subject to relinquishment.** This section has the idea "Relinquished rights may result in lower amounts of "allocated water" which may or may not translate into "real" changes in stream flow." Correcting our paper water right world will not translate into real changes in stream flow, so we should not suggest that it may. A water right can only be relinquished if forfeiture has occurred (five years of nonuse) and sufficient cause for nonuse is not shown (See RCW 90.14.130). If we have five years of non use, merely correcting the paper does not change how much water is in the stream. Perhaps cleaning up the paper keeps somebody in the future from trying to hydrate (reenact) a right, but if that is what you were going after, rework this section. (Contact Doug and he can help with language.)

4-38 This section contains the line "Accounting more accurately for the allocated water may allow for future allocations of real water where it may be needed most. This alternative may increase surface flows and/or avoid future decreases in flows." The first sentence is true, the second is false. If the paper world is more accurately known, perhaps a future allocation is made and that would decrease flows.

4-39 In the Ground Water section (this is a nit, but we suggest two words for ground water; also in some places is=t is one word and other places it is two words), we have the same idea.
4-40 Implementation of this alternative could have the effect of increasing ground water levels should the reevaluation of water rights lead to reduction of current ground water withdrawals. A relinquishment action will not lead to the reduction of a current ground water withdrawal. It may lead to stopping a straight illegal diversion - but you covered that before. I think it is a bad idea to tell folks that cleaning up the paper will lead to lots more water in the stream or ground.

4-41 The language in the Land and Shoreline Use section will cause some consternation in some quarters because it will be read that Ecology is out to "take away water rights". Consider deleting it.

6.19 Alternative WP 19: Construct and operate new on-channel storage facilities.

6.19.1 Impacts

Earth

Short-term impacts
Short-term impacts to earth resources associated with this alternative could occur from construction activities. These temporary construction-related impacts to earth resources would be the same as those discussed in ***Section 6.1.1.***

6.1.1 Impacts

Short-term impacts
Short-term impacts to earth resources associated with this alternative could occur should the alternative entail significant construction activities (for example, leak repair, and distribution system upgrades). Activities such as land clearing, excavation, and filling could increase soil erosion by removing protective vegetation, disaggregating the soil, and modifying slopes and drainage patterns. The magnitude of these potential impacts would depend on the type and

scale of the construction activities, the inherent erodibility of the local soils, the local climate, and the season during which the construction would occur.

4-42 *Construction impacts will be contingent on the Dam Safety Office's (DSO) review of design plans and on-site construction inspections, which in order to conform to DSO regulations can produce changes in both the scope and practice of construction during the construction phase. The point being that predictions of environmental impact due to construction prior to the construction phase will be difficult to make.*

Long-term/operational impacts
It is possible that the increased level and weight of the water stored in such facilities could lead to geologic instabilities. These impacts could include local subsidence, increased slope failures, and erosion due to development of new seeps and springs. In addition, construction of these facilities would involve consumption of earth resources, such as gravel, sand, and concrete.

4-43 *In the long term changes to structural elements might be required as changes to watershed hydrology and downstream risk assessment occur and these could lead to changes in long term environmental impacts. The point here is that long term environmental impact predictions will have to include the potential development of both the watershed and areas surrounding the downstream channel.*

Surface Water

Short-term impacts
Temporary construction-related impacts may be associated with the construction of new storage facilities. On-channel impacts may occur primarily during dam and overflow spillway construction phase. Interruption of flow may occur during this phase.

4-44 *Temporary impacts may also include:*

- *Potential intermediate-term post-construction sediment loading to the downstream channel from sloughing and superficial surface erosion of earthen berms, until the berm surface reaches structural stability.*
- *Increased Sediment loading to the reservoir from bank sloughing, until the banks reach structural equilibrium.*
- *The construction phase can also pose unique threats from dam breach due to the fact that the sequence of construction may leave short periods where structural elements and failsafe design features are incomplete or awaiting final inspection. As part of the EIS, the construction plan should be evaluated to identify these vulnerabilities and modified to minimize the probabilities of inadvertent failure due to lapses in construction management.*

Long-term/operational impacts
Construction of new on-channel storage facilities may change the stream reach from free flowing to a regulated river, thereby affecting the flow regime and stream morphology processes downstream. The storage structure would, by design, change the flow regime by storing more water during high flow periods and presumably releasing it during lower flow periods to augment in stream flows and other beneficial uses. The specific nature of the impacts to surface water resources would depend on how the storage facility was operated. Evaporative losses would be predicted from any reservoir.

Construction of on-channel storage facilities may have substantial long-term effects on water quality. Effects may include, but may not be limited to:

- Decreased turbidity and bed load sediment downstream of the impoundment;
- Increased stream temperature downstream of the impoundment;
- Decreased dissolved oxygen downstream of the impoundment;
- Increased stream temperature within the impoundment;
- Potential for eutrophication of water where nutrient levels are high; and
- Potential for the accumulation of pollutants in the sediments at the headwaters of the impoundment.

The extent of the impacts of on-channel storage facilities on water quality will be dependent upon the size of the facility. Small impoundments (for example, impoundments the size of stock ponds or run-of-river diversions) may not have substantial effects on water quality. Large dams may have very significant effects. The local nutrient loading and the mitigation measures incorporated into the project will also influence the changes in water quality associated with on-channel facilities.

4-45

Other long term impacts may also include:

- *Long term rapid fluctuations in reservoir and downstream channel water surface levels dependent on gate operation, that will have large impacts on near bank and over bank biota.*
- *Seasonal increases to downstream sediment loading and gas entrainment resulting from rapid drawdown in anticipation of flood events (Flushing of sediment accumulation behind the dam and spill water gas entrainment)*
- *Blockage of natural debris carried downstream by the stream, impacting the organic loads in the stream.*
- *Potential changes in downstream over bank soil characterization and riparian zone vegetation due to changes in flood inundation profile (flood control).*
- *Eventual silting of the reservoir that will require dredging or render the structure inoperable, with the ensuing environmental impacts.*
- *Potential breach events resulting in catastrophic flood inundation profiles*

Construction of on-channel storage facilities also requires substantial disturbance of earth.

Ground Water

Long-term/operational impacts
Implementation of this alternative could substantially increase ground water levels in the vicinity of the storage facilities. The magnitude of this potential impact would depend on the size, depth, and permeability of the storage facility and on the properties of the underlying aquifers.

4-46

Operational impacts may include:

- *With respect to dam safety regulations, a permanent and periodic inspection program in the vicinity of the dam will have to be maintained by the dam owners to monitor for potential seepage near the toe of the dam and its abutments.*
- *As needed, permanent and periodic monitoring by the dam owners of ground water surface levels may be required at locations in or near the impoundment.*

Plants

Long-term/operational impacts
The operation of new on-channel storage facilities would involve permanent loss of plant communities in areas covered or inundated by the facility. Additional humidity and change in hydrology through inundation may alter the existing plant communities (riparian or upland) near the shoreline.

4-47

Operational impacts may include:

- *With respect to dam safety regulations, all large and deep rooted plants will be permanently prohibited on the face of earthen impoundment structures. Grasses or other shallow rooted plants will have to be permanently maintained to permit regular and unhindered inspection of the impoundment surface.*
- *Plant debris in the reservoir will have to be periodically removed from the upstream face of the impoundment, with particular attention given to keeping spillways and outlets free of debris.*

Sediment inputs to streams will be short-term but may be significant. The effects of those inputs are described in Section 6.2.1

Environmental Health

Long-term/operational impacts
Failure of a dam or other on-channel storage facility may result in significant adverse public health and safety impacts. Based on national statistics, dam failures are caused by overtopping (34% of failures), foundation defects (30%), piping failures and seepage (20%), conduits and valves (10%), and other causes (6%) (Ecology 2002). Numerous dam failures have occurred in Washington State, including the White River Incident in July 1976, which resulted in the loss of two lives, and the Eastwick Railroad Fill Failure near North Bend in 1932, which resulted in the loss of seven lives. In addition, the Seminary Hill Reservoir failed in October 1991 due to a massive landslide beneath the embankment that released 3.5 million gallons of water in less than three minutes, flooding a residential area and destroying or damaging numerous homes.

Potential health impacts associated with a dam failure may range from none to extensive loss of life, depending on the size and location of the dam.

4-48

The impacts of a failure are not limited to loss of life or damage to residential areas. Other impacts of a dam failure may include:

- *Loss of or damage to downstream public infrastructure including wastewater treatment systems, water conveyance systems, bridges, electrical power systems, and emergency response facilities.*
- *Release of deleterious materials resulting in short or long term water quality impacts and general environmental degradation.*
- *Deposit of degraded water and biologically contaminated material that will increase the risk of communicable diseases.*
- *Loss of transportation links, including roads and rail lines*
- *Loss of water supply and irrigation supply.*

- *Damage of to down stream public facilities including fish hatcheries, hospitals, industrial and commercial developments, and government buildings*
- *Extreme scouring of the river channel and over banks, resulting in changes to channel hydraulics, habitat, and esthetics.*
- *Economic activity curtailments.*

6.19.2 Mitigation Measures

Earth

Mitigation measures for temporary construction-related impacts to earth resources associated with this alternative are the same as those discussed in Section 6.1.2.

The potential long-term geological instability caused by the increased level and weight of the impounded water could be avoided through proper geotechnical design and long-term monitoring of facility.

4-49 *There should be an appreciation that there are limitations to our understanding of geological structures and of the efficacy of designs to control instabilities. Our knowledge of the geology of a particular project will depend on many uncontrollable factors and will ultimately be probabilistic. Our evaluation and solutions for geotechnical problems are therefore probabilistic and there is no absolute guarantee that a particular geotechnical design will be appropriate for a particular location or will be effective in avoiding instabilities. Also cost is a large consideration in the practicality of mitigation designs and will vary widely depending on the project.. These costs will not always be reasonable in light of the economic benefit of the project and will thus render a mitigation design impractical. The above language fails to capture the difficulties inherent to geotechnical design. The previous discussion also applies to monitoring with the further caveat that even impeccable monitoring data will not always allow us to predict geological response.*

6.20 Alternative WP 20: Raise and continue to operate existing on-channel storage facilities.

6.20.1 Impacts

4-50 *With respect to dam safety considerations any modification to the dam structure will require the authorization of the Dam Safety Office (DSO) and must conform to the provisions of guidelines for structural modifications outlined in WAC 173-175. It should be noted that in a reservoir volume typically increases as a power function of water surface elevation, thus creating progressively increased risk to downstream residents and properties from flood inundation. It should also be understood that this will alter a whole constellation of factors that effect the environmental impacts of the project. This results because as the flood inundation profiles increases in cross sectional area the average velocity and depth increase and thus the forces associated with the flood wave that impact downstream structures will increase as well. This increase in forces will produce a non-linear increase in downstream hazard assessment, which will in turn will require changes in the structural elements of the impoundment. These structural changes, the increased reservoir volume, and the increased inundation profile will change the dynamics of short and long term environmental impacts in all modalities. The key here is to realize that linear increases in water surface elevation will create non-linear increases in potential environmental impacts.*

6.21 Alternative WP 21: Construct and operate new off-channel storage facilities.

6.21.1 Impacts

4-51 *Off-channel impoundments create many of the same concerns associated with on-channel impoundments with regard to breach impacts, since any dam breach inundation will effectively create its own channel, following the topological gradient until it reaches a natural channel. Of note is the fact that scouring may be more severe than in natural channels due to the unconditioned quality of the top soil, thus potentially producing more sediment loading to the down gradient surface water that receives the dam breach flood.*

6.22 Alternative WP 22: Raise and continue to operate existing off-channel storage facilities.

6.22.1 Impacts

4-52 *Same dam safety regulatory and environmental impact concerns as with on-channel structural modifications.*

6.23 Alternative WP 23: Extend use of existing storage facilities to additional beneficial uses.

6.23.1 Impacts

4-53 *Unanticipated dam safety regulatory and impact concerns that will require evaluation on a case-by-case basis.*

6.26.1 Impacts. (Comments could be applied to many of the sections in this alternative.)

Surface Water

4-54 First paragraph, second sentence – The sentence reads: " Instream flow levels are used by Ecology to condition future permitted surface water uses,…" Ecology doesn't condition unpermitted uses, which this implies. Additionally, Ecology uses instream flows to condition water right permits that might be in hydraulic continuity with the stream where instream flows have been set.

4-55 Second paragraph, first sentence – The point of the sentence is not clear. If it means that instream flows set in regulation cannot condition exempt uses; that would be an error. While exempt uses may be exempt from the permitting requirement, they are not exempt from regulation. The sentence would lead readers to think exempt uses coming after an instream flow was established would not be subject to the instream flow - which would not be right. The priority date for exempt uses is established as the date when the water was first put to beneficial use. The date of first beneficial use would then be compared to the adoption date of the instream flow regulation and then Ecology would regulate based on the seniority.

Ground Water

4-56 Setting an instream flow can impact ground water if the ground water is in hydraulic continuity with the body of water where the instream flow level is set. Generally, it is a case of the degree of hydraulic continuity.

Public Service and Utilities

4-57 Suggest moving the third paragraph ("Establishing instream flows….." in this section to the introduction. The information is good, but doesn't fit.

4-58 If an instream flow is set, it could preclude future out-of-stream development (or at least influence it in some way, depending of the specific instance) because there might not be enough water to meet both instream flows and out-of-stream uses.

4-59 If a rule for setting instream flows is contemplated (or proposed), it can cause a rush (however large or small) for people who seek to get a priority date before the adoption date of the instream flow so as not to be subject to it.

Letter 4 – Response to comments from Washington Department of Ecology, Water Resources Program

4-1 Comment acknowledged. The text of Section 3.1.1 has been modified to address the comment.

4-2 Comment acknowledged. The text of Section 3.1.2 has been modified to address the comment.

4-3 Comment acknowledged. The text of Section 3.1.6.1 has been modified to address the comment.

4-4 Comment acknowledged. The text of Section 3.1.6.1 has been modified to address the comment.

4-5 Comment acknowledged. The text of Section 3.1.6.3 has been modified to address the comment.

4-6 Comment Acknowledged. The text of Section 3.1.6.3 has been modified to address the comment.

4-7 Comment acknowledged. The text of Section 3.1.6.3 has been modified to address the comment.

4-8 Comment acknowledged. The text of Section 3.1.6.3 has been modified to address the comment.

4-9 Comment acknowledged. The text of Section 3.1.6.3 has been modified to address the comment.

4-10 Comment acknowledged. The text of Section 3.2.6 has been modified to address the comment.

4-11 Comment acknowledged. The text of Section 3.4.1 has been modified to address the comment.

4-12 Comment acknowledged. The text of Section 3.4.1 has been modified to address the comment.

4-13 Comment acknowledged. The text of Section 3.4.1 has been modified to address the comment.

4-14 Comment acknowledged. The text of Section 4.1 has been modified to address the comment.

4-15 Comment acknowledged. The text of Section 4.1 has been modified to address the comment.

4-16 Comment acknowledged. The text of Section 4.1 has been modified to address the comment.

4-17 Comment acknowledged. The text of Section 4.3.1 has been modified to address the comment.

4-18 Comment acknowledged. The text of Section 4.3.1 has been modified to address the comment.

4-19 The process of categorizing the various alternatives (probable recommended actions) that were suggested by individuals involved in local watershed planning efforts was an open process that took place over a number of months. The categories that were ultimately used in the draft environmental impact statement were developed with input from Ecology's Water Resources Program staff. Thus, no changes will be made to the text.

4-20 Comment acknowledged. The narrative for Alternative WP 13 has been modified to address the comment.

4-21 Chapter 90.82 RCW does not require that a plan be approved by a planning unit or by the jurisdictional county legislative authority. Planning can be terminated within a WRIA or multi-WRIA planning area. The planning requirements, that is, what a plan must include if it is to be approved, are adequately discussed in Sections 1.4 and 1.5 as well as the introduction to Section 5.2.

4-22 Comment acknowledged. The reference to restoration in Alternative WP 26 has been removed.

4-23 The relationship of Chapter 90.82 RCW to Chapter 90.22 RCW and Chapter 90.54 RCW is discussed in Section 3.2.5. Some of that discussion will be reiterated in the narrative for Alternative WP 26 for clarity.

4-24 Comment acknowledged. The narrative for Alternative WP 26 has been modified to address the comment.

4-25 Comment acknowledged. The narrative for Alternative WP 27 has been modified to address the comment.

4-26 This issue is addressed in Section 3.2.

4-27 The alternative is clearly intended to be viewed in the context of an adaptive water quality management program; thus, it is categorized appropriately.

4-28 Comment acknowledged. The narrative for Alternative WP 37 has been modified to address the comment.

4-29 Comment acknowledged. The narrative for Alternative WP 38 has been modified to address the comment.

4-30 The watershed planning environmental impact statement is not an appropriate vehicle for Ecology to make recommendations or suggestions to local planning groups concerning what they should include or not include in their watershed plans. As described in Section 5.1 of the environmental impact statement, the alternatives presented and evaluated in this document were developed based on input received from individuals directly involved in local watershed planning efforts through interviews and questionnaires. Ecology recognizes that watershed planning is a locally driven process and believes it would be inappropriate for the department to propose alternatives as that might unduly influence local decision making processes.

4-31 Use of native plants in landscaping is identified as a demand management tool in the narrative for Alternative WP 1 in Section 5.2.1. The narrative will be modified to include a specific reference to landscaping plans.

4-32 Comment acknowledged. The text of Section 6.7.1 (Surface Water) has been modified to address the comment.

4-33 Comment acknowledged. The text of Section 6.7.2 (Surface Water) has been modified to address the comment.

4-34 Comment acknowledged. The text of Section 6.7.2 (Surface Water) has been modified to address the comment.

4-35 Comment acknowledged. The text Section 6.9.1 and 6.9.2 has been modified to address the comment.

4-36 RCW 90.03.070 states that a watermaster:

> . . . shall enforce such rules and regulations as the department from time to time prescribes.

4-37 Comment acknowledged. The text of Section 6.15.1 has been modified to address the comment.

4-38 Comment acknowledged. The text of Section 6.15.1 has been modified to address the comment.

4-39 Comment acknowledged. A word search was conducted to eliminate the inconsistency.

4-40 Comment acknowledged. The text of Section 6.15.1 has been modified to address the comment.

4-41 Comment acknowledged. The text of Section 6.15.1 has been modified to address the comment.

4-42 It is acknowledged that there is the potential for changes related to the actions of the Dam Safety Office. Additionally, there is a potential that the project engineer may make changes to design and construction practices after construction has begun. The text in Section 6.19.1 (Earth – Short-term impacts) has been expanded to reflect this.

4-43 Comment acknowledged. The text of Section 6.19.1 (Earth – Long-term/operational impacts) has been revised to reflect that changes to structural elements may be required as development of the watershed and downstream channel occur.

4-44 Comment acknowledged. The text of Section 6.19.1 (Surface Water) has been modified to address the comment.

4-45 Comment acknowledged. The text of Section 6.19.1 has been modified to address the comment.

4-46 Comment acknowledged. The text of Section 6.19.1 (Ground Water) has been modified to address the comment.

4-47 Comment acknowledged. The text of Section 6.19.1 (Plants) has been modified to address the comment; sediment input to streams is already discussed in Section 6.2.1.

4-48 Comment acknowledged. The text of Section 6.19.1 (Environmental Health) has been modified to address the comment.

4-49 Comment noted; no changes made to the text.

4-50 Comment acknowledged. The text of Section 6.20.1 has been modified to address the comment.

4-51 Comment acknowledged. The text of Section 6.21.1 has been modified to reference to Section 6.19.1.

4-52 Comment acknowledged. The text of Section 6.22.1 has been modified to reference to Section 6.19.1.

4-53 Comment acknowledged. The text of Section 6.23.1 (Surface Water and Environmental Health) has been modified to address this comment.

4-54 Comment acknowledged. The word “permitted” has been eliminated to avoid this confusion. A sentence addressing conditioning based on hydraulic continuity has been added to Section 6.26.1 (Surface Water).

4-55 Comment acknowledged. The phrase addressing exempt uses has been deleted for clarification.

4-56 Comment acknowledged. The text of Section 6.26.1 (Ground Water) has been modified to address this comment.

4-57 The information in the third paragraph describes short-term impacts to governmental services associated with the alternative and, as such, is appropriately placed in the Public Services and Utilities section.

4-58 Comment acknowledged. This issue is addressed under Land and Shoreline Use.

4-59 Comment acknowledged. The text of “Public Services and Utilities” within Section 6.26.1 has been modified to address the comment.

TO: Derek Sandison
Central Regional Office, WADOE

FROM: Tom Clingman, lead staff WRIA 13 Watershed Planning Project

DATE: May 12, 2003

SUBJECT: **COMMENTS ON "DEIS FOR WATERSHED PLANNING UNDER RCW 90.82", March 2003**

Thank you for the opportunity to comment on this draft document. I am very hopeful that this will be useful to many WRIA committees as they move through the adoption process. This document provides an excellent foundation for non-project SEPA compliance, a good overview of legal mechanisms and a useful compendium of options.

Comments on the draft:

1. Page 1 – 10 Item 1.6 STATE RULE-MAKING PROCESS

It seems like this would benefit from an introductory statement regarding potential
5-1 role of state rule-making in the WRIA planning program, along the lines of:

> <u>Watershed Plan recommendations cannot directly change rules or laws. However, recommended changes to State agency administrative rules may be important implementing measures to achieve objectives of watershed plans.</u>

5-2 2. Page 4 – 13 Chum Salmon: Looks like 2nd paragraph should reference chum (not coho) salmon.

3. Page 5 – 4 Alternative WP 5. **Wastewater reclamation** and reuse is an important
5-3 emerging issue across the state. This section would be strengthened by expressly
identifying the range of potential benefits from reclaimed water that can improve
water resource management. Suggested revisions to text:

"Reclaimed water" is defined as "effluent derived in any part from sewage from a
wastewater treatment system that has been adequately and reliably treated, so that as a
result of that treatment, it is suitable for a beneficial use or a controlled use that would not
5-4 otherwise occur and is no longer considered wastewater" (RCW 90.46.010(4)).
<u>Depending on the degree of treatment (class of reclaimed water)</u> reclaimed water can be used
for industrial and commercial uses, in land application (for
example, irrigation), direct recharge of ground water, discharge to wetlands, surface
percolation, and stream flow augmentation. <u>A primary</u> purpose of this alternative is to reduce
5-5 the consumption of potable water for those uses for which reclaimed water would be
suitable. Thus, the conserved potable water would become available for other beneficial
uses. <u>Reclaimed water could also be used to directly augment stream flow or to recharge</u>
5-6 <u>ground water that supports stream baseflow. Ground water artificial recharge and recovery</u>
<u>is another potential beneficial use of reclaimed water.</u> Reclamation is also a means of
reducing discharges of wastewater to receiving
waters (See also Alternative WP28).

4. Page 5-5 Section 5.2.2 **Legal Mechanisms to Effectively Manage Allocation and Use**:

An important element seems to be missing in this section regarding the wide range local water right policy guidance that may be recommended by planning groups. For example, WRIA 13 committee members have expressed concern regarding water right transfers that remove water from within the designated Urban Growth Area. Another possible policy concern is protecting water sources for lands zoned for exclusive agricultural use: a local group might recommend that DOE and local Water Conservancy Boards preclude transfers that could "strip" Ag Zone properties of water where this would have an adverse outcome on the intended long-term agricultural
5-7 land use.

These kinds of WRIA-based water right policies/guidance don't seem to fit under the Alternatives as described in this section. It would additionally be helpful to identify the type of DOE actions required to implement such policies (new/modified rule? Adopted DOE guidance for water right permit staff and Conservancy Boards?) Legislation might be required to enact some recommendations. To the extent these can be forecast, potential Plan recommendations requiring legislative action would seem appropriate to consider in this non-project EIS (or at least recognize that some recommendations may require legislation.)

5. Page 5-5 (also 6-33 to 35 – **Greywater**: Our Health Department staff are looking examining this item. This may not be a technically well-founded concept for watershed plans. Thurston County has found that "greywater" systems include fecal
5-8 coliform bacteria and need treatment along with the rest of domestic wastewater. In large part, on-site septic drainfields (particularly pressure distribution systems that spread effluent though out the drainfield) are essentially sub-irrigation systems with a high percentage of secondary recharge to ground water – conveying many of the benefits of "greywater" systems while providing treatment of domestic wastewater.

6. Page 5-6 Alternative WP 10 – **Allocation of Additional Water**: In areas that are "closed" to consumptive appropriation, new rights will be contingent on mitigation of impacts to instream flow. Local plans may recommend conceptual frameworks for
5-9 mitigation. Such guidance is directly linked to the "not impair" and "public interest" water right tests. See Comment 11 below.

It would be helpful to identify the type of DOE action required to confirm mitigation frameworks (i.e. would these be a request for DOE rule? Or DOE guidance adoption? Same basic issue as comment item above.)

7. Page 5-9 Alternative WP 24. Add clarifying statement that **recharge and recovery**
5-10 **of reclaimed water is addressed in WP 5.**

8. Page 6 – 26 Alternative WP 5: **Reclamation – Impacts**

Surface water: Stream flow augmentation is another important potential use of reclaimed water. Suggest adding a second paragraph along the lines of:

> 5-11 Reclaimed water may be used to directly or indirectly augment stream flow. Indirect augmentation may be achieved through infiltrating reclaimed water to ground water that supports summer instream flow.

Need to also recognize that some wastewater outfalls are directly to surface waters
5-12 and that diversion to reclamation/reuse may raise concerns regarding impact on low-flow conditions due to long-established reliance on the wastewater flow input.

5-13 **Ground Water**: Add a second sentence reflecting that artificial ground water recharge may benefit instream flow where the recharged aquifer is in continuity with surface waters.

5-14 9. Page 6 – 31: "**Energy and Natural Resource impacts**" of reclaimed water: Basic concept in the text reflects LOTT strategy in Thurston County area, which intends to build a handful of "satellite" reclamation plants as additional treatment capacity is needed. However, second sentence confuses *source* for reclamation plants - which is wastewater effluent. Also uses modifier of "self-contained": In LOTT and in Clark County, utilities are finding that the best configuration involves continuing to send solids to the central treatment plant for processing rather than handling solids at each satellite reclaimed water plant. Suggest revision along lines of:

> Small~~, self-contained~~ treatment plants could be located near ~~each~~ suitable sources of wastewater ~~reclaimed water~~ with on-site storage of the reclaimed water for localized use.

5-15 10. Page 6 – 31, Recreation: Likely misplaced here in Reclaimed Water section. In any case, something awry with the second sentence regarding shortened boating seasons and lengthened boat ramps.

11. Page 6 – 52: Alternative 10, Allocate additional water, item 6.10.2 **Mitigation Measures**

Discussion needs to be more comprehensive regarding potential mitigation measures. This is a complex issue but DOE is initiating dialogue on this: See April 2003 report "Mitigation Measures Used in Water Right Permitting" from DOE Water Resources Program. If you don't already have this it is at http://www.ecy.wa.gov/programs/wr/instream-flows/Images/pdfs/mitmeas.pdf

5-16 For example, under "Surface Water", DEIS text addresses evaluation and limiting withdrawal to avoid or minimize impact. However, *quantifying* likely impact and *mitigation* through in-kind and out-of-kind measures acceptable to DOE is not discussed. This is a crucial issue for any additional allocations where stream flow is protected through "closure" rules or through application-specific review of impact on instream flow – a very widespread (universal?) condition for water right review. You might lift and refine some of the text from the Executive Summary in the April DOE "Mitigation Measures" report. See in particular the first and third paragraphs. They seem to provide a good overview (and have obviously been vetted by Water Resource Program).

5-17 12. Page 6 – 68 Alternative 17: **Land and Shoreline Use "Long-term/operational impacts"**. (Note: Section heading out of alignment.)

The draft text overstates (perhaps oversimplifies) conflict with GMA. The implication is that availability of water would "break" local land use plans by triggering urban-level growth outside designated areas.

5-18 GMA is self-regulating. Local plans have strong guidance from legislature and oversight by state agencies and hearing boards. Water availability would not automatically drive inconsistent growth. The "rub" would come if an area slated for future urban development was found to have inadequate water, while a different area was found to have adequate source water that can be utilized without unacceptable environmental impairment. This could (should?) lead to a revision of the local growth management plan to *shift* future growth capacity to a different area in recognition of water supply conditions – a measure that fully complies with the intent of GMA to accommodate growth where adequate infrastructure can be provided. Water is not emphasized in GMA legislation but in some cases may be a crucial component of adequate infrastructure to support future growth.

5-19

13. Page 6 –70: Cumulative Impacts, "Land and Shoreline Use": Same comment as above. The draft text overstates impact of water supply directly driving growth patterns and oversimplifies GMA/water supply dynamic. GMA directs that growth will occur - the State even parcels out population figures that local areas need to accommodate. "Unavoidable impact" may be the necessity of shifting location for future growth from water-short areas to those with adequate future supply – or to negotiate with the State if an entire region determines that it simply does not have adequate water supply to accommodate their allocated future growth. The litany of important environmental impacts in the text is associated with land use plans adopted in a separate arena.

5-20

14. Alternative WP 18: Metering

I know the effect is basically the same but I suggest the following description would be more apt:
"Request Ecology to implement statutes and permit-specific conditions for monitoring and reporting water use." There are many permits that contain specific requirements for measuring water use. Simply implementing these provisions would go far toward better understanding of water resource use – with no new statutes or other innovations (except a data storage and retrieval system. This is in development, as I understand it due to the metering lawsuit outcome.)

Letter 5 – Response to Comments from Tom Clingman, Thurston County Water and Waste Management

5-1 Comment acknowledged. The introduction to Section 1.6 has been modified to reflect your suggestion.

5-2 Comment acknowledged. The text of Section 4.6.2.2 has been modified accordingly.

5-3 Comment acknowledged.

5-4 Comment acknowledged. The narrative for Alternative WP 5 has been modified accordingly.

5-5 The environmental impact statement contains two alternatives that involve requesting local governments or sewer utilities to construct and operate water reclamation and reuse facilities. One alternative, Alternative WP 5, is a Water Quantity component alternative that is intended to "promote water use efficiency" and the other, Alternative 28, is a Water Quality component alternative that is intended to "improve nonpoint source pollution control." Thus, the existing text accurately reflects the purpose of Alternative WP 5 as being to "reduce consumption of potable water for those uses for which reclaimed water would be suitable."

5-6 The narrative for Alternative WP 5 has been expanded to acknowledge that stream flow augmentation can be accomplished through direct and indirect methods.

5-7 Comment acknowledged. As described in Section 5.1 of the environmental impact statement, the alternatives presented and evaluated in the document were developed based on input received through interviews and questionnaires from individuals directly involved in local watershed planning efforts. Ecology recognizes that watershed planning is a locally driven process and believes it would be inappropriate for the department to propose alternatives (recommended actions) as that might unduly influence local decision making processes.

As noted in your comment, there may be a number of different methods for implementing water right policies for a WRIA in response to an approved watershed plan, including state agency rule making and rule amendment as well as, potentially, statutory changes enacted by the legislature. It is important to note that the watershed planning environmental impact statement is not intended to be a guidance document. In addition, since it is a statewide nonproject environmental impact statement, it would be difficult to offer meaningful guidance on a specific local issue. Requests for guidance concerning water right policy issues specific to your watershed should be directed to Ecology's Water Resources Program through the Ecology Watershed Lead.

5-8 The greywater alternative was included in the environmental impact statement based on input received during the alternatives development process from individuals directly involved in local watershed planning efforts. Please note that the alternative contains the caveat that greywater systems would only be used in accordance with Washington State Department of Health standards. These standards were developed by the Department of Health with recognition of the possible public health and water quality problems that could arise associated with the use of such systems. The standards contain measures to avoid such problems and assure safe use of greywater systems. While, based on your comment, a determination has apparently been made that the use of greywater systems is inappropriate for Thurston County, that does not foreclose on use of such systems in other parts of the state where conditions may be more favorable.

5-9 The discussion concerning Alternative WP 10 in Section 5.2.2 is intended to introduce the alternative. Mitigation for this alternative is discussed in Section 6.10.

5-10 Comment acknowledged. The narrative for Alternative WP 24 has been modified accordingly.

5-11 Comment acknowledged. The text of Section 6.5.1 (Surface Water) has been modified accordingly.

5-12 Comment acknowledged. The text of Section 6.5.1 (Surface Water) has been modified accordingly.

5-13 Comment acknowledged. The text of Section 6.5.1 (Ground Water) has been modified accordingly.

5-14 Comment acknowledged. The text of Section 6.5.2 (Energy and Natural Resources) has been modified accordingly.

5-15 Comment acknowledged. The text of Sections 6.5.2 (Recreation) and 6.5.3 (Recreation) has been stricken.

5-16 Comment acknowledged. Additional information concerning mitigation for surface water and wildlife impacts has been provided in Section 6.10.2 (Surface Water).

5-17 Comment acknowledged. The heading has been realigned.

5-18 The text does not suggest that the alternative would "break" local land use plans, simply that it may create pressure from land owners and/or developers in affected areas for modifying existing plans. The specific concern being addressed is that the alternative could involve extension of urban levels of utility services into rural areas, which would be counter to the Growth Management Act. It would not necessarily conflict with land use plans developed by non-Growth Management Act counties and cities.

5-19 See response to Comment 5-18.

5-20 The text of Alternative WP 18 was not modified; however, the description of the alternative in Section 5.2.2 has been amended to incorporate the suggested language.

Other Modifications to the Environmental Impact Statement

The following changes were made to the document in addition to modifications made in response to comments received on the draft environmental impact statement:

- Text was added to Section 1.5.4 describing the watershed planning “Phase Four” legislation enacted by the 2003 legislature;

- A Section 1.5.5 was added to describe other bills passed by the 2003 legislature that directly affect Chapter 90.82 RCW;

- A Section 3.1.7 was added providing summaries of other water related legislation passed by the 2003 legislature;

- Additional text was added in Section 3.3.2.2 discussing the newly adopted revised state surface water quality standards; and

- The narrative for Alternative WP 8 in Section 5.2.2 was expanded to include a discussion of water banking in response to passage of Engrossed Substitute House Bill 1640 by the 2003 legislature.

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