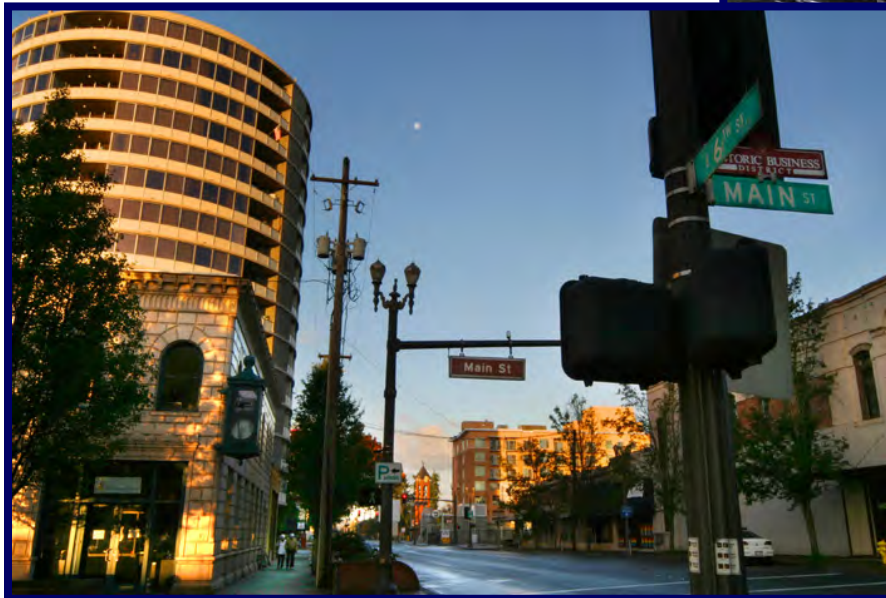




Salmon-Washougal and Lewis Detailed Implementation Plan

*"Our mission is to develop and
implement a watershed
management plan for the
responsible use of water to
balance the needs of people and
natural resources."*



**Volume I- Narrative and
Appendices A-D**

**Lower Columbia Fish Recovery Board, Lead Agency
Counties of Clark, Cowlitz and Skamania**

June 9, 2008

Salmon-Washougal & Lewis Detailed Implementation Plan

WRIA 27 and 28



**WA Department of Ecology
Grants G0700278, G0700274, G0800067**

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Volume I of III

Approved June 9, 2008



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K.	LCFRB's RM&E Program Description
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Acronyms

ACWSP	Abbreviated Coordinated Water System Plan
ADD	Average Day Demand
AFY	Acre Feet Per Year
APA	Aquifer Protection Area
ASR	Aquifer Storage and Recovery
BMP	Best Management Practice
CARA	Critical Aquifer Recharge Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFS	Cubic Feet Per Second
CIR	Crop Irrigation Demand
CMS	Comprehensive Monitoring Strategy
COA	Coordination and Oversight Agency
CPU	Clark Public Utilities
CWA	Clean Water Act
DIP	Detailed Implementation Plan
DO	Dissolved Oxygen
DOH	Washington State Department of Health
EAP	Environmental Assessment Program
Ecology	Washington State Department of Ecology
EES	Economic and Engineering Services
EIS	Environmental Impact Statement
ENSO	El Nino/Southern Oscillation
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
ESHB	Engrossed Substitute House Bill
FC	Fecal Coliform
FERC	Federal Energy Regulatory Commission
FFA	Washington Farm Forest Association
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FTE	full time equivalent
GMA	Growth Management Act
GPM	Gallons Per Minute
GPS	Global Positioning System
GWAC	Ground Water Advisory Committee
GWMA	Ground Water Management Area
GWMP	Ground Water Management Plan
HWS	Habitat Work Schedule
IFIM	Instream Flow Incremental Methodology
IOCs	Inorganic Compounds
IWS	Implementation Work Schedule
LCFRB	Lower Columbia Fish Recovery Board
LFA	Limiting Factors Analysis
LWD	large woody debris
MCLs	Maximum Contaminant Levels

Acronyms - Continued

MDD	maximum day demand
MGD	Million Gallons Per Day
MOU	Memorandum of Understanding
MTBE	methyl tertiary-butyl ether
NA	Not Applicable
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWPPC	Northwest Power Planning Council
PDO	Pacific Decadal Oscillation
PGG	Pacific Groundwater Group
PUD	Public Utility District
PWR	Pacific Water Resources, Inc.
PWS	Public Water System
Qa	authorized annual withdrawal/diversion
Qi	authorized instantaneous withdrawal/diversion
Ranney Well	A shallow perforated pipe used to extract shallow ground water beneath a river bed
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RFP	Request for Proposals
RM	River Mile
SDWA	Safe Drinking Water Act
SEPA	State Environmental Policy Act
SIS	Summary Implementation Strategy
SOCs	Synthetic Organic Chemicals
SSA	Sole Source Aquifer
SWSL	Surface Water Source Limitation
SWSMP	Small Water System Management Program
SWTR	Surface Water Treatment Rule
TAG	Technical Advisory Group
TBD	To Be Determined
TSCA	Toxic Substances Control Act
TMDL	Total Maximum Daily Load
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Service
VOCs	Volatile Organic Chemicals
WMA	Watershed Management Act
WRATS	Water Rights Application Tracking System
WSDA	Washington State Department of Agriculture
WSU	Washington State University
WRIA	Water Resource Inventory Area
WSDA	Washington State Department of Agriculture
WSP	Water Supply Policy

Section 1

Introduction and Purpose

1.1 Plan Background and Overview

In 1998, the Washington State legislature adopted the Watershed Management Act (Chapter 90.82 RCW) and passed ESHB 2514, which provide local governments with the opportunity to develop long-term management plans that address water quantity, water quality, habitat and instream flows in local watersheds. RCW 90.82 states:

“The legislature finds that the local development of watershed plans for managing water resources and for protecting existing water rights is vital to both state and local interests. The local development of these 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 the watershed; and who have the greatest stake in the proper, long-term management of resources. The development of such 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. Therefore the legislature believes it necessary for units of local government throughout the state to engage in orderly development of these watershed plans.”

In response to ESHB 2514, the Initiating Governments¹ of Water Resource Inventory Area (WRIA) 27/28 established a 36-person Planning Unit representing a wide variety of interests, including counties, cities, citizens, water purveyors, agencies and other organized groups. In 2000, the Initiating Governments agreed by resolution to address all four planning elements (e.g., instream flows, water quality, habitat, and water supply), and selected the Lower Columbia Fish Recovery Board (LCFRB) to serve as the lead agency to receive and manage State grant money on behalf of the Planning Unit and to provide staffing and facilitation throughout the planning process. The WRIA 27/28 Planning Unit met on a monthly basis from 1999 through 2004, and during this period undertook an assessment of water resource conditions, commissioned a series of technical memoranda on water resource issues and solutions, and oversaw preparation of the WRIA 27/28 Salmon, Washougal and Lewis Watershed Management Plan (hereafter “Watershed Plan” or “Plan”).

The WRIA 27/28 Planning Unit approved the Watershed Plan on December 9, 2004. The Watershed Plan was forwarded to the Joint Legislative Authorities for adoption as prescribed in statute, and was subsequently remanded to the WRIA 27/28 Planning Unit

¹ WRIA 27 and 28 Initiating Governments include Clark, Cowlitz, Skamania and Yakima Counties; Cowlitz PUD; Clark Public Utilities; City of Vancouver; City of Woodland, the Chinook and Cowlitz Tribes, and the Yakama Nation. (Note: Yakima County has opted out of the process pursuant to RCW 90.82.130)

for revisions based upon recommendations presented by each of the counties in the planning area. In response to the remand, the Planning Unit developed recommended plan modifications and formally approved the revised Watershed Plan on July 13, 2006. On July 21, 2006, the Joint Legislative Authorities adopted the Watershed Plan by unanimous decision and directed the Planning Unit to proceed with preparation of a Detailed Implementation Plan (DIP) per the requirements of RCW 90.82.043.

1.2 Legislative Requirements for Detailed Implementation Plans (DIP)

1.2.1. DIP Development Process and Content

Chapter 90.82 of the RCW does not require planning entities to develop a Detailed Implementation Plan (DIP) as part of a watershed plan. However, in 2003 the Washington State Legislature amended the Watershed Planning grants program to provide Phase Four grants to support implementation of adopted watershed plans. The Legislature stipulated that entities that receive Phase Four grants must complete a DIP within one year of accepting the initial funding (RCW 90.82.043(1)). Submittal of a DIP to the Department of Ecology is also a condition of receiving grants for the second and all subsequent years of the Phase Four grant.

RCW 90.82.043 and .048 provide guidance to the WRIA 27/28 Planning Unit regarding DIP content and process. This statute specifies that the DIP must address the following elements:

- Strategies to provide sufficient water for production of agriculture, commercial, industrial and residential uses, and instream flows (See Watershed Plan Chapter 3);
- Timelines to achieve these strategies;
- Interim milestones to measure progress;
- Coordination and oversight responsibilities;
- Needed interlocal agreements, rules, ordinances, administrative approvals and permits;
- Consultation and coordination with other planning entities; and
- Funding mechanisms.

1.2.2. Inchoate Water Rights Assessment

The Phase Four requirements also address planning for “inchoate water rights”. Per RCW 90.82.048, the DIP:

“...must address the planned future use of existing water rights for municipal water supply purposes, as defined in RCW 90.03.015, that are inchoate, including how these rights will be used to meet the projected future needs identified in the watershed plan, and how the use of these rights will be addressed when implementing instream flow strategies identified in the watershed plan.”

In this DIP, the term “inchoate water rights” means those rights which are surplus to water demand as identified by the municipal water systems themselves through the water system planning process required by the Washington State Department of Health (DOH) under WAC 246-290. RCW 90.82.048 further requires that the timelines and interim milestones in a Detailed Implementation Plan address the planned future use of existing inchoate municipal water rights. Planning Units are called upon to describe how these inchoate rights will be used to meet the projected future needs identified in their respective watershed plans, and how the use of these rights will be addressed when implementing established instream flow strategies. Planning Units and lead agencies are required to ensure that holders of inchoate water rights are asked to participate in defining the timelines and interim milestones to be included in the DIP.

1.2.3 Habitat Elements

The Legislature also provided specific guidance for addressing the optional habitat element in plan development and implementation. If the initiating governments choose to include a habitat component, the watershed plan must be coordinated or developed to protect or enhance fish habitat in the management area. Such planning must rely on existing laws, rules, or ordinances created for the purpose of protecting, restoring, or enhancing fish habitat, including 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. Watershed planning 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 (ESA). The statute further requires that where habitat restoration activities are being developed under the Salmon Recovery Act (Chapter 77.85 RCW), such activities must be relied upon as the primary non-regulatory component for fish habitat within the watershed management plans. Section 8 below discusses how watershed planning and recovery planning in WRIA 27/28 have been integrated to create a single habitat restoration strategy in accordance with this guidance.

1.2.4 Research, Monitoring, Evaluation (RM&E) and Adaptive Management

The Legislature also provides guidance for monitoring activities related to detailed implementation plans. Specifically, the statute requires that in conducting assessments and other studies that include monitoring components or recommendations, the Planning Units must implement the monitoring recommendations developed under the Salmon Recovery Act (RCW 77.85.210).

As a Regional Recovery Region and Lead Entity under the Salmon Recovery Act, the LCFRB has been actively engaged with monitoring activities under RCW 77.55 and represents the statewide salmon recovery regions on the Governor’s Forum on Monitoring. As described in Section 10.8 below, the LCFRB has

developed a Research, Monitoring and Evaluation (RME) Program that integrates all monitoring activities related to implementation of the Watershed Plan, as well as the NOAA-approved Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan (LCFRB 2006), within the entire WRIA 25/26 and WRIA 27/28 planning area.

1.2.5 Coordination of Efforts

RCW 90.82.043 requires that in developing a detailed implementation plan, Planning Units must take steps to avoid duplicative or inconsistent activities. Specifically, Subsection 3 of the statute states the following:

“In developing the implementation plan, the planning unit must consult with other entities planning in the watershed management area and identify and seek to eliminate any activities or policies that are duplicative or inconsistent.”

This statute is designed to ensure that to the extent feasible, procedural and substantive requirements of the implementation plan are merged with related programs, so additional steps needed to implement the plan will be minimized. The Planning Unit has addressed this requirement using several approaches as described in the following sections.

1.3 DIP Organization and Relationship to Statutory Requirements

This DIP addresses the overall implementation requirements outlined in statute. This DIP builds upon existing requirements and guidance, as well as the recommendations provided in Section 8 of the adopted Watershed Plan, to create a coherent strategy for the coordinated implementation of water supply, stream flow management, surface water quality, ground water quality, and habitat actions. Many of the elements and statutory requirements cited above are already addressed in individual sections of the adopted WRIA 27/28 Watershed Plan. **To avoid duplication of information, some elements or requirements are therefore demonstrated as being met by referencing applicable sections of the Watershed Plan.** The following is an organizational summary for the remaining sections of this DIP:

- Section 2: Describes the DIP development and adoption process;
- Section 3: Provides the policy framework for DIP implementation actions;
- Sections 4-8: Summarize policies, recommendations and actions related to management of water supplies, instream flows, surface water quality, ground water quality, and fish habitat conditions;
- Section 9: Discusses general implementation considerations;
- Section 10: Describes research, monitoring, evaluation and adaptive Management;
- Section 11: Discusses future Watershed Plan updates; and
- Section 12: Discusses future DIP updates.

Section 2

DIP Preparation Process

2.1 Transition from Planning to Implementation

To provide a venue for Phase Four implementation activities, Section 8 of the Management Plan calls for the Planning Unit to transition from planning functions to coordination and oversight functions. For the Planning Unit to be effective in these functions, the Watershed Plan suggests establishing a core group of representatives from counties, cities, utility districts, agencies, and other Planning Unit entities that may elect to participate. Consistent with this recommendation, a Planning Unit Transition Subcommittee, staffed by the LCFRB, was formed upon adoption of the Watershed Plan in July of 2006.

Between July 2006 and February 2007, the WRIA 27/28 Planning Unit Transition Subcommittee prepared for transition into Phase Four. This group met on a monthly basis, and completed the following preliminary actions relating to Phase Four:

- Established guiding principles for development of the DIP (Appendix A);
- Established a mission statement for the Phase Four Planning Unit and realigned goals and objectives for planning and implementation (Appendix A);
- Reorganized the Planning Unit to oversee the implementation of Watershed Plan recommendations;
- Established ground rules and operating principles (Appendix A);
- Formed subcommittees (e.g., mitigation and rule-writing) to follow up on selected areas for implementation;
- Established the outline and framework for interlocal agreements that define oversight roles and responsibilities;
- Scoped management actions and established a framework and outline for preparation of a DIP (Appendix B);
- Established an electronic framework to assist with DIP development and implementation using the LCFRB's Salmon Partner Ongoing Recovery Tracking (Salmon PORT) system; and
- Worked with Ecology to ensure rule-making yields Washington Administrative Codes that are consistent with the intent of the Watershed Plan.

A substantial element of the Phase Four transition and reorganization involved a scoping process to refine Watershed Plan actions that are addressed in this DIP. This process included reviewing existing actions and recommendations, identifying emerging needs and considerations, and developing supporting subactions and tasks necessary to implement the Watershed Plan. Responsible organizations were tentatively identified, and actions were prioritized where needed based upon guidance developed by the Planning Unit Transition Subcommittee. Appendix B identifies the prioritized actions and subactions that are addressed in this DIP, along with the lead and support entities. **It is expected that lead and support entities and roles may be subject to refinement during Watershed Plan implementation.**

2.2 Planning Unit Reorganization

Upon completion of the Transition Subcommittee's work, the Planning Unit applied for and received Phase Four funds from Ecology for development of the DIP, which initiated the one-year completion timetable specified in statute. As recommended in the Watershed Plan, the LCFRB solicited the original Planning Unit membership and Transition Subcommittee for continued participation during Phase Four and the DIP preparation process. Of the original 33-member Planning Unit, 24 member groups opted to continue to participate at various levels during Phase Four. Membership included a broad cross-section of entities, including counties, cities, utility districts, Indian Tribes, environmental organizations, citizen representatives, and state and federal agencies. The Planning Unit met on a monthly basis throughout the DIP development process, and select subcommittees and work groups (e.g. Mitigation Subcommittee, Inchoate Workgroup, etc) met on a more frequent or as-needed basis.

2.3 Consultation with other Planning Entities

The Watershed Management Act requires that in developing the DIP, the Planning Unit must consult with other entities planning in the watershed management area and identify and seek to eliminate any activities or policies that are duplicative or inconsistent. The WRIA 27/28 Planning Unit has addressed this requirement using several approaches.

In reorganizing the Planning Unit for Phase Four, steps were taken to ensure the membership included those entities that are actively engaged in watershed planning and implementation activities within the watershed management area. Phase Four Planning Unit representation includes a broad cross-section of implementing entities, including cities, counties, utility districts, tribal interests, environmental organizations, state agencies (e.g., Ecology, Washington Department of Fish and Wildlife (WDFW)), and federal agencies (e.g., U.S. Forest Service).

The Planning Unit's adopted Phase Four operating procedures specify that these participants accept the responsibility of keeping their associates, organizations, and constituency informed of the Planning Unit's progress and issues under discussion. Each participant also accepts the responsibility of representing the needs and interests of their associates, organizations, or constituencies. Adequate time was provided prior to major decisions to allow participants to consult as needed, and strategic checkpoints were established to allow participants to review progress made and report back any concerns, potential inconsistencies or coordination needs to the group.

Coordination of efforts was also achieved through integrating watershed planning activities with salmon recovery activities. Early in the process, the Planning Unit elected to work collaboratively with the Lower Columbia Fish Recovery Board to integrate watershed planning with other planning efforts. This unique arrangement was significant to the lower Columbia Region because it ensured a high degree of interconnectedness between watershed planning, salmon recovery planning under the Endangered Species Act (ESA), and Fish and Wildlife Subbasin Planning under the

Northwest Power and Conservation Council's Fish and Wildlife Program. In particular, the habitat element of LCFRB's federally approved Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (2006) was developed using water quality, quantity and instream flow information from the Planning Unit's efforts, coupled with other habitat data and modeling efforts developed through the recovery planning process. The result is that Watershed Plan actions are highly integrated with, and complimentary to, those outlined in the federally approved Lower Columbia Salmon Recovery & Fish and Wildlife Subbasin Plan (LCFRB 2006).

While preparing the DIP, the Planning Unit also took steps to ensure that those entities that were not engaged in the process, but that would be directly affected by action implementation, were provided an opportunity to review and comment on draft documents related to the DIP. Copies of draft documents were provided to these entities along with a cover letter explaining the type of review needed and the process and timeline for providing comments. These entities were also invited to participate in monthly Planning Unit meetings to discuss any comments, recommendations or coordination needs. This process resulted in modification of several implementation actions to ensure accuracy and consistency with current planning and implementation efforts.

2.4 Action Schedule Development

One of the Planning Unit's primary tasks in preparing the DIP was to develop "Action Schedules" for each of the actions presented in the Watershed Plan, using a template prepared during the Phase Four transition period. For each implementation action outlined in the Watershed Plan, these Action Schedules describe the following:

- Lead, coordination and oversight organization(s)
- Action description
- Background and context
- Relationship to other actions
- Expected outcome(s)
- Supporting strategies and policies
- Supporting tasks, benchmarks, milestones and timelines
- Cost and funding
- Logistical needs
- Agreements, ordinances, permits and approvals
- Constraints and uncertainties

Sections 4 through 8 describe the various Watershed Plan Action Schedules related to water supply, instream flows, surface water quality, groundwater quality and habitat. Collectively, these Action Schedules are intended to serve as the framework for implementing the various Watershed Plan objectives, policies and recommendations in an integrated, coordinated, and efficient manner. Action Schedules are designed to provide implementing partners with general guidance for their associated actions, and identify the basic steps necessary to achieve them. They are intended to be specific

enough to identify a clear pathway for implementation, yet general enough to permit flexibility in carrying them out.

The Planning Unit recognizes that many DIP actions will require further investigation prior to full implementation, and that others will be contingent upon availability of funding and other resources. While specific tasks, benchmarks, milestones and cost estimates may need further refinement over time, it is expected that these Action Schedules will serve as the starting point for implementation.

2.5 Inchoate Water Rights Assessment

As discussed in Section 1.2.2, one of the statutory requirements relating to instream flow protection is to examine how development of existing, inchoate water rights held by municipal water suppliers could compromise stream flow management objectives and strategies. Work performed during previous planning phases and documented in the Watershed Plan already anticipated this need, and considerable effort was devoted to answering this question.

During development of the Watershed Plan, discussion with many of the key water purveyors identified the need to develop regional supplies in the lower portions of watersheds to meet long-term supply needs. In general, these discussions did not suggest an intent to develop significant inchoate water rights in flow-sensitive watersheds. While development of large inchoate rights may be legally permissible, it appears to be a relatively low risk based on information provided by these purveyors throughout the planning process. This is especially true in situations where annual quantity restrictions on water right permits are the primary factor limiting a purveyor's ability to pump water.

Sections 3 and 4 of the adopted Watershed Plan discuss existing and projected water supply needs by jurisdiction and watercourse, and present strategies and actions designed to ensure instream flow objectives are not compromised by expansion of water sources over the long-term. The various technical analyses used to support these strategies and actions are shown in Table 1. It is also important to note that technical analyses conducted in WRIA 27/28 were also used to inform development of the WRIA 25/26 Watershed Plan's water supply and instream flow strategies.

Table 1: Technical Memoranda Prepared During Planning Process

Assessment Phase: Level 1 Assessment⁽¹⁾	
Task 1A:	Water Quantity, Subtask 0100: Water Quantity Assessment and Subtask 0400: Streamflow Evaluation (June 2001)
Task 1A:	Water Quantity, Subtask 0200: Water Use Assessment (June 2001)
Task 1A:	Water Quantity, Subtask 0300: Water Rights Estimate and Subtask 0500: Stream Administrative Status (June 2001)
Task 1A:	Water Quantity, Subtask 0600: Hydraulic Continuity Evaluation (June 2001)
Task 1A:	Water Quantity, Subtask 0700: Seasonal/Cyclical Precipitation Analysis (June 2001)
Task 1A:	Water Quantity, Subtask 0900: Seasonal Water Balance (June 2001)
Task 1A:	Water Quantity, Subtask 0800: Land Use Evaluation (June 2001)
Task 1B:	Water Quality Assessment, Subtask 0100 Compliance with Standards; Subtask 0200: Pollution Sources; Subtask 0300: Pollution Impact Evaluation; Subtask 0400: Surface Water Mitigation Actions (June 2001)
Task 2:	Future Projections Analysis (June 2001)
Task 3:	Conclusions and Level II Recommendations (June 2001)
Assessment Phase: Level 2 Assessment	
TM No. 10 (Task 8A):	East Fork Lewis River Watershed Ground water/Surface-Water Relationships (PGG, 2003)
TM No. 11 (Task 8B):	Effect of Exempt Wells on Baseflow Washougal River Watershed (PGG, 2003)
TM No. 12 (Task 6):	Hydrologic Modeling of Effects of Land Use Changes WRIAs 27 and 28 East Fork of the Lewis River and Washougal River (PWR, Draft, December 2003)
Planning Phase⁽²⁾	
TM No. 1 (Task 2):	Assessment of Key Issues and Existing Plans for Major Water Users (August 2002)
TM No. 2 (Task 3):	Water Reclamation and Reuse Opportunities in WRIAs 27 and 28 (September 2002)
TM No. 3 (Task 3):	Comparison of Potential Water Supply Management Strategies (November 2002)
TM No. 4 (Task 5):	Instream Flow Conditions in Four Pilot Streams (Barber, December 2002)
TM No. 5 (Task 5):	Instream Flow Management Approaches in Four Pilot Streams (October 2002)
TM No. 6 (Task 7):	Ground water Development Scenarios (Kennedy-Jenks, November 2002)
TM No. 7 (Task 4):	Assessment of Priorities for Surface Water Cleanup Plans (TMDLs) (June 2003)
TM No. 8 (Task 5):	Strategies for Managing Flows in Two Pilot Subbasins (July 2003)
TM No. 9 (Task 10):	Management Actions to Protect Ground Water Quality (July 2003)
TM No. 13 (Task 4):	Surface Water Quality Monitoring Strategy for WRIAs 27 and 28 (Barber, May 2004)
TM No. 14 (Task 2-170):	Tidal Effects as Related to Stream Flow Protection Rule (December 2004)

TM = Technical Memorandum

⁽¹⁾ All Level 1 Assessment documents prepared by GeoEngineers⁽²⁾ All Planning Phase Technical Memoranda prepared by EES, except TM No. 4 and 13, prepared by Dr. Michael Barber; and TM No. 6 prepared by Kennedy-Jenks.

Given the detailed assessment of water supply and instream flow needs conducted in Phases 1, 2, and 3 of the planning process, the requirements of RCW.90.82.043 and .048 have already been largely met. The focus of the inchoate water rights assessment conducted as part of this DIP was therefore on determining whether previous research missed any major water rights that could compromise the established stream flow objectives and strategies. Because of the highly specialized nature of inchoate water rights assessments, the Planning Unit opted to hire a consulting firm, HDR Inc., to accomplish this task.

The Planning Unit coordinated closely with the consulting team to complete the inchoate water rights assessment consistent with statutory requirements. Completion of the assessment included the following basic steps:

- Data collection and preliminary municipal water rights screening;
- Develop a final water rights list for detailed inchoate assessment;
- Conduct detailed evaluation of selected water right permits;
- Solicit input from affected water right holders; and
- Develop any necessary recommended actions, timelines and milestones for inclusion in the DIP

The full report documenting the findings and recommendations of the inchoate water rights assessment is described in Appendix C below.

2.6 Mitigation Guidelines for Accessing Water Reserves

A key element necessary for the successful implementation of the Watershed Plan's "reserved water" approach is development of clear mitigation guidelines. Clear mitigation guidelines were deemed necessary to ensure that the balance between supply needs and instream flow protection is maintained as the Watershed Plan is implemented, and to improve predictability in permitting and decision-making. To be effective and supported by the implementing partners, the Planning Unit determined that the mitigation guidelines must be developed concurrent with, and as a component of, the DIP.

On behalf of the Planning Unit, the LCFRB contracted with HDR, Inc. to facilitate development of mitigation guidelines consistent with the water reservation strategy and recommendations outlined in the Watershed Plan. Because of similarities between the WRIA 27/28 and WRIA 25/26 Watershed Plans and the need to maintain regulatory consistency across Lower Columbia watersheds, the Planning Units agreed to develop a single strategy and guidelines that address both adopted plans. A Mitigation Subcommittee consisting of Planning Unit members from each WRIA and agency representatives was created and met with the consulting team on a monthly basis, reporting back to the broader Planning Units as needed. The Mitigation Subcommittee developed guidelines that address the following elements related to implementation of the Watershed Plan's reserved water strategy:

- Flow-Related Mitigation Actions
- Habitat Mitigation Actions
- Cost Considerations
- Mitigation Banking

The guidelines developed by the Mitigation Subcommittee translated the existing plan concepts and strategies into an operational guidance framework that will enable Ecology to process new water right applications in accordance with the Management Plans, while ensuring that unreasonable burdens on municipalities and other applicants

are avoided. Since the Watershed Plan's reserved water policies are intended to balance instream flow protection with water supply development needs, these operational guidelines are also designed to maintain this balance. It is expected that as additional funding becomes available in Phase Four, these operational guidelines will be expanded and refined. The Integrated Strategy for Implementing Water Rights Reservations (HDR and LCFRB, 2008) is presented in Appendix D.

2.7 DIP Adoption Process

RCW 90.82.1030 establishes a detailed process for development and formal adoption of watershed management plans. This process includes provisions for Planning Unit approval, remands, public notification and hearings, adoption by legislative authorities, and future revisions and modifications. The WRIA 27/28 Watershed Plan was adopted in July of 2006 following these existing requirements.

Although the State Legislature in 2003 established a fourth phase of planning, the "Implementation Phase", no procedural guidance or requirements were provided for formal adoption of a DIP. Absent statutory guidance, the Planning Unit developed the DIP following the same general procedures used for development of the original Watershed Plan. However, because the DIP only addresses those actions and recommendations previously adopted by the county legislative authorities and does not create additional or new obligations, formal adoption of the DIP by the counties is not required. The DIP was approved by the Planning Unit on June 9, 2008 using the consensus-based decision framework adopted for use in Phase Four.

Section 3

Policy and Strategy Framework

The specific actions and recommendations identified in the Watershed Plan and addressed in this DIP are derived from planning objectives adopted by the Planning Unit early in the planning process. Table 2 identifies the objectives that were used as a foundation for developing subsequent policy statements, recommendations, and actions in the Watershed Plan, as well as the DIP Action Schedules.

Table 2
Planning Objectives

I. Objectives for Protecting and Enhancing Watershed Conditions

- Effectively and efficiently manage water to ensure availability, reliability and predictability for beneficial uses over the long term, considering ongoing changes in population, local economies, and water-use technology.
- Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages.
- Protect surface water quality for designated uses, with an emphasis on protection of aquatic biota, including fish species in their various life stages.
- Protect surface and ground water needed for public drinking water supplies.
- Maintain productive habitat and enhance degraded habitat forming processes for indigenous fish species in all life stages.
- Protect and enhance wetlands and floodplains, with associated benefits for flows, water quality, ground water recharge and flood control.

II. Objectives for Developing and Implementing the Watershed Plan

- Manage water resources in a cost-effective manner, taking into account existing programs, potential partnerships, cost/benefit principles, and opportunities to achieve multiple objectives.
- Ensure strategies contribute to a healthy local and regional economy.
- Ensure the plan can be implemented through sustained support by local governments, state agencies, tribes, water-use interests and the public.
- Provide for extensive and meaningful public participation.
- Ensure fairness in distributing costs and burdens of water-resource management actions.
- Improve public understanding of water resources and encourage responsible stewardship.

III. Objectives for Improved Information and Data Management

- Improve the scientific basis for decision-making on water-resource issues, through sound data, accepted technical methods, and effective quality assurance/quality control protocols.
- Develop an effective adaptive management program, supported by long-term monitoring and ongoing developments in scientific understanding.

To achieve the objectives listed above, the Planning Unit carried out a detailed assessment of water resource conditions in WRIAs 27 and 28, and developed a wide-ranging set of policies and recommendations that address water supply, instream flow, surface water quality, ground water quality and fish habitat. These policies and recommendations, and the implementation actions derived from them are discussed further in the following sections.

Section 4

Implementation of Water Supply Strategies

4.1 Water Supply Policies and Recommendations

In developing the Watershed Plan, the Planning Unit placed a high priority on ensuring that the impacts of management actions upon water supplies and stream flows are considered together. The water supply implementation approaches were developed according to the following statements that characterize the Planning Unit's integrated vision for meeting water supply needs:

- Water supplies to meet future demand should avoid or minimize impacting stream flows;
- Regional supply options will be important in meeting future demand in Clark County; and
- If no practicable alternative to impacting stream flows exists, then off-setting activities must accompany new water rights

The water supply actions and recommendations outlined in the Watershed Plan are intended to strike a balance between providing new or expanded water supplies to meet growth needs, and protection of instream flows. The policies and related recommendations that form the basis for the management approach reflected in the DIP Action Schedules are presented in Table 3.

Table 3
WRIA 27/28 Water Supply Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy WSP-1 (Pg 3-10)	Access to water supplies	Public and private water users throughout WRIAs 27 and 28 should have access to water resources to meet new or expanded needs for water supply consistent with adopted land use plans.
Recommendation (Pg 3-13)	Water reservations	In order to satisfy the goals associated with the establishment of closures and/or instream flows, and the goals associated with providing a secure source of water for future public water supply, it is recommended that in each basin a block of water be reserved for future public water supply that would not be subject to the closures and/or instream flows established by rules for WRIAs 27 and 28.
Recommendation (Pg 3-15)	Regional water supply options – Columbia River	The Planning Unit views the Columbia River and ground water in hydraulic continuity with the Columbia River as a major water resource to meet water supply needs. As new water supplies are needed, it is preferable they be withdrawn from the Columbia River, adjacent lowland reaches of tributaries subject to tidal effects, and/or associated ground waters, rather than from flow-limited reaches of streams tributary to the Columbia. This approach can meet regional supply needs, while protecting important aquatic habitat in the region. The tidal reach of the mainstem Lewis River is an example of a source covered under this recommendation.
Recommendation (Pg 3-18)	Water supply – City of Vancouver	The Planning Unit endorses the City of Vancouver's plan to develop a new wellfield near Vancouver Lake. Permitting agencies should make every effort to facilitate the development of the Pleistocene Alluvial Aquifer and encourage its use over other sources.
Recommendation (Pg 3-19)	Water Supply – Clark Public Utilities	The Planning Unit endorses the development of the Vancouver Lake well field. CPU should consider sale of water from this supply source to other purveyors throughout Clark County, for use in meeting future demands. Permitting agencies should make every effort to facilitate the development of the Pleistocene Alluvial Aquifer and encourage its use over other sources.
Recommendation (Pg 3-14)	Vancouver Lake Wellfield - Relation to Remediation Activities at Port of Vancouver	A concern has been raised that development and pumping of the Vancouver Lake well field could inadvertently interfere with efforts to contain a contaminant plume underlying Port of Vancouver lands. CPU and the City of Vancouver anticipate working closely with the Port and environmental and health agencies to find a solution. Because of the regional importance of the ground water resource at Vancouver Lake, the Planning Unit recommends that all affected parties work together to create a solution that allows for development of this source of supply as quickly as possible.
Recommendation (Pg 3-19)	Water Supply – Clark Public Utilities	The Planning Unit endorses the development of additional wells in the Pioneer area to serve as a public water supply. The supply is subject to off-setting and habitat mitigating measures outlined in Section 3.3.1.
Recommendation (Pg 3-22)	Water supply – City of Washougal	The City of Washougal should follow procedures outlined in Section 3.3.1 as it relates to the installation of a new well near the center of town.
Recommendation (Pg 3-23)	Water supply – City of Woodland	The City of Woodland's Ranney Well is located within the tidal influence of the North Fork Lewis. The Planning Unit is not recommending protective measures in this reach. The Planning Unit supports expansion of the Ranney Well water supply.

Table 3 (Cont.)
WRIA 27/28 Water Supply Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Recommendation (Pg 3-23)	Water supply – City of Kalama	The Planning Unit endorses the City of Kalama's plans to increase water rights for withdrawal from its Ranney Well of up to an additional 1.92 cfs subject to provisions outlined in Section 3.3.1. The Planning Unit recognizes that the purchase of off-setting rights is not feasible in the Kalama River, and the 1.92 cfs of additional water rights is not subject to this provision; however, habitat mitigation requirements should be implemented commensurate with flow reduction impacts consistent with Section 3.3.1.
Recommendation (Pg 3-28)	Domestic wells (exempt wells)	Based upon the results of the analysis described in Section 3.5.2, and considering the relatively small amount of water withdrawals comprised by this category of water use, the Planning Unit recommends that a reservation of water be identified in rule language that provides for domestic well use, even within closed basins. However, this is not intended to promote use of domestic wells in lands zoned for urban densities. In addition, this recommendation is intended for areas served by septic systems that return water to the shallow ground water locally. Where homes are not served by septic systems, or where sewer service is extended to an area, extension of public water supply may be needed. This issue is discussed in greater detail in Section 4.3.2, which includes a stream flow management policy aimed at anticipating and mitigating water balance implications of extending sewer services to developing areas.
Recommendation (Pg 4-12)	Monitoring aquifer levels	The Planning Unit recommends a water-level monitoring program be developed for aquifers in the region. Details of this program will be developed during the implementation phase.
Recommendation (Pg 3-31)	Water supply – large industrial plants	Where feasible, industries requiring additional sources of supply in the future should connect to existing municipal water supplies. Where not feasible due to technical issues, logistics, or cost, then it is recommended that the industry evaluate alternative sources as described in Section 3.3.1.
Policy WSP-2 (Pg 3-10)	Stream flow protection in developing supplies	Water resource development to meet new or expanded needs should avoid or minimize effects on stream flows or aquatic habitat in stream reaches where flow conditions are an important factor for sustaining aquatic life, including fish populations in their various life stages.
Recommendation (Pg 3-11)	Procedure for Evaluating New or Expanded Supplies	It is recommended the procedure outlined in Section 3.31 be followed for municipalities requesting new or expanded water rights. This procedure involves evaluation of potential effects on stream flow and assessment of alternatives that could avoid impacts to stream flow. If the only feasible supply will affect stream flow, then off-setting and mitigating actions should be included in the water supply development proposal.
Recommendation (Pg 3-12)	Aquifer Mapping	The Planning Unit recommends that a map be developed during the implementation phase of the watershed planning process that would depict locations of deep aquifers suitable for water supply development. Such a map could be developed in partnership with the USGS, and will involve a study to identify aquifers that are not in hydraulic continuity with streams.

Table 3 (Cont.)
WRIA 27/28 Water Supply Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Recommendation (Pg 3-14)	Procedure for Evaluating Existing Supplies	For cases in which <i>existing</i> municipal supplies (as contrasted with planned <i>future</i> supplies) have the potential to negatively impact flows in critical stream reaches, the Planning Unit recommends that selected communities voluntarily consider enhancing their conservation efforts and undertake a review of alternative sources of supply, similar to that described in Section 3.3.1. It is recommended that, where feasible, these water suppliers cease or limit the use of certain existing supplies and develop alternative sources of supply that are less likely to impact flows in critical stream reaches. It is also recommended that implementation of such alternatives be eligible for funding from regional, state, or federal funding programs (see Section 3.6). This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State. Water suppliers in this situation should also consider availability of regional supplies (Section 3.3.3). It is important to note that existing municipal water rights are not subject to relinquishment if use of the rights ceases or is limited.
Recommendation (Pg 3-16)	New Developments and Industrial Suppliers	In general, the Planning Unit recommends that new urban or suburban developments or industrial facilities that require new or expanded water supplies shall seek to obtain water from existing municipal or other water suppliers rather than developing separate sources of supply. (Note: this would not apply to agricultural uses). If an existing municipal supplier or other water supplier is not available, then the new development or industrial facility should explore water supply sources that are not in hydraulic continuity with surface water or explore the feasibility of developing tidal and/or Columbia River sources. If none of these options are available, Ecology may consider issuing water rights that entirely off-set the net impact to stream flow.
Recommendation (Pg 3-19)	Salmon Creek Management Plan – CPU	The Planning Unit endorses CPU's current efforts regarding management of the Salmon Creek Basin.
Recommendation (Pg 3-20)	Surface water sources – Camas	Due to the impacts upon stream flows in Boulder and Jones Creeks of the City's surface water diversions, Camas should undertake a review of alternative sources of supply, similar to that discussed in Section 3.3.1. The City's existing plans for new ground water development near the Washougal River should be considered in this process, if the new wells are anticipated to not have negative impacts upon the river. If new water rights are secured by the City, the Jones and Boulder Creek sources should be retired, or used during periods of high flow only as a condition of the new water right. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-20)	Columbia River supply -- Camas	The Planning Unit recommends that the City re-evaluate development of a non-potable Columbia River supply, considering the substantial amount of water used for industrial purposes in the City. The Planning Unit commits to aiding the City in identifying and obtaining funding sources for implementation of such a project, most likely through programs administered by Ecology and DOH (see Recommendation in Section 8.3). This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-20)	Georgia Pacific Conservation efforts	The Planning Unit recommends that the City of Camas provide technical assistance and financial support to Georgia Pacific in developing water conservation measures that would reduce dependency on surface water from Lacamas Creek and ground water from the lower Washougal River vicinity. Any ground water savings realized through conservation could be available to help meet the City's growth needs. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.

Table 3 (Cont.)
WRIA 27/28 Water Supply Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Recommendation (Pg 3-27)	Water supply – small Group A systems	In those cases where new supplies are required for small Group A systems, it is recommended that a review of alternative sources of supply be conducted (see Section 3.3.1), with an emphasis placed upon evaluating the purchase of water from an existing major water purveyor (see Section 3.3.3). If new sources are required and a reserved block of water is not available, then the net impact to surface flows should be off-set by acquiring existing upstream water rights.
Recommendation (Pg 3-31)	Conservation and reuse – industrial needs	The Planning Unit places an emphasis upon water conservation and reuse with respect to industries with large water demands. Ecology and the Washington State Department of Health (DOH) should develop technical assistance and funding opportunities focused specifically upon the needs of self-supplied industries, to aid in reducing current water demands.
Recommendation (Pg 3-31)	Columbia River supply – industry	The Planning Unit recommends that large, self-supplied industrial water users evaluate development of Columbia River non-potable supplies, similar to that considered by the City of Camas. The Planning Unit commits to aiding industries in identifying and obtaining funding sources for implementation of such a project, most likely through programs administered by Ecology and DOH (see Recommendation in Section 8.3).
Recommendation (Pg 3-33)	New supply – agriculture	The Planning Unit does not endorse the use of surface water for meeting additional future agricultural water demand.
Recommendation (Pg 3-33)	Existing supply – agriculture	The Planning Unit encourages agricultural water right holders to request changes of existing surface water rights to ground water rights not in hydraulic continuity with surface waters. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-33)	Transfer of Agricultural Water Rights	Given the availability of existing water rights, the Planning Unit endorses the transfer of ground water rights from one user to another to meet future agricultural water demands. To promote the public interest, the Planning Unit encourages the Department of Ecology to expedite processing of agricultural ground water right transfers between agricultural water users.
Recommendation (Pg 3-33)	Agricultural – new ground water supplies	The Planning Unit recommends that Ecology process water right requests pertaining to future agricultural ground water demand, subject to consistency with the Planning Unit's water supply policy (Section 3.3.1) and successful completion of Ecology's water right application review process.
Recommendation (Pg 3-20)	Regional supply options– Camas	The Planning Unit recommends that the City of Camas evaluate regional supply options such as those discussed in Section 3.3.3. These include the development of a wellfield supply near the Steigerwald Wildlife Refuge or, if other opportunities prove infeasible, the potential purchase of water from Vancouver. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-21)	Conservation – Battle Ground	Battle Ground should enhance its current conservation efforts, with the goal of reducing the production required of existing wells. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 3-21)	Alternative sources – Battle Ground	Due to the potential for withdrawal from the City's existing wells to impact stream flows in the East Fork Lewis River and Salmon Creek, Battle Ground should undertake a review of alternative sources of supply, similar to that discussed in Section 3.3.1. The City's plans for a new well should also be subject to Section 3.3.1. Use of reclaimed water may also be of value. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-21)	CPU wholesale supply – Battle Ground	It is likely that new water supplies available to Battle Ground will have hydraulic continuity with the East Fork Lewis and Salmon Creek. Due to the regional significance of the East Fork Lewis to salmon recovery and foreseeable population growth, purchase of water from a CPU regional water source is critical. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.

Table 3 (Cont.)
WRIA 27/28 Water Supply Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Recommendation (Pg 3-22)	Stream Flow Augmentation – Battle Ground	The Planning Unit endorses the City of Battle Ground's efforts to develop a new wastewater treatment plant and to augment streamflows with Class-A Reclaimed water, provided water quality in receiving waters is also maintained or improved. The Planning Unit also supports consideration of mitigation credits for stream flow augmentation. Mitigation credits should reflect net stream-flow benefits in relation to withdrawal impact areas. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 4-48)	Salmon Creek MOU	The Planning Unit recommends that parties (i.e., Ecology, Clark County, and Clark Public Utilities) to the 1992 Salmon Creek MOU continue to implement the management plan. In addition, the parties to the MOU are encouraged to review the policies discussed in Sections 4.5 and 4.6 to assess whether additional stream flow management strategies are warranted in the Salmon Creek Subbasin.
Recommendation (Pg 3-22)	Regional supply options – Washougal	The Planning Unit recommends that the City of Washougal consider use of regional sources. These include the development of a wellfield supply near the Steigerwald Wildlife Refuge or, if other opportunities prove infeasible, the potential purchase of water from Vancouver. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-22)	Conservation – Ridgefield	Ridgefield should enhance its current conservation efforts, with the goal of reducing the production required of existing wells, to protect flows in Gee Creek. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 3-24)	Gee Creek Restoration – Ridgefield	The Planning Unit recommends that the City of Ridgefield coordinate with the Watershed Stewards Program to identify any actions it may take to aid in the Gee Creek restoration effort. If low flows are identified as an issue needing to be addressed, the City should undertake a review of alternative sources of supply, similar to that discussed in Section 3.3.1. The City's existing plans for new wells should be considered in this exercise, if the new wells are anticipated to have less of an effect upon stream flows than current sources. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Recommendation (Pg 3-24)	CPU wholesale supply – Ridgefield	The Planning Unit recommends that the City consider purchasing water from CPU to aid in meeting future demands, utilizing the recently installed fire flow intertie. This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.

4.2 Compliance with Statutory Requirements for Water Supply

RCW 90.82.043 requires that each DIP contain strategies to provide sufficient water for: production agriculture; commercial, industrial, and residential use; and instream flows. To address existing and future water supply needs, the Planning Unit commissioned numerous studies and analyses during Phases 1, 2, and 3 of the planning process to support development of strategies and actions for addressing water supply needs. Because of the interrelationships between water supply and instream flows, concurrent analyses were also conducted to characterize existing and future instream flow needs. Table 1 on page 2-5 summarizes the WRIA 27/28 Technical Memoranda (TM) related to water supplies and instream flows.

Because of the integrated relationship between water supply and stream flow, the impacts of management actions upon water supplies and stream flows must be considered together. Consistent with RCW 90.82.043, the Planning Unit therefore developed a balanced set of policies, strategies, recommendations and actions that ensure sufficient water is available for agricultural, commercial, industrial, and residential sectors, while protecting and enhancing instream flows. The reader is referred to Sections 2, 3, and 4 (and associated Appendices) of the adopted Watershed Plan for a more detailed discussion of the relationship between water supplies and instream flow protection, and how the requirements of RCW 90.82.043 have been addressed.

4.3 Water Supply Implementation Actions

Appendix E includes a comprehensive list of Action Schedules developed by the Planning Unit to implement the balanced water supply policies, strategies, recommendations and actions discussed above. These Action Schedules address a wide variety of activities, including the following:

- Development of new surface or groundwater supplies;
- Water conservation;
- Water reclamation and reuse;
- Expansion of existing sources;
- Voluntary transfers of water rights;
- Establishment of water reservations;
- Aquifer storage and recover; and
- Surface water storage.

These water supply actions have been designed to ensure sufficient water is available to meet existing and projected needs related to commercial, industrial, agricultural and residential uses, while protecting and enhancing instream flow conditions. Water supply actions should be reviewed jointly with the stream flow actions described in Section 5 and Appendix F, since they are closely interrelated.

4.4 Water Supply Implementation Considerations

Successful implementation of the water supply actions will require a long-term and coordinated effort by a wide variety of entities, including water purveyors, local governments, private entities, and state and federal agencies. To facilitate action implementation, the Watershed Plan identifies general considerations addressing action priority, lead and support roles, economic costs, and potential funding sources. Table 4 summarizes the generalized implementation considerations for the water supply recommendations discussed in this section, as well as Section 3 of the Watershed Plan.

Table 4
Implementation Considerations for Water Supply Actions

Priority ¹	Activity	Implementers ³	Financial/ Economic Costs ²	Potential Funding Sources
Category: Water Supply				
High	Public Water Systems develop new or expanded supplies. Requires engineering studies; approval of water system plan; water rights processing; other permitting; SEPA compliance; construction; operations & maintenance. Standard procedures exist for all of these.	<i>Lead:</i> Public Water System <i>Others:</i> DOH, Ecology	High	<i>Main:</i> Water rates and hookup charges in affected service areas <i>Additional:</i> Grants or low-interest loans from existing state & federal programs
High	Planning studies to explore alternative sources of supply to replace an existing source (selected communities).	<i>Lead:</i> Public Water System	Low	<i>Main:</i> Water rates in affected service area
High	Replace an existing source of supply with a different source to reduce impacts on stream flow. Requires engineering studies; water rights processing; other permitting; inter-local agreements or contracts; construction; operations & maintenance.	<i>Lead:</i> Public Water System <i>Others:</i> DOH, Ecology, adjacent water system(s) to serve as wholesaler	Medium to High	<i>Main:</i> Leg. appropriation <i>Additional:</i> Water rates in affected service area
Medium	Develop map of region's aquifers with emphasis on surface water hydraulic continuity.	<i>Lead:</i> Ecology <i>Others:</i> Public water systems	Medium	<i>Main:</i> Grants, water purveyor revenues
Medium	Enhanced conservation exceeding state requirements in selected communities.	<i>Lead:</i> Public Water System <i>Others:</i> Ecology, Conservation Districts	Low to medium	<i>Main:</i> public water system <i>Additional:</i> Grants from DOH or Ecology
Medium	Industrial supplies: Expand conservation & reuse; develop non-potable sources; connect to municipal systems.	<i>Lead:</i> Private industry (large plants) <i>Others:</i> Ecology & DOH (technical assistance; water rights processing if applicable)	Low to High (Varies by facility)	<i>Main:</i> Private industry <i>Additional:</i> Leg. appropriations

Table 4 (Cont.)
Implementation Considerations for Water Supply Actions

Priority ¹	Activity	Implementers ³	Financial/ Economic Costs ²	Potential Funding Sources
Low	Consider the effects of individual domestic wells when modifying or adopting comprehensive plans, zoning designations, or other land use regulations.	<i>Lead:</i> Counties, cities	Low	<i>Main:</i> counties, cities general fund or permitting fees, grants
Low	Agricultural supplies: switch from surface to ground water. Discourage new uses of surface water (use ground water instead).	<i>Lead:</i> Landowner <i>Others:</i> Ecology, Conservation Districts	Low to medium	<i>Main:</i> Landowner <i>Additional:</i> Leg. appropriations
Low	Develop water-level monitoring program for aquifers	<i>Lead:</i> Water purveyors <i>Others:</i> USGS, counties	Medium	<i>Main:</i> Grants, water purveyor revenues

⁽¹⁾ Priority in context of all actions in Watershed Management Plan.

⁽²⁾ Preliminary, generalized estimates of financial or economic cost to the community or water user involved. High: greater than \$500,000; Medium: \$50,000 to \$500,000; Low: less than \$50,000. Total cost, whether up-front or over a period of time up to ten years.

⁽³⁾ "Lead" implementer would take responsibility for organizing efforts under this action, including pursuing funding sources listed in the far right column.

Abbreviations: SEPA = State Environmental Policy Act, DOH = Department of Health, Leg. = Legislative

The above considerations are generic in nature and are intended to help focus efforts by identifying lead and support entities, prioritizing efforts, and identifying economic and funding considerations. To further refine and focus implementation efforts, the Planning Unit solicited more detailed information during development of the DIP (see Section 2.4). Where available, information on relationships between actions, expected outcomes, supporting tasks, benchmarks, cost, funding, regulatory considerations, constraints and uncertainties, and other considerations was included in each Action Schedule. Implementation considerations addressed in the water supply Action Schedules (Appendix E) may therefore be more detailed than those described in Table 4 above.

As shown in Table 4, a high priority and long-term consideration for implementation of water supply actions is development of regional water sources. The water supply actions described in this DIP identify the Columbia River, tidally influenced areas, and ground water in hydraulic continuity with the Columbia River as a major water resource to meet water supply needs. As new or expanded water supplies are needed, the Watershed Plan states that it is preferable they be withdrawn from these areas rather than from flow-limited reaches of streams tributary to the Columbia River. This approach can meet regional supply needs, while protecting important aquatic habitat in the region.

The general location of regional water sources is described in Sections 3 and 4, and Appendices H and J, of the adopted Watershed Plan. However, to provide predictability in future implementation, a more detailed description of the location and character of potential regional water sources is needed. To fill this information gap, the Planning Unit recommends that a map be developed during the early implementation phase that would depict the locations of tidally influenced and deep aquifers suitable for water supply development. In the interim, questions regarding the purpose, intent, and applicability of specific Watershed Plan recommendations relating to development of regional water sources should be directed to the WRIA 27/28 Planning Unit for clarification or guidance.

Section 5

Implementation of Instream Flow Strategies

5.1 Instream Flow Policies and Recommendations

Management of instream flows is a critical component of the Watershed Plan. Flows are an important determinant of habitat conditions for fish and other aquatic life in streams, and can be adversely affected by withdrawals for water supply and other human activities. The Planning Unit has placed a high priority on protection and enhancement of instream flows, and has established the following goal with regard to stream flow management:

“Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages.” (Watershed Plan, Section 4.1)

The instream flow policies and recommendations outlined in the Watershed Plan are intended to accomplish the above goal, while also providing for new or expanded water supplies to meet projected growth needs. To achieve this balance, Section 4 of the Watershed Plan presents the following policies and recommendations (Table 5) relating to implementation of instream flow strategies:

Table 5
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SFP-1 (Pg 4-11)	Flow monitoring	For purposes of improving stream flow management in the region, it is important that existing stream gauges be maintained over the long-term and that additional, permanent stream gauges be installed.
Recommendation (Pg 4-46, 4-58)	Stream gauges –Various rivers	The Plan recommends stream gauges be installed on the East Fork Lewis and Washougal Rivers.
Recommendation (Pg 4-43, 4-45, 4-56, 4-57)	Target Flows – East Fork Lewis River and Washougal River	For the main stem of the East Fork Lewis River and Washougal River, it is recommended that target flows be established for management purposes. Target flows should address both low flows and peak flows. The suite of flow-management techniques discussed for these streams should be designed with the goal of protecting these flows from degradation; and if possible improving the flow regime.
Recommendation (Pg 4-62)	Mitigation guidelines	The Department of Ecology should develop clear guidance for mitigation for use by water rights applicants. An existing Ecology document listing examples of mitigation can be used as a starting point.
Policy SFP-2 (Pg 4-19)	Restrictions on New Water Rights	The Department of Ecology should adopt State Rules (WACs) under its Instream Resources Protection Program to restrict issuance of new water rights in WRIAs 27 and 28. In all affected streams reaches a closure should be established, but with certain exceptions as indicated below. Existing water rights shall not be affected by this policy. For each stream that flows into the Columbia River, the zone where water levels are substantially affected by tidal influence and backwater from the Columbia River shall not be closed to issuance of new water rights. The location of the lower most extent of the closure is identified in this Plan. The rules adopted shall not prevent issuance of water rights for selected purposes and conditions. These include: • New uses for domestic wells, based on the amount of water required to meet estimated needs. This quantity represents the net depletion of stream flow in each subbasin by all domestic wells installed after the effective date of the rule; • New uses for small community systems and other beneficial uses, up to a predefined, limited “block” of water. These quantities represent the net depletion of stream flow in each subbasin for these categories of water use. Access to this block shall be granted only after consideration of items as listed for municipal systems, below. New uses for municipal water systems, based on the amount of water required to meet estimated needs. This quantity represents net depletion of stream flow in each subbasin. Access to this block should be granted only after consideration of practicable alternative supplies, demonstration of appropriate measures to ensure water-use efficiency, and consideration of requirements that offset and mitigate the depletion of stream flow or provide other types of aquatic habitat benefits. The Planning Unit supports consideration of mitigation credits for stream flow augmentation. Mitigation credits should reflect net

Table 5 (Cont.)
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SFP-2 (Pg 4-19) (Cont.)	Restrictions on New Water Rights (Cont.)	• stream-flow benefits in relation to withdrawal impact areas; • Use of a water right reservation is intended to occur within the same subbasin for which the reservation is designated. Exceptions are not encouraged unless it can be demonstrated that overall net benefits to instream flows in the affected subbasin would result. • Small, temporary uses of water for environmental restoration purposes not exceeding one year in duration. • Non-consumptive uses such as fish propagation or hydropower. • New uses limited to the high flow season, where the nature of the proposed use is such that water will not be taken in the low-flow season. However, this is not intended to allow withdrawals large enough to compromise habitat-forming processes of any stream. • The Planning Unit recommends that minimum instream flows be adopted as an additional element of the State Rules in selected basins where sufficient data is available. The minimum instream flows will be used in processing applications for changes or transfers of existing water rights. However, the blocks of water reserved for domestic, municipal, and other beneficial uses (see above) shall not be subject to minimum instream flow conditions. The Planning Unit recommends the rule be evaluated after Plan adoption, as the need is identified through the Plan review process outlined in Chapter 8; and that revisions to the rule be considered if needed. Increases to water supply reservations may be considered if compatible with aquatic habitat protection objectives. In addition, water reservation quantities may be shifted among water use categories to better address actual needs. However, the total reservation quantity in each subbasin shall not be decreased. Consistent with Chapter 90.82.130 any process to revise the rule should use a form of negotiated rulemaking that uses the same processes that applied in WRIAs 27 and 28 for developing this Watershed Management Plan. Rule review should consider a quantitative comparison between stream flows and population targets from the Salmon Recovery Plan developed by LCFRB. The Planning Unit does not intend for Ecology to defer processing of water rights, pending rule adoption.
Recommendation (Pg 4-62)	Mitigation guidelines	The Department of Ecology should develop clear guidance for mitigation for use by water rights applicants. An existing Ecology document listing examples of mitigation can be used as a starting point.

Table 5 (Cont.)
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SFP-3 (Pg 4-23)	Water Conservation	Water conservation is part of a sound comprehensive water resources management program. In general, adherence to State requirements for municipal water conservation, as modified from time to time, will be sufficient for most communities within WRIAs 27 and 28. Conservation activities that exceed state requirements should be carried out in selected communities where water use has the potential to cause significant impairment of stream flow conditions. Based on the Planning Unit's assessment of watershed conditions, these communities include Battle Ground, Ridgefield, Yacolt, and Camas (see Sections on East Fork Lewis River and Washougal River for further discussion of these communities). This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State. Water conservation actions by farmers practicing irrigated agriculture may be warranted in selected locations, where there would be significant benefits to stream flows. The Conservation District in each County should provide technical assistance to farmers to identify water conservation opportunities and funding sources.
Recommendation (Pg 4-54)	Camas - conservation	The City of Camas should enhance its existing conservation program to reduce water diversions from Jones and Boulder Creeks. However, if source substitution is pursued instead, this may be unnecessary. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 4-41)	Battle Ground, Ridgefield, Yacolt - conservation	The Cities of Battle Ground, Ridgefield, and Yacolt should enhance their existing water conservation programs to protect stream flows. This may be unnecessary, however, if source substitution is pursued instead (see below). This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Policy SFP-4 (Pg 4-25)	Short-Term Drought Response	Where major surface water diversions or ground water withdrawals have a direct effect on stream flows on a time scale of weeks or less, the water user should consider adopting voluntary procedures to alter operations in the event of a State-declared drought emergency affecting WRIAs 27 and/or 28. The water user should adopt policies and procedures in advance, to allow for quickly altering operations to minimize or eliminate the depletion of stream flow to the extent feasible in the event such a drought occurs. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State. For hydropower operations such as the Lewis River project, it is assumed that FERC license conditions fully address releases under low flow conditions, including drought conditions. Efforts should continue to identify small surface water users that could implement this type of management strategy to improve low flow conditions.

Table 5 (Cont.)
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Recommendation (Pg 4-54)	Camas – curtailment during drought	The City of Camas should develop a curtailment plan to reduce diversions from Jones and Boulder Creeks in the event of a state-declared drought emergency. (This approach would not be needed, if an alternative source is developed to replace these diversions.) This is a Planning Unit recommendation for voluntary action. Implementation should not be mandated by the State.
Policy SFP-5 (Pg 4-26)	Source Substitution	Communities using water sources (surface or ground water) that significantly reduce base flows in any stream that provides important fish habitat within WRIAs 27 and 28 should consider alternative sources of supply that eliminate or minimize these effects. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and evaluation of other feasibility criteria. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State. In limited cases, this policy may apply to rural areas where residents rely on domestic wells (exempt wells). When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, Clark and Cowlitz counties, cities, local governments, Ecology, and/or others as appropriate should assess this possibility through a water-balance analysis, in selected rural areas where extensive new development is expected to occur or where there is substantial existing development served by exempt wells. The intent is to explore solutions for small creeks where a large number of existing domestic wells may deplete stream flows. Under the right circumstances, if a different source could be used to replace individual wells, effects on stream flow could potentially be reduced or eliminated. Local community views should be included in this process.
Recommendation (Pg 4-41)	Battle Ground and Ridgefield– source substitution	The Cities of Battle Ground and Ridgefield should consider wholesale purchases of water from CPU to eliminate water-supply impacts on stream flow. This is preferred over water conservation, because of greater benefits to flow. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and other feasibility criteria. (Note: This recommendation is also stated in Section 3.4.) This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 4-55)	Camas – source substitution	The City of Camas should consider alternative sources of supply to reduce or cease use of surface water diversions on Boulder and Jones Creeks. Such alternatives include installation of new wells, purchases from City of Vancouver and development of non-potable source of supply. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and evaluation of other feasibility criteria. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 4-51)	Source substitution – Georgia Pacific Mill	Identify and carry out actions to reduce the impact of Georgia-Pacific's water use on Lacamas Creek. These actions may include a combination of source-substitution; water conservation; and/or water reclamation and reuse within the paper mill. The State of Washington should offer technical assistance for this purpose. In addition, the State of Washington should identify funding mechanisms that could, in part, contribute to reduction of water usage at the mill. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.

Table 5 (Cont.)
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SFP-6 (Pg 4-27)	Transfer of Water Rights to State Trust	Ecology should use its existing State Trust program, and funding provided by the State Legislature, to identify and acquire water rights from water users willing to sell or donate their water rights in WRIAs 27 and 28, where transfers to the State Trust would provide a significant benefit to fish habitat.
Recommendation (Pg 4-42)	Battle Ground, Ridgefield, and Yacolt – state trust water rights	If source substitution is pursued and if water rights are no longer needed for primary or backup supply, Battle Ground, Ridgefield, Yacolt and Camas should consider transferring water rights to the State Trust. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Recommendation (Pg 4-55)	Camas – state trust water rights	If the City of Camas reduces or eliminates diversions from Jones and Boulder Creeks, and if these water rights are no longer needed for primary or backup supply, they could potentially be transferred to the State Trust. This is a Planning Unit recommendation for voluntary actions. Implementation should not be mandated by the State.
Policy SFP-7 (Pg 4-27)	Enforcement, Unauthorized Uses	Ecology should conduct or support initial surveys in selected subbasins to determine whether unauthorized water uses are occurring on streams deemed critical to salmon recovery within WRIAs 27 and 28. If these surveys identify extensive unauthorized uses, they should be expanded to additional subbasins and carried out on a regular, periodic basis (e.g. once every five years). Where unauthorized uses are identified, Ecology should take enforcement actions to eliminate these uses. An alternative or additional approach would be the establishment of a watermaster that has regulatory authority to regulate illegal water diversions. Further development of this concept is recommended during the implementation phase.
Policy SFP-8 (Pg 4-28)	FERC License – Lewis River	The Planning Unit relies on the FERC licensing process to provide protections for flow and other habitat factors associated with hydroelectric facilities on the Lewis River.
Policy SFP-9 (Pg 4-29)	Forest Practices	The USFS, State DNR and private landowners should consider effects of forest management practices on stream flow and other fish habitat factors, in making forest management decisions. The Planning Unit anticipates that existing programs under the State's Forests and Fish regulations DNR's Habitat Conservation Plan, and the federal government's Northwest Forest Plan will provide the regulatory framework needed in this regard. The State and federal governments should monitor the effectiveness of these programs and periodically provide public documentation of their effectiveness in protecting fish habitat, including flow conditions, in WRIAs 27 and 28.

Table 5 (Cont.)
WRIAs 27/28 Stream Flow Policies and Recommendations

Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SFP-10 (Pg 4-30)	Stormwater Management	Clark County, Cowlitz County, and the Cities of Vancouver, Camas, Washougal, and Battle Ground should continue to carry out their legally mandated responsibilities with regard to stormwater management. The remaining cities in all three counties should review their stormwater management ordinances to determine whether they are adequately protective of fish habitat in local streams that may be affected by future development. Skamania County should voluntarily consider developing such an ordinance. Where enhanced stormwater management needs are identified, revisions to local ordinances should be considered in light of the guidance and BMPs provided in Ecology's Manual. The focus should be on upgrading development practices and mitigation requirements in areas where stream flow and fish habitat may be compromised as development occurs. Costs, expected magnitude of benefits, and feasibility considerations should be included in this review.
Policy SFP-11 (Pg 4-31)	Sewer Extensions	When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, jurisdictions should consider the water balance implications of allowing extension of sewer service to developing areas. The Planning Unit recognizes that provision of sewer service can provide substantial water quality benefits. However, where sewer service is extended to replace septic systems, and residents continue to rely on water wells, stream flows may be reduced. This effect should be anticipated and mitigated where applicable. This is particularly important in areas with relatively dense development near small streams.
Policy SFP-12 (Pg 4-32)	Floodplain Management	Within authorities, local jurisdictions and state agencies with land-management responsibilities should protect existing floodplains from modifications that would impair their hydrologic functions and habitat value. Local jurisdictions and state agencies with land-management responsibilities should identify floodplain restoration projects, subject to local input, cost-benefit analysis, and availability of funding. Where these factors are favorable, and where substantial benefits to flow or other habitat factors are identified, these projects should be pursued for implementation.
Policy SFP-13 (Pg 4-33)	Wetlands Management	In conjunction with the Planning Unit, Counties should explore funding opportunities for conducting a county-wide wetland assessment that includes evaluation of hydrological functions. Counties should also require evaluation of hydrological function as part of any site-specific wetland assessments conducted under their critical areas, wetland or other land use ordinances. Their wetlands ordinances should be modified as needed to include hydrologic functions in the wetland protection hierarchy. Counties should review and consider strengthening mitigation ratios, for selected wetland areas that offer significant hydrologic functions or other fish habitat benefits.
Recommendation (Pg 4-33)	Other activities affecting shallow aquifer interactions	Evaluate the need to take additional actions to prevent disruption of shallow aquifer recharge, subsurface flow patterns, and aquifer discharge that support the stream flow regime in low flow periods.

5.2 Stream Flow Implementation Actions

Appendix F includes a comprehensive list of Action Schedules developed by the Planning Unit to implement the balanced stream flow policies, strategies, recommendations and actions discussed above. These Action Schedules address a wide variety of activities, including but not limited to the following:

- Water supply source substitution;
- Restrictions on issuance of new water rights;
- Establishment of instream flows;
- Water conservation;
- Enforcement against unauthorized water uses;
- Transfers of water rights to State Trust;
- Establishment of a target flow program; and
- Implementation of a variety of land use practices (e.g., stormwater practices, forest practices, floodplain management, etc) designed to implement Watershed Plan goals, objectives, and strategies.

In addition to the above, implementation of the mitigation guidelines developed for the Watershed Plan's reserved water strategy (See Section 2.6) will involve a variety of actions designed to maintain or improve stream flows. Flow related actions identified to offset stream flow depletion include but are not limited to acquisition and retirement of active upstream water rights, and direct flow augmentation measures. Habitat related mitigation actions include side-channel/off-channel habitat restoration, instream channel improvements, wetland and riparian restoration, floodplain reconnection, and other projects that directly or indirectly mitigate for stream flow depletion. Mitigation banking has also been identified as a tool to help focus and leverage benefits related to both flow and habitat mitigation actions. A detailed description of the Integrated Strategy for Implementing Water Rights Reservations (HDR and LCFRB 2008) and associated stream flow actions is provided in Appendix D.

The stream flow actions outlined in this DIP have been designed to protect and enhance instream flow conditions while ensuring sufficient water is available to meet existing and projected needs related to commercial, industrial, agricultural and residential uses. Stream flow implementation actions should be reviewed jointly with the water supply actions described in Section 4.0 and Appendix E, since they are closely interrelated.

5.3 Stream Flow Implementation Considerations

Table 6 summarizes the general implementation considerations for the stream flow management actions discussed in Section 4 of the Watershed plan and addressed in this DIP. Related implementation considerations addressing water conservation and substitution of water sources were presented in Section 4 of this DIP and are not repeated here.

Table 6
Implementation Considerations for Stream Flow Management Actions

Priority ⁽¹⁾	Activity	Implementers ^{(3) (4)}	Financial/ Economic Costs ⁽²⁾	Funding Sources
High	Maintain existing stream gauges. Install new gauges at selected locations. Select exact sites; permit and construct gauges; O&M; data management.	<i>Lead:</i> Ecology <i>Others:</i> USGS, LCFRB, Counties	Medium	<i>Main:</i> Leg. appropriations (Ecology budget); Congr. appropriations (USGS budget); <i>Additional:</i> Counties; Public Water Systems
High	Adopt State Rule restricting issuance of new water rights in accordance with Policy SFP-2 as described in this Plan.	<i>Lead:</i> Ecology <i>Others:</i> LCFRB	Low	<i>Main:</i> Ecology (staff time) <i>Additional:</i> LCFRB (staff time)
High	Selected actions involving water supply. See Section 3.6.	<i>See Section 3.6</i>	<i>See Section 3.6</i>	<i>See Section 3.6</i>
High	Establish target flow monitoring and management program	<i>Lead:</i> LCFRB and Planning Unit or successor organization <i>Others:</i> Ecology, DFW		<i>Main:</i> Phase 4 implementation funds <i>Additional:</i> TBD
High	Initial surveys in selected subbasins to identify unauthorized uses and take enforcement actions. Follow-up in other basins if warranted.	<i>Lead:</i> Ecology <i>Others:</i> N/A	Low to medium	<i>Main:</i> Leg. appropriations (Ecology budget & staffing) <i>Additional:</i> N/A
High	Consider and address effects of forest practices on stream flow. Monitor effectiveness of F&F Rules and NW Forest Plan. Report to public periodically.	<i>Lead:</i> DNR, USFS <i>Others:</i> Private forest landowners	Low to medium	<i>Main:</i> Leg. appropriations (DNR budget); Congr. appropriations (USFS budget), Timber producers <i>Additional:</i> N/A
High	Within authorities, protect floodplains from modifications that would impair hydrologic functions or habitat.	<i>Lead:</i> Counties, cities, State agencies with land management responsibilities <i>Others:</i> DFW	Low	<i>Main:</i> County permitting fees or general fund revenues, grants <i>Additional:</i> State agency budgets
Medium	Review effects of stormwater discharges on stream flow and habitat. Where needed to protect key habitat, implement programs that exceed minimum requirements.	<i>Lead:</i> Counties, Cities <i>Others:</i> Ecology	Low to Medium	<i>Main:</i> County, City general funds; Stormwater assessment and fees, grants <i>Additional:</i> N/A
Medium	Purchase or lease of water rights from willing sellers, for State Trust program.	<i>Lead:</i> Ecology <i>Others:</i> N/A	Low to medium	<i>Main:</i> Leg. appropriations (Ecology budget) <i>Additional:</i> N/A

Table 6 Continued
Implementation Considerations for Stream Flow Management Actions

Priority ⁽¹⁾	Activity	Implementers ^{(3) (4)}	Financial/ Economic Costs ⁽²⁾	Funding Sources
Medium	Within authorities, identify floodplain restoration projects and implement where feasible.	<i>Lead:</i> Cities, State agencies with land management responsibilities, Conservation Districts, Non-Profits <i>Others:</i> DFW, Ecology, Counties	Medium to High	<i>Main:</i> State or federal grants; Leg. appropriations <i>Additional:</i> N/A
Medium	Large water users and hydropower facilities: short-term drought response curtailment programs, to protect stream flows.	<i>Lead:</i> Selected public water systems; hydropower operators <i>Others:</i> N/A	Low to medium	<i>Main:</i> Large water users and hydropower facilities <i>Additional:</i> N/A
Medium	Evaluate the need to take additional actions addressing shallow aquifer interactions.	<i>Lead:</i> Planning Unit or successor organization <i>Others:</i> N/A	Low	<i>Main:</i> Phase 4 implementation funds <i>Additional:</i> TBD
Medium	Develop clear guidance for mitigation.	<i>Lead:</i> Ecology <i>Others:</i> N/A	Low	<i>Main:</i> Leg appropriations (Ecology budget) <i>Additional:</i> N/A
Medium	Wetlands inventories and ordinances: assess and protect hydrologic functions, consider strengthening mitigation ratios.	<i>Lead:</i> Counties and Planning Unit <i>Others:</i> N/A	Medium	<i>Main:</i> County development fees or general fund revenues (note staffing impact), grants <i>Additional:</i> N/A
Low	When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, consider the water balance implications of allowing extension of sewer service to communities formerly served by septic systems.	<i>Lead:</i> Counties, Cities <i>Others:</i> Sewer agencies if different from Counties, Cities.	Low	<i>Main:</i> Counties, Cities general funds, permitting fees, grants <i>Additional:</i> N/A

Table 6 Continued
Implementation Considerations for Stream Flow Management Actions

Priority ⁽¹⁾	Activity	Implementers ^{(3) (4)}	Financial/ Economic Costs ⁽²⁾	Funding Sources
Low	Water conservation by farmers practicing irrigated agriculture. Technical assistance by Conservation District in each county.	<i>Lead:</i> Agricultural producer <i>Others:</i> Conservation Districts	Medium	<i>Main:</i> Agricultural producer <i>Additional:</i> Leg. Appropriations (Cons. Commission & CD budgets).
Low	Source substitution for selected areas served by domestic wells: relatively higher densities and likelihood of stream impacts; dependent on feasibility and cost.	<i>Lead:</i> Counties <i>Others:</i> Public water systems, landowners	Medium to high	<i>Main:</i> Assessments on affected properties (local improvement districts), grants <i>Additional:</i> Federal and State salmon recovery funding; Leg. appropriations

⁽¹⁾ Priority in context of all actions in Watershed Management Plan.

⁽²⁾ Preliminary, generalized estimates of financial or economic cost to the community or water user involved. High: greater than \$500,000; Medium: \$50,000 to \$500,000; Low: less than \$50,000. Total cost, whether up-front or over a period of time up to ten years.

⁽³⁾ "Lead" implementer would take responsibility for organizing efforts under this action, including pursuing funding sources listed in the far right column.

Abbreviations: SEPA = State Environmental Policy Act, DOH = Department of Health, Leg. = Legislative, Congr. = Congressional

The above considerations are generic in nature and are intended to help focus efforts by identifying lead and support entities, prioritizing efforts, and identifying economic and funding considerations. To further refine and focus efforts, the Planning Unit solicited more detailed information during development of the DIP (see Section 2.4). Where available, information on relationships between actions, expected outcomes, supporting tasks, benchmarks, cost, funding, regulatory considerations, constraints and uncertainties, and other considerations was included in each Action Schedule. Implementation considerations addressed in the stream flow Action Schedules (Appendix F) may therefore be more detailed than those described in Table 6 above.

Section 6

Implementation of Surface Water Quality Strategies

6.1 Surface Water Quality Policies and Recommendations

The WRIA 27 and 28 Planning Unit has identified protection and improvement of surface water quality as an important objective linked to the Watershed Plan. From an implementation perspective, the Planning Unit recognizes that programs already exist to protect and improve water quality, and it is neither desirable nor consistent with RCW 90.82.043 to duplicate these programs. The primary vehicle for achieving compliance with state criteria for surface water quality is the Washington State Department of Ecology's (Ecology) Total Maximum Daily Load (TMDL) program, also known as "water cleanup plans". In an effort to ensure that all waters of the state meet or exceed designated water quality standards, Ecology is engaged in a long-term process to develop water cleanup plans by assessing sources of water quality impairment and developing implementation measures to reduce pollutant loading. The following surface water quality policies and recommendations (Table 7) reflect the Planning Unit's agreement to rely upon Ecology's TMDL program as the primary means to implement water quality actions in WRIAs 27 and 28.

Table 7 WRIA 27/28 Surface Water Quality Policies and Recommendations		
Watershed Plan Reference and Location	Issue	Policy or Recommendation
Policy SWQ-1 (Pg 5-1, 5-9)	TMDLs	The Washington State Department of Ecology's program to set Total Maximum Daily Loads (TMDLs) for water bodies that do not meet state water quality standards is the primary vehicle for addressing water quality at the regional scale.
Recommendation (Pg 5-11)	TMDLs	The Planning Unit recommends that Ecology develop TMDLs according to the priority list shown in Table 5-3. At such time as the 2002/2004 303(d) list is approved by Ecology and EPA, these priorities should be revisited.
Recommendation (Pg 5-17)	Assessment of Sources of Impairment	It is recommended that a detailed assessment strategy be developed for WRIAs 27 and 28 to identify sources of water quality impairment (specific sites or areas). Following completion of the strategy, it is recommended that funds be sought to carry out this assessment and take corrective actions where needed.

The Planning Unit also determined that it would be valuable to provide guidance to Ecology in terms of prioritizing implementation actions relating to water cleanup plans. The Planning Unit's recommended TMDL implementation priorities are summarized in the following table, and are intended to guide Ecology in their implementation actions:

Table 8
Summary Recommendations to Prioritize Cleanup Plans in WRIAs 27 and 28

Priority for Cleanup Plan (TMDL)	Water Quality Impaired Sub-basin	Basis for Prioritization
1 st	East Fork Lewis River	Significant development anticipated Water quality threatens listed salmon species Potential human health impacts from contact recreation
2 nd	Salmon Creek*	Significant development anticipated Water quality threatens listed salmon species Potential human health impacts from contact recreation
3 rd	Lacamas Creek	Significant development anticipated Potential human health impacts from contact recreation Potential fisheries impact below dam
4 th	Burnt Bridge Creek	Programs in place to address water quality impacts for Burnt Bridge Creek
5 th	Kalama River	Limited temperature impairments in Kalama River

These TMDL priorities are interim, and are intended to be revisited during the implementation phase, as the 303d list is updated by Ecology and EPA.

To support implementation of effective surface water quality actions, the Planning Unit recommends implementation of a water quality monitoring program in WRIAs 27 and 28. The proposed Water Quality Analysis Plan (WQAP) (Barber 2004, Technical Memorandum No. 13, Appendix L) would monitor core water quality information related to flow, temperature, nutrients, and several other parameters at as many as 28 stream segments (not all parameters measured at each segment). The types of monitoring objectives that the WQAP would address are those concerned with baseline information and background information for identifying long-term trends. The WQAP recommendations have been integrated into the LCFRB's draft integrated Research Monitoring, and Evaluation (RME) Program (2008), as described in Section 10.8.

The Planning Unit also recommends that a detailed assessment strategy be developed for WRIAs 27/28 during the implementation phase. The purpose of the assessment strategy is to obtain information on specific sources of non-point source pollution, so they can be targeted for action. Once sites or areas are identified in each subbasin, follow-up actions can be defined, such as outreach and technical assistance to landowners; specific projects to eliminate or control sources; or, where appropriate, enforcement actions. The following steps are recommended to implement the assessment framework:

1. Identify and prioritize target activities or conditions, by subbasin;
2. Define metrics and techniques for gathering information on each target activity or condition;
3. Perform field work or other activities to gather information as defined;
4. Evaluate results;
5. Define and carry out follow-up actions to correct problems identified.

6.2 Surface Water Quality Implementation Actions

The surface water quality recommendations and actions described in this section include prioritized implementation of TMDLs, implementation of a water quality monitoring program, and development of a detailed full-scale assessment for non-point sources of impairment and correction of identified problems. Appendix G describes Action Schedules developed by the Planning Unit to implement the above Watershed Plan policies, strategies, recommendations and actions relating to surface water quality.

6.3 Surface Water Quality Implementation Considerations

Table 9 summarizes implementation considerations for the surface water quality recommendations discussed in Section 5 of the Watershed Management Plan. Where available, more detailed information relating to implementation considerations was included in specific surface water quality Action Schedules.

Table 9 Implementation Considerations for Surface Water Quality Actions				
Priority⁽¹⁾	Activity	Implementers^{(3) (4)}	Cost⁽²⁾	Funding Sources
Category: Surface Water Quality				
Medium	Develop water body cleanup plans (TMDLs) for subbasins, in prioritized sequence as indicated in Watershed Management Plan. Carry out necessary modeling, reporting, public involvement, and waste load allocations.	<i>Lead:</i> Ecology <i>Other:</i> Local governments, Conservation Districts, other interested parties	High	<i>Main:</i> Leg. appropriations (Ecology budget) <i>Additional:</i> N/A
Medium	Within authorities, develop full scale assessment strategy for non-point sources	<i>Lead:</i> counties <i>Other:</i> Ecology, conservation districts, USFS, DNR	Low	Phase 4 implementation Grant
Medium	Within authorities, carry out source assessment of non-point sources	Same as above	Medium	TBD, (combination of State, federal, and local sources)
Medium	Actions to correct sources of impairment	<i>Lead:</i> Party causing impairment <i>Other:</i> Ecology, conservation districts	Medium to High	TBD (combination of State, federal, local and private source)
Low	Expand water quality monitoring activities to improve understanding of status and trends. Install monitoring equipment; collect and analyze samples; manage and analyze data; report results.	Shared efforts by State, local, federal agencies. Ecology will take lead on promoting cooperative arrangements among agencies.	High	Combination of State, local, federal funding sources (to be developed further in Implementation Phase)

- (1) Priority in context of all actions in Watershed Management Plan.
- (2) Preliminary, generalized estimates of financial or economic costs to the affected community, implementing organization or water user. High: greater than \$500,000; Medium: \$50,000 to \$500,000; Low: less than \$50,000. Total cost, whether up-front or over a period of time up to ten years.
- (3) "Lead" implementer would take responsibility for organizing efforts under this action, including pursuing funding sources listed in the far right column.
- (4) Lead and support roles will vary depending on jurisdiction and geographical area.

Abbreviations: TMDLs = Total Maximum Daily Loads, N/A = Not Applicable, Leg. = Legislative, TBD = To be developed

Funding has not yet been secured for implementation of the LCFRB's RME Program. However, as part of the planning process, the Planning Unit has estimated costs associated with implementation of the WQAP elements of the program. Estimated costs include upfront equipment and installation costs, and annual sample analysis and coordination costs. The estimated upfront equipment costs of the WQAP are \$65,650, and the annual implementation cost is \$154,650. The total first year cost for the WQAP is \$214,600. This cost could potentially be reduced if volunteers were used to collect samples. However, use of volunteers does not always reduce costs, due to the need for ongoing training and logistical requirements to maintain a fixed monitoring program. Annual data processing and data management costs were not included in the budget. This plan assumes that a half-time staff person would be hired in order to coordinate monitoring activities. These implementation costs were estimated during Phase 3, and should be adjusted for inflation when WQAP program funding is solicited.

Section 7

Implementation of Ground Water Quality Strategies

7.1 Ground Water Quality Policies and Recommendations

Given the importance of ground water supplies to the more populous areas of WRIA 27 and 28, the Planning Unit has identified groundwater protection as an important objective of the Watershed Plan. The following general management goals provide the basis for the ground water management strategies outlined in Section 6 of the Watershed Plan:

- Prevent future impacts to clean ground water supplies;
- Prevent further degradation of currently impacted ground water supplies; and
- Clean up impacted ground water supplies.

Based on these general goals, the Planning Unit recommended the following five general management objectives for management of ground water resources:

- Improve public understanding and awareness of issues related to drinking water quality;
- Assess susceptibility of ground water supplies to contamination on a regional basis;
- Improve local wellhead protection programs;
- Implement management strategies to minimize impacts of land use activities on ground water supplies; and
- Clean up ground water contamination.

A detailed description of each of these recommended management objectives, its purpose, rationale and relationship to other objectives is found in Section 6.5 of the Watershed Plan.

7.2 Ground Water Quality Implementation Actions

For each of the five management objectives described above, the Planning Unit has identified specific actions for implementation. These implementation actions are described in Sections 6.5.1 through 6.5.5 of the Watershed Plan, and form the basis for the ground water quality Action Schedules presented in Appendix H.

7.3 Ground Water Quality Implementation Considerations

The Watershed Plan presents both general and specific implementation considerations for ground water protection actions. Table 10 summarizes general implementation considerations applicable to broad categories of management activities, whereas Table 11 describes action-specific considerations. Where available, additional information on relationships between actions, expected outcomes, supporting tasks, benchmarks, cost, funding, regulatory considerations, constraints and uncertainties, and other

considerations were also included in each Ground Water Quality Action Schedule. Implementation considerations addressed in the ground water Action Schedules (Appendix H) may therefore be more detailed than those described below.

Table 10				
General Implementation Considerations for Ground Water Quality Actions				
Priority⁽¹⁾	Activity	Implementers⁽³⁾	Cost⁽²⁾	Funding Sources
Category: Ground Water Quality				
High	Improve public awareness of ground water quality issues. Information outlets. Mass-media campaign. Schools program. Public opinion surveys.	<i>Lead:</i> County health departments <i>Others:</i> Cities, DOH.	Medium	<i>Main:</i> TBD Substantial staffing needs <i>Additional:</i> TBD
High	Assess susceptibility of ground water supplies to contamination. Risk assessment. Evaluate data management and improve if necessary. Regional mapping.	<i>Lead:</i> County health departments <i>Others:</i> Cities, Ecology, DOH.	Low to Medium	<i>Main:</i> TBD Substantial staffing needs <i>Additional:</i> TBD
Medium	Improve local wellhead protection. Determine which Group A Systems have wellhead program. Apply technical assistance and enforcement to meet state requirements. Facilitate use of computer modeling. Encourage Group B systems to voluntarily establish wellhead programs.	<i>Lead:</i> DOH and County health departments <i>Others:</i> Public water systems	Medium to High	<i>Main:</i> TBD Substantial staffing needs <i>Additional:</i> TBD
Low	Minimize impacts of land use activities on ground water supplies, through technical management strategies. Identify land uses and activities needing attention. Select and implement strategies to prevent impacts to ground water quality.	<i>Lead:</i> County health departments <i>Others:</i> County planning departments, conservation districts, Ecology, Wash. Dept. of Agriculture, NRCS	Medium to High	<i>Main:</i> TBD Substantial staffing needs <i>Additional:</i> TBD
Low	Clean up sources of ground water contamination. Evaluate need for greater involvement by local organizations. Evaluate need for independent cleanup actions outside Ecology programs.	<i>Lead:</i> County health departments <i>Others:</i> Ecology, Public Water Systems, Wash. Dept. of Agriculture	Medium to High	<i>Main:</i> TBD <i>Additional:</i> TBD

⁽¹⁾ Priority in context of all actions in Watershed Plan. See section 6.6.3 of the Watershed Plan for a more detailed description of objective priorities.

⁽²⁾ Preliminary, generalized estimates of financial or economic costs to the affected community, implementing organization or water user. High: greater than \$500,000; Medium: \$50,000 to \$500,000; Low: less than \$50,000. Total cost, whether up-front or over a period of time up to ten years.

⁽³⁾ "Lead" implementer would take responsibility for organizing efforts under this action, including pursuing funding sources listed in the far right column. Agency lead roles may vary depending on authorities (see Section 8.5).

Abbreviations: NRCS = Natural Resources Conservation Service, DOH = Department of Health, TBD = To Be Developed.

Table 11 Implementation Considerations for Specific Ground Water Quality Actions					
Action	Proposed Agency Involvement⁽¹⁾	Staff Resources Required⁽²⁾	Initial Implementation Cost⁽³⁾	Short-term Benefit	Long-term Benefit
1A. Provide outlets for ground water protection information	County health department Conservation districts Water purveyors	Medium	Medium	X	X
1B. Develop a mass media campaign for ground water protection	County health department Conservation districts	High	Medium	X	
1C. Develop a ground water protection program for schools	County health department Conservation districts School districts	High	Medium	X	X
1D. Conduct periodic public opinion surveys related to ground water protection efforts	County health department Conservation districts	Medium	Medium	X	
2A. Conduct Level I Risk Assessment	County health department County planning department Ecology DOH Local water purveyors	Medium	Medium	X	
2B. Evaluate existing data management system and improve if necessary	County health department	Low to Medium	Low	X	X
2C. Produce regional maps showing results of risk assessment	County health department County planning department Local water purveyors	Low	Low	X	
3A. Enforce Wellhead Protection Program requirements for all Group A PWSS	DOH Local water purveyors (Group A)	Low	Low to Medium	X	
3B. Facilitate use of a computer model for delineating select Group A PWS wellhead protection areas	DOH Local water purveyors (Group A) USGS County health department	High	High	X	X

Table 11
Implementation Considerations for Specific Ground Water Quality Actions

3C. Encourage Group B PWSs to voluntarily establish a Wellhead Protection Program	<i>County health department</i> Local water purveyors (Group A) WSU Cooperative Extension	Low to Medium	Medium	X	X
4A. Coordinate and promote management strategies	<i>County health department</i> Ecology Conservation districts WSDA NRCS	High	High	X	X
5A. Evaluate the need for greater involvement as a stakeholder in clean up actions at Ecology regulated facilities and sites	<i>County health department</i> Ecology Local water purveyors	Medium	Low		X
5B. Evaluate the need for independent clean up actions	<i>County health department</i> Ecology WSDA	High	High	X	X

(1) The proposed lead agency is shown in italics. Agency lead roles may vary depending on authorities (see Section 8.5). Other listed agencies may support the lead agency with data and/or resources. Interagency agreements may be a vehicle for promoting cooperation.

(2) Low = Need $\frac{1}{4}$ to $\frac{3}{4}$ fulltime equivalent (FTE) to implement. Medium = Need 1-2 FTE to implement. High = Need > 2 FTE and/or contracted services to implement. Staffing estimates are relative, and would likely be reduced if multiple actions are implemented simultaneously.

(3) In general, Low = Less than \$50,000 per county. Medium = Between \$50,000 and \$250,000. High = Greater than \$250,000.

As with other elements of the DIP, the degree to which the groundwater management actions can be implemented will depend largely on the amount of funding available. The Planning Unit recommends that the implementing agencies initiate attempts to obtain long-term sources of funding immediately. A preliminary list of potential sources of funding for ground water protection activities is provided below.

- Federal grants from EPA and United States Department of Agriculture
- Cooperative agreements with federal agencies (e.g., USGS) in which the federal government funds a portion of the project
- Clean Water Act Section 319 Non-point Source Fund
- Centennial Clean Water Fund
- Washington State Revolving Fund
- Washington State Water Pollution Control Fund
- Grants from the Washington Conservation Commission
- Create a septic system maintenance utility
- Tax or fee on septic system and/or water use with Aquifer Protection Area Program

- User fees on drinking water systems not associated with Aquifer Protection Area Program
- Property tax or other local taxes
- Plan review fees and permit fees
- Water rate surcharges adopted by public water systems benefiting from program
- Other state or local appropriations

The Planning Unit also recommends that where funding is derived from targeted fees or taxes, care must be taken to ensure that principles of fairness and equity are addressed.

A number of common-sense suggestions should be considered for successful implementation of a WRIA 27 and 28 ground water protection program. As presented in Section 6.6.4 of the Watershed Plan, the Planning Unit has adopted the following suggestions for implementation of ground water quality actions:

- Effective leadership and a clear understanding of roles and responsibilities will benefit implemented objectives and actions.
- Successful programs will require cooperation, communication, and information exchange between local water purveyors, cities, counties, and state government agencies.
- Key leadership and staff positions should be stable over a long-term period (e.g., need staff with institutional memory to sustain programs since local planners and elected officials are continually changing).
- Successful implementation of most strategies requires sustained commitment of dedicated technical staff.
- Long-term success will depend on the ability to integrate management programs into core local government responsibilities (such as wellhead protection, land use planning, permitting septic systems).
- An effective methodology is needed for monitoring the performance of implemented objectives and actions.
- The public should be involved throughout the adoption and implementation process.
- Short-term successes should be promoted to boost the success of the entire program.

Section 8

Implementation of Fish Habitat Condition Strategies

8.1 Fish Habitat Conditions Policies and Recommendations

Early in the watershed planning process, the Planning Unit elected to work collaboratively with the LCFRB to develop the habitat element of the Watershed Plan. This unique arrangement was significant to the Lower Columbia Region because it ensured a high degree of interconnectedness between the WRIA 27/28 Watershed Plan and the federally-approved Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (2006) (hereafter "Recovery Plan"). Development of the Recovery Plan and related implementation actions was guided by a vision to develop a scientifically credible, socially and culturally acceptable, and economically and politically sustainable plan that:

- Restores the region's four fish species listed as threatened under the federal Endangered Species Act (ESA) to healthy, harvestable levels; and
- Protects and enhances other fish and wildlife species that have been adversely affected by human actions, including the development and operation of the Federal Columbia River Power System.

The salmon recovery and watershed planning processes in the Lower Columbia region have integrated the following four interrelated initiatives to produce a single Salmon Recovery/Subbasin Plan for the region:

- U.S. Endangered Species Act recovery planning for listed salmon, steelhead and trout;
- Northwest Power and Conservation Council (NPCC) subbasin planning for eight full and three partial subbasins which guides Bonneville Power Administration's funding of projects to implement the fish and wildlife program;
- Watershed planning pursuant to the Washington Watershed Management Act, RCW 90.82; and
- Habitat protection and restoration pursuant to the Washington Salmon Recovery Act, RCW 77.85.

Consistent with RCW 90.82, this integrated approach ensures consistency and compatibility of goals, objectives, strategies, priorities and actions; eliminates duplication in the collection and analysis of data; and establishes a partnership of federal, state, tribal and local governments under which agencies can effectively and efficiently coordinate planning and implementation of actions.

8.2 Fish Habitat Conditions Implementation Actions

The habitat implementation approaches identified within the Watershed Plan were derived directly from the Recovery Plan, and set forth subbasin-specific strategies, measures and actions for protecting and restoring water processes and habitat conditions needed to achieve recovery of Endangered Species Act (ESA) listed fish populations, as well as other focal fish and wildlife populations. Conversely, the water quality and instream flow provisions outlined in the Recovery Plan are derived directly from the WRIA 25/26 and 27/28 Watershed Plans. The result is a high level of integration between the habitat actions of both plans.

There are five primary subbasins in the WRIA 27/28 planning area. These include the following: Columbia Estuary Mainstem; Kalama; Lewis; Lower Columbia Tributaries (Bonneville and Salmon); and Washougal. A series of Recovery Plan “Subbasin Plans” (Volume II, Chapters A and F through I) describe local conditions and detail implementation actions at the subbasin level. Each of these subbasin plans include:

- An **overview summary** of key priorities;
- An **assessment** that describes the subbasin, species of interest, subbasin habitat conditions, stream habitat limitations, watershed process limitations, other factors such as hatcheries, harvest, hydropower, and out-of-subbasin effects. The assessment includes qualitative and quantitative information;
- A **program and project inventory** describing significant activities in the subbasin; and
- A **management plan** that details a subbasin vision, biological objectives, integrated strategy, and specific measures and actions in each threat category.

Appendix I of this DIP includes a summary of the habitat implementation actions for each of the subbasins within the Planning Area. These actions address both regulatory and non-regulatory approaches for protecting and restoring fish habitat. The full Recovery Plan and specific subbasin chapters can be viewed online at: http://www.lcfrb.gen.wa.us/document_library.htm.

8.3 Fish Habitat Conditions Implementation Considerations

Implementation of the Watershed Plan habitat actions is guided by the LCRFB's 6-Year Habitat Work Schedule (HWS), which integrates the subbasin-specific habitat strategies, measures, and actions. The HWS builds upon and supplements the Recovery Plan by identifying reach-level habitat restoration and protection needs for each of the regions 17 subbasins. For each subbasin, the HWS includes excerpts from the Plan addressing:

- Listed populations and population recovery goals;
- A summary of key recovery priorities;
- An assessment of watershed processes;
- A subbasin and reach-level summary of habitat conditions and potentials;
- A subbasin reach map; and
- Prioritized subbasin habitat measures and submeasures.

To view the 6-Year HWS in closer detail, the reader is directed to the following link: http://www.lcfrb.gen.wa.us/document_library.htm.

Effective implementation of habitat actions will depend on the combined and coordinated actions of federal and state agencies, tribal governments, and local governments with the participation of nonprofit organizations, the business sector, and citizens. The primary tool identified in the Recovery Plan for addressing assigned habitat recovery actions and documenting an entity's commitment to fulfilling its implementation responsibilities is a "6-year Implementation Work Schedule" (IWS) that sets forth the tasks and schedule for addressing assigned recovery actions. The intent, content and function of a 6-Year IWS is discussed further in Section 9.5.

Section 9

Plan Implementation

9.1 Background and Context

Previous sections of this DIP identify a range of recommended actions in the areas of water supply, stream flow management, surface water quality, ground water quality, and habitat. In each of these sections, implementation considerations were described. These include prioritization of actions, identification of responsible organizations, estimation of costs, and identification of potential funding sources. This section addresses **overall** implementation needs to provide a solid foundation for those individual actions. This section builds on information and recommendations presented in a Report to the Legislature prepared by the Phase 4 Watershed Plan Implementation Committee in 2002. These recommendations have been reshaped to match local circumstances in WRIAs 27 and 28.

9.2 Implementation Obligations and Commitments

The Watershed Management Act prescribes a specific process for adoption of the Watershed Plan, and voluntary acceptance of obligations under the plan (See Section 90.82.130 RCW). Throughout the planning process, no organization or person was required to take on a commitment without their consent. However, once an organization formally agreed to implement actions under the Watershed Plan, and the plan was adopted in Joint Legislative Session, it is expected that these commitments will be implemented. Pursuant to RCW 90.82.130(3), any formal commitments or obligations made by State agencies or Counties become binding with adoption of the Watershed Plan.

It is important to note that during the Watershed Plan remand and adoption process, responsibilities and commitments related to implementation of specific management actions, activities and recommendations were clarified through revisions to various action descriptions. The terms “shall”, “may” and “should” were frequently used to help clarify roles, and are defined as follows:

- The term “shall” is mandatory;
- The term “may” is permissive and does not impose a mandatory requirement;
- The term “should” is a recommendation and does not impose a mandatory requirement.

The Action Schedules presented in Appendices E through H reflect these clarifications and revisions, and also specify whether an action is “mandatory” or a Planning Unit “recommendation”.

The Watershed Plan does not create any obligations for private businesses, citizens or landowners, although there are actions identified for *voluntary* implementation in the private sector. However, procedural and substantive requirements relating to water right permit processing, closures, instream flows, reservations, and mitigation requirements will apply to all entities addressed in the Watershed Plan.

In accordance with RCW 90.82.120(4), with adoption of the Watershed Plan by the Planning Unit, which includes representation by Ecology, the provisions of RCW [90.82.070](#) through [90.82.100](#) are deemed satisfied. Under these same statutes, Ecology is required to use the Watershed Plan as the framework for making future water resource decisions for the planned watersheds. Additionally, Ecology is required to rely upon the plan as a primary consideration in determining the public interest related to such decisions.

It will be important that any rules adopted by the State of Washington to implement the Watershed Plan remain consistent with the intent expressed by the Planning Unit in the Watershed Plan. The Watershed Plan strategies addressed in this DIP are intended to provide a balanced suite of actions to manage water resources in the planning area. In the event that a State rule-making process, legislative action, or court decision substantially alters implementation of the provisions outlined in the Watershed Plan, the other organizations with implementation responsibilities reserve the right to re-visit their implementation commitments as well. This is particularly true for County governments, which have the role of adopting the plan through the approval process under Chapter 90.82.130 RCW.

9.3 General Implementation Considerations

The implementation actions in this DIP are intended to be specific enough to clearly specify the action and result; yet general enough to permit flexibility in carrying them out. The Planning Unit recognizes that many actions require further investigation prior to full implementation. The Planning Unit also recognizes that some actions can be carried out only if funding is provided by the State Legislature or funding agencies, and that funding decisions will be made over a period of months or, years following plan adoption. Therefore, the implementation actions addressed in this DIP have been crafted to recognize these limitations and to allow for further decision-making on the road to achieving the Watershed Plan's objectives.

Throughout the Watershed Plan and DIP, implementation roles and considerations have been identified in the areas of water supply, stream flow management, habitat, surface water quality, and ground water quality. Lead organizations for implementing specific actions have been identified based on a general understanding of the various functions and activities of each organization. It is recognized that many implementation actions will require additional staff resources. At the same time, many of these actions can be integrated with existing programs and should not necessarily be viewed as new, additional responsibilities.

The Planning Unit also recognizes that authority or responsibility for undertaking specific actions may be associated with entities other than those identified as lead. Roles can vary significantly between otherwise similar organizations depending on legal authorities, staffing, and budget limitations. Where potential discrepancies in roles exist, appropriate lead organizations will be determined during the implementation phase.

9.4 Implementation Actions by Individual Organizations

It is critical that the individual organizations that voluntarily commit to carrying out DIP actions follow through on these commitments. These include the respective counties, cities, public water systems, state agencies and others, assuming each of them accepts certain commitments. It is important to recognize that the mix of actions in this plan results in a sharing of commitments between multiple organizations. This will help to spread the burden of carrying out actions, and will also provide for delivering real benefits across the region's jurisdictions.

The involvement of individual organizations in carrying out their commitments is vital to the Watershed Plan. The Planning Unit has no independent capability to implement DIP actions. It is the counties, cities, water purveyors, and State agencies, among others, that will ultimately carry out plan elements. Therefore, it is critical that their management and governing elected bodies take note of responsibilities described in the Watershed Plan and addressed in this DIP.

Many implementation roles are not mandatory and cannot become operational without the formal approval of specific activities by elected boards and commissions, or upper-level managers at the respective organizations. As described in Section 9.5, the Planning Unit requests each organization consider its recommended role(s) and provide a written indication, through preparation of a 6-Year Implementation Work Schedule (IWS), of its capacity and intent to carry out these actions.

Once approved by an agency's appropriate policy and decision-making authorities, the 6-Year IWS will constitute a formal commitment to pursue implementation of Watershed Plan actions. Accordingly, organizations will need to budget for plan actions and identify funding sources. This should be incorporated in the budget process each year (or biennium for State agencies). It will also be important to identify staff who will be responsible for carrying out that organization's commitments, and provide for reporting back to management and to the Planning Unit through the adaptive management process described below.

9.5 6-Year Implementation Work Schedules (IWS)

Section 8.4 of the Watershed Plan identifies the need to solidify implementation commitments through the development of formal work plans. The primary tool identified for documenting an entities commitment and approach to implementing specific actions is the "6-Year IWS". Each implementing partner will be asked to prepare an IWS that describes each action and identifies related tasks, schedules, benchmarks, challenges,

and cost considerations, covering a six year period. It is expected that 6-year IWS's will be revised every 2 years as necessary based on the adaptive management implementation evaluation checkpoints. **Given their high level of integration, both Recovery Plan and Watershed Plan actions will be addressed in each implementing partner's IWS.** Collectively, the combined 6-Year IWS's of all implementing partners will constitute the "regional" implementation plan for both the Watershed Plan and Recovery Plan. The Action Schedules in Appendices E through H of this DIP will serve as the foundation for development of 6-Year IWS elements related to the WRIA 27/28 Watershed Plan.

The information from each implementing partner's IWS will be entered into Salmon PORT, a Web-based data system that allows users to track implementation actions identified in the Recovery Plan and Watershed Plan in an efficient and effective manner. Salmon PORT is an interactive system that allows users to add, review, and edit IWS elements over time. Salmon PORT is designed to answer basic questions regarding how and when implementation actions are completed, and will help to establish benchmarks and milestones for measuring progress. Salmon PORT will also allow users to document impediments to implementation, such as budgetary and logistical constraints. It will also allow users, agencies and the public to access information and view a variety of reports related to implementation of the Watershed Plan and Salmon Recovery Plan. Additional information on Salmon PORT can be found at the following web address: <http://www.lowercolumbiasalmonrecovery.org/>

9.6 Grant Funding for Planning Unit Administration

In 2003 the Washington State Legislature amended the Watershed Planning grants program to provide Phase 4 grants to support implementation of watershed plans (Section 90.82.040 RCW). Applications for the grant can be made following approval of the Watershed Plan by both the Planning Unit and Counties, following the procedure described in Chapter 90.82.130 RCW.

The WRIA 27/28 Planning Unit is eligible for up to \$125,000 per year in each of the first three years of implementation. Following this, \$62,500 per year can be awarded in the fourth and fifth years of implementation. A match of ten percent is required, which can include either financial contributions or in-kind goods and services.

It is not expected that this limited amount of funding will cover implementation of the projects and programs discussed in this Watershed Plan. Instead, these funds should be considered "seed money" to strengthen the organizational foundation for Watershed Plan implementation and to pursue more substantial funding for the many activities and actions recommended in this DIP. Section 8.6 of the Watershed Plan discusses additional sources of funding that can be developed, if appropriate, during the implementation phase.

The Planning Unit anticipates that full implementation of the DIP actions and recommendations will require a time frame on the order of five to fifteen years. Some actions have already been carried out, or are actively being pursued. Many other

actions can be carried out in the first five years, while some will require longer to obtain funding, permits, and other necessary approvals. As noted above, the grant funding program is designed only for the first five years of this time frame.

9.7 Overall Coordination of Plan Implementation

The actions addressed in this DIP span a range of natural resources, activities, and organizations. Actions are identified for county governments, public water systems, state agencies, private industry, landowners and others. The intent has been to provide a balanced mix of recommended actions that collectively achieve the objectives stated in Section 3 (Table 2) of this DIP.

With a range of organizations involved, and an implementation period spanning many years, it will be important to put in place some mechanism for coordination and oversight. Some of the activities included under coordination and oversight are:

- Tracking implementation of Plan actions by the many organizations involved, to ensure actions are being carried out in a timely fashion; that the balanced nature of the plan is retained as actions are implemented; and that the most important priorities defined by the Planning Unit are being addressed;
- Coordinating efforts to seek funding for Plan actions, to avoid duplication of effort and ensure the State Legislature and funding agencies see well-organized and unified support for funding requests on an ongoing basis;
- Providing information to the public on Plan implementation and resulting improvements in watershed conditions;
- Providing early warning systems and joint responses to changing conditions, including physical conditions in the watershed; new regulatory developments; and new project proposals that may emerge from time to time;
- Monitoring of watershed conditions across jurisdictional boundaries, data management, and providing data access; and
- Periodic review of the Plan, and updating if warranted.

This list is not necessarily complete, but it shows the value of creating a system of coordination and oversight for the implementation phase.

To provide a venue for these activities, the WRIA 27/28 Planning Unit has transitioned from planning functions to coordination and oversight functions as recommended in Section 8.3 of the Watershed Plan. The purpose is to foster an organized and collaborative approach, as many individual organizations carry out specific actions under their jurisdictions, and to secure funding for implementation. The Planning Unit, at its option, may choose to form subcommittees as needed to follow up on selected areas for implementation, such as securing resources to install additional stream flow gauges; assessing alternative sources of supply to reduce stream flow impacts; protecting ground water quality; and assisting with implementation of other actions. The LCFRB will also continue to provide staff resources to support the Planning Unit in these activities to ensure implementation is coordinated and integrated with other

implementation initiatives. Funding for these purposes can be based on the State Phase 4 grants for the first five years of the implementation phase.

Section 8.3 of the Watershed Plan specifies that the Planning Unit will not take on any regulatory responsibilities or authorities during DIP implementation. Regulatory and permitting activities will continue to be the responsibility of State or federal agencies and local governments, consistent with existing laws. However, the Planning Unit anticipates the need to assist various entities with interpretation of the Watershed Plan, and to provide guidance and support to regulatory agencies and permit applicants. For example, the Integrated Strategy for Implementing Water Right Reservations (HDR and LCFRB, 2008) specifically recommends establishment of a standing Advisory Committee (AC) representing the WRIA 25/26 and 27/28 Planning Units to assist Ecology with review of mitigation proposals related to water reserve access.

9.8 Interlocal Agreements for Implementation

In order for the Planning Unit to be effective in the coordination and oversight role, local jurisdictions such as counties, cities, and water purveyors will need to continue to make staff resources available and actively participate in implementation. To further define coordination and implementation roles and responsibilities between implementing entities, the Watershed Plan suggests development of an interlocal agreement. Such an agreement may also be beneficial in further defining other implementation commitments among the organizations involved, beyond the level of detail presented in the Watershed Plan and this DIP. In response to this suggestion, the Phase 4 Planning Unit has developed an outline and framework that will serve as the basis for development of an interlocal agreement (Appendix J) during the implementation phase.

9.9 General Funding Strategy for Implementation Projects

Tables have been presented in earlier sections of this DIP that summarize implementation considerations². These tables include a preliminary estimate of the magnitude of costs, staffing implications for various organizations, and identification of potential funding sources. Where more detailed cost estimates were available, they were included in the Action Schedules presented in Appendices E through H. A mix of potential funding sources has been identified for different activities in the DIP. These sources include:

- Appropriations from the Washington State Legislature for state agency budgets (Ecology, DOH, DNR, Conservation Districts). This would provide funding and/or staffing that could be utilized under existing state programs to implement elements of the Plan;
- Direct appropriations from the Washington State Legislature for specific projects in WRIAs 27 and 28, based on requests to be formulated as the DIP is implemented;

² Tables listing implementation issues for specific actions appear in Sections 4 (water supply); 5 (stream flow); 6 (surface water quality); 7 (ground water quality); and 8 (habitat).

- Appropriations from the U.S. Congress for federal agency budgets (USGS, USFS) under existing programs;
- Grants or low interest loans from existing funding programs, such as the Public Works Trust Fund, State Revolving Fund for Drinking Water, Salmon Recovery Fund, and many other sources³.
- Rates and hookup charges collected from customers by public water systems (including cities that operate a water system, CPU, etc.)
- County permitting fees or general fund revenues;
- Assessments on property through local improvement districts, for projects that benefit those properties (subject to local approval);
- Private industry funds, for voluntary projects at selected industrial facilities (supplemented by public funds where possible); and
- Landowners, for voluntary projects at selected sites (supplemented by public funds where possible).

While not called out for any specific actions, it is also worth noting that Public Utility Districts and Conservation Districts have authority under State law to levy property taxes up to certain limits. If this source of funding is desired, it must be subjected to a vote of the affected public. This could be a valuable supplementary source of funding, particularly for activities that cross local jurisdictional boundaries.

It is important to recognize that many agencies and jurisdictions are currently funding programs that align closely with the objectives and recommendations of this DIP. In many cases, existing expenditures can be effectively integrated with this DIP, reducing the overall financial impact.

In developing a funding package for implementing the DIP, it is important to match funding to benefits. Some of the actions listed in the DIP, such as development of new ground water supplies, will benefit a specific community. In these cases, it is appropriate that the community contribute a large share of the cost. Other actions may be carried out by one community, but the purpose is to serve broader needs of the region, state or nation. For example, if a local community voluntarily wishes to switch from an existing source of supply to a new source to help restore populations of listed species, there will likely be considerable costs. The purpose of a project of this nature is to restore fish populations for the good of the region, the State of Washington and the nation as a whole. In this case, it is not equitable for a local community to bear the cost. While some cost burden may be acceptable at the local level, the majority of funding for this type of project should come from regional, state or federal sources.

³ The Phase 4 Committee Report to the Legislature includes an Appendix listing several dozen grant and loan programs that may be suitable for funding watershed actions.

Section 10

Research, Monitoring, Evaluation (RM&E) and Adaptive Management

Implementing a true adaptive management program for watershed planning is a very intensive exercise involving the development of conceptual models of the various systems and their interactions in the watershed. For this reason, the concept of adaptive management and its application are introduced in Section 8.7 of the Watershed Plan. However, its full development is deferred to the Implementation Phase (Phase 4), as a component of a broader RM&E program for the Lower Columbia Region.

The intent of this section is to describe the general adaptive management framework and provide a preliminary application of the framework to the stream flow management component of the Watershed Plan. This can be further refined and the same framework can be applied to the water supply, water quality, and habitat components under the Implementation Phase. Furthermore, this section includes a discussion of coordination and oversight for adaptive management, which are key components that need to occur during the Implementation Phase. Funding, as discussed in Section 9.9 of this DIP, is also critical to support implementation of monitoring and other elements of the adaptive management program. Because coordination, implementation, and funding issues have been discussed in the previous sections, emphasis is placed on the monitoring aspects of adaptive management in the following discussion.

10.1 Background on Adaptive Management

Adaptive management has been defined in State law as “reliance on scientific methods to test the results of actions taken so that the management and related policy can be changed promptly and appropriately” (RCW 79.09.020). It is described as a cycle that occurs in four stages (Manley et al, 1999): (i) identification of information needs; (ii) information acquisition and assessment (monitor); (iii) evaluation and decision-making (evaluate); and (iv) management action or response (respond). The first and fourth stages can often be considered as one, since part of the response to newly evaluated data may be to identify new information needs. Thus, the key stages of the adaptive management cycle as the exhibit shows is to “monitor”, “evaluate”, and “respond.” These three primary stages of adaptive management are described further below.

Adaptive management is a continuing attempt to reduce the risk arising from the uncertainty associated with information used to develop the management actions. Generally speaking, each stage of the cycle has an associated uncertainty which should decrease through each completed cycle of the process.

This is one perspective of applying adaptive management. An alternative way to look at adaptive management is to consider it as “experimental management” wherein the management actions taken are used to test key hypotheses and assumptions used to

develop the management actions. There are subtle differences in application, but conceptually they are similar in that adaptive management attempts to address uncertainty in information.

The watershed planning process culminating in this DIP can be regarded as having completed one cycle through this process. At this stage of the watershed plan, some management actions have been identified along with additional information needs. Thus, the beginning of the implementation phase of the plan can be considered to be starting the “information acquisition and assessment” stage of the cycle once again. From there, the cycle can continue wherein the new and additional information collected during the Implementation Phase can be evaluated to determine whether the management actions need to be refined or revised.

10.2 Monitor – Information Acquisition Programs

The Implementation Phase of the watershed planning process will involve putting into action many of the recommendations in the Watershed Plan, including collection of additional information. Once the information needs are identified, the next step is to collect information on how the Plan is being implemented. Different types of monitoring that would feed into the adaptive management framework could have different objectives. The Planning Unit has identified the following three types of monitoring and the corresponding general goals for inclusion in an RM&E program:

- Validation: determines if initial assumptions used to develop the plan are valid
- Implementation: determines if plans/projects are implemented as designed (yes/no)
- Effectiveness: determines if plans/projects are meeting management objectives

10.3 Validation Monitoring

Validation monitoring determines whether the assumptions used to develop the Plan recommendations are valid. Many of the general recommendations were developed based on certain assumptions about population trends, land use trends, and flow information, among other information. The recommendations may need to be changed if it is determined that some of these assumptions are not valid. Specific recommendations for additional validation monitoring include stream flow monitoring at priority streams, conducting engineering and planning studies for new water source development, and researching potential projects for floodplain and wetlands restoration. Preliminary validation monitoring activities are included in Table 12.

Table 12
Preliminary Items to Include in Validation Monitoring for Adaptive Management Program

Monitoring/Study	Description	Priority ⁽¹⁾	Implementers and Funding Sources	Spatial Scale and Frequency	Potential Adaptive Action
Planning and Engineering Studies	- Primarily feasibility studies and subbasin studies investigating new ground water or alternative supplies - Plan assumes ground water supply development will not have impacts to instream flows	<i>High</i>	<i>Lead:</i> Water purveyors <i>Support:</i> Ecology, DOH <i>Funding:</i> Public water systems, state or federal grants and loans	<i>Scale:</i> Local site- and project-specific <i>Frequency:</i> Initial feasibility and hydrogeologic study and necessary follow-up studies	- Studies may indicate that hydraulic connectivity exists or the project is not feasible (costs, capacity, etc.) - Other alternatives may be required, including mitigation
Land Use – Forest Monitoring	- Monitor assumptions regarding forest harvest rates and maturation of forests - Plan assumes forest cover will mature and harvest rates decline - Plan assumes no increase in agriculture	<i>High</i>	<i>Lead:</i> Land owner <i>Support:</i> DNR, USFS <i>Funding:</i> City and county permitting fees and general funds	<i>Scale:</i> Forest lands <i>Frequency:</i> Same schedule as county comprehensive plan updates	Can be used in conjunction with flow monitoring to evaluate what factors may be impacting changes in flow conditions
Land Use – Non-Forest Monitoring	Within authorities and as staffing and funding allow: - Monitor agricultural land use trends - Road densities - Rural and urban development - Changes in comp. plans and land use plans	<i>Medium</i>	<i>Lead:</i> Cities <i>Support:</i> Counties <i>Funding:</i> City and county permitting fees and general funds	<i>Scale:</i> WRIA-wide; consistent with county land use planning <i>Frequency:</i> Same schedule as county comprehensive plan updates	- May affect the water “reservation” allocation - Can be used in conjunction with flow monitoring to evaluate what factors may be impacting changes in flow conditions

Table 12 (cont.)
Preliminary Items to Include in Validation Monitoring for Adaptive Management Program

Monitoring/Study	Description	Priority ⁽¹⁾	Implementers and Funding Sources	Spatial Scale and Frequency	Potential Adaptive Action
Water Demand Monitoring	Within authorities and as staffing and funding allow: ▪ Monitor population trends in different sectors (urban, rural) ▪ Monitor industrial demands ▪ Confirm population and water demand projections assumed in the Plan	▪ <i>Medium</i>	▪ <i>Lead:</i> Water purveyors, counties ▪ <i>Support:</i> Ecology, DOH ▪ <i>Funding:</i> Public water systems, state or federal grants and loans	▪ <i>Scale:</i> WRIA-wide; consistent with county comprehensive plans boundaries and water system service areas ▪ <i>Frequency:</i> Continuous; same schedule as county comprehensive plan and water system plan updates	▪ May affect the water “reservation” allocation ▪ May need to reevaluate the ability to meet instream needs ▪ Evaluate the need for additional water conservation ▪ Identify areas in the basin where future instream and out-of-stream conflicts may arise and develop actions accordingly
Stream Flow Monitoring (basin-wide and project-specific)	Within authorities and as staffing and funding allow: ▪ Monitor flows at priority streams that do not have any flow data to develop basis for potential future flow restrictions or target flows ▪ Monitor flows at priority streams that have adopted flow restrictions or target flows for “compliance” ▪ Flow monitoring to be integrated with land use monitoring to	▪ <i>High</i>	▪ <i>Lead:</i> Ecology; will act as data clearinghouse ▪ <i>Support:</i> Ecology, USGS, LCFRB (or successor), counties, for general flow monitoring activities ▪ <i>Support:</i> USFS, DNR for monitoring effectiveness of forest practices ▪ <i>Support:</i> Cities and project owners for specific projects and developments ▪ <i>Funding:</i> Legislative (Ecology, DNR) and Congressional (USGS,	▪ <i>Scale:</i> WRIA-wide; priority stream reaches and at project specific locations ▪ <i>Frequency:</i> Continuous: annual, seasonal, daily; long-term duration (10-40+ yrs); project specific monitoring may be over a shorter period (< 5 years) for effectiveness	▪ Long-term data can be used to develop future minimum instream flows ▪ Assess progress and whether target flows need to be modified ▪ Assess the effectiveness of specific projects and whether additional measures are needed to meet flow objectives

Table 12 (cont.)
Preliminary Items to Include in Validation Monitoring for Adaptive Management Program

Monitoring/Study	Description	Priority ⁽¹⁾	Implementers and Funding Sources	Spatial Scale and Frequency	Potential Adaptive Action
	evaluate how land use change is actually affecting flow in priority streams ▪ Monitor flows where specific projects or actions have been implemented (e.g. water conservation, floodplain/wetland restoration, stormwater BMPs) ▪ Plan is currently limited to developing target flows at 4 locations within the basin where historical flow data exists ▪ Plan is relying on modeling data which needs to be validated over the long-term and at points throughout the basin		USFS) appropriations; public water systems		
Ground Water Level Monitoring	Within authorities and as staffing and funding allow: ▪ Monitor ground water levels in areas where new water supplies have been developed and in areas where significant exempt well use is occurring ▪ Plan assumes that	▪ <i>High</i>	▪ <i>Lead:</i> Ecology; will act as data clearinghouse ▪ <i>Support:</i> Ecology, USGS, LCFRB (or successor), counties, for general water level monitoring activities ▪ <i>Support:</i> Cities and water purveyors for specific projects and developments, and for	▪ <i>Scale:</i> WRIA-wide; priority stream reaches and at project specific locations ▪ <i>Frequency:</i> Continuous: annual, seasonal, daily; long-term duration (10-40+ yrs); project specific monitoring	▪ Long-term monitoring may show decreased water levels indicating the need for decreased use, conservation, alternative supply or change in management actions

Table 12 (cont.)
Preliminary Items to Include in Validation Monitoring for Adaptive Management Program

Monitoring/Study	Description	Priority ⁽¹⁾	Implementers and Funding Sources	Spatial Scale and Frequency	Potential Adaptive Action
	developing ground water supplies will not impact flows in priority stream		collection of data ▪ <i>Funding:</i> Legislative (Ecology) and Congressional (USGS) appropriations; public water systems; city general funds	may be over a shorter period (< 5 years) for effectiveness	
Water quality monitoring	Within authorities and as staffing and funding allow: ▪ Implement components of surface water quality monitoring plan described in Section 5. ▪ Implement ground water risk assessment studies ▪ Cleanup plans have been prioritized in the Plan based on current information ▪ Ground water sources may need protection based on susceptibility	▪ <i>Medium</i>	▪ <i>Lead:</i> Ecology and County health departments ▪ <i>Support:</i> Cities, DOH, public water systems ▪ <i>Funding:</i>	▪ <i>Scale:</i> WRIA-wide; priority stream reaches and at project specific locations ▪ <i>Frequency:</i> Continuous, annual, seasonal	▪ New surface water quality data may result in new priorities or additional streams for cleanup plans ▪ New ground water quality data and susceptibility assessments may lead to new priorities for ground water protection or cleanup

Table 12 includes a summary of the preliminary monitoring activities and studies that should be included in the information acquisition and assessment step of the adaptive management program. The activities are based on the management actions and recommendations in the previous sections of this DIP. However, the activities included in Table 12 do not include habitat and fish recovery activities because those are being addressed under the Subbasin Planning and Salmon Recovery Planning elements of the LCFRB's integrated RM&E program. Validation monitoring activities under these programs should be coordinated with the activities under Watershed Planning.

10.4 Implementation Monitoring

Implementation monitoring involves tracking whether the recommendations and commitments adopted in the Watershed Plan are being implemented and whether or not these activities have been properly completed (i.e., yes or no). Implementation monitoring generally involves measures whose results or benefits are fairly certain and do not require complex study designs, e.g. confirmation of whether a flow monitoring gauge has been installed at the proper location. As described in Section 9.5, Salmon PORT will be the primary tool for tracking and monitoring implementation of DIP actions.

10.5 Effectiveness Monitoring

Effectiveness monitoring is commonly applied in those cases where the benefit of a management action is less certain. For those commitments where the benefit is less certain, scientific study is needed to make a judgment of their effectiveness. The study can then also be used in developing or updating management responses that are appropriate. For example, the effectiveness of reconnecting a floodplain through removal of a dike may provide some flow benefits, but the magnitude of the benefit would require some further study. Once the actual benefit is measured, then a judgment can be made whether similar projects are worthwhile and should be continued or whether other options may be more beneficial.

10.6 Evaluate – Evaluation of Monitoring Information

Once information is collected through the information acquisition phase, it will be evaluated to determine whether the goals of the Plan are being met and what changes could be needed to achieve the Plan objectives. A general evaluation framework is presented below.

- **Management Actions** – all of the management actions designed to contribute to a Plan objective are identified. These management actions are evaluated to determine success.
- **Performance Metrics** – for each management action, one or more units of measurement are used to evaluate the success of the action. The implementation metric is yes/no, while the effectiveness metric is typically a statistical or numeric measurement resulting from the study.
- **Triggers** – for each performance metric, a threshold is established that serves as the indicator (or trigger) when the adaptive management process starts. The trigger must be measurable in a timeframe meaningful for informing management changes.

- Management response – after the trigger is “tripped” for a given performance metric, the management response process begins.

As part of the evaluation process, the cost-benefit of a particular management action can be considered by incorporating cost information as a performance metric or a trigger. For example, one can consider how the actual cost to implement the action compares with the estimated cost or evaluate how the realized benefits of the action balance the cost to implement the action.

10.7 Respond – Management Responses

Management responses are developed after the monitoring data are evaluated. The responses are then incorporated into the implementation of the Plan in a feedback loop. However, because of the limitations in information, the management response cannot always be known until the new information is collected and evaluated, and additional “negotiation” occurs. Therefore, three general responses can occur under adaptive management:

- Predefined mandatory management response – completely defined at the outset of the Plan.
- Mandatory collaborative management response – mandatory if a specific triggering condition is observed, but the Plan does not specifically describe in advance what the management response would be.
- Cooperative management response – result from opportunities to alter management activities that arise from observations during Watershed Plan implementation.

Because many of the recommendations and policies in the Plan are not enforceable on a “regulatory basis” many of the management responses are collaborative or cooperative in nature.

Table 13 illustrates the relationship between the performance metrics and triggers and the management responses. This table includes an example for the stream flow management recommendations addressed in this DIP. As indicated earlier, a similar framework can be used for water supply and water quality.

Table 13
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-1	<i>Maintain existing stream flow gauges and install additional permanent gauges</i> ▪ Maintain Heisson gauge and add at least one more stream gauge in the East Fork Lewis River subbasin ▪ Replace former stream gauge at RM 9.2 and add at least one more gauge in the Washougal River subbasin ▪ Add gauges in other streams where minimum instream flows or target flows are to be established.	I	<i>Implementation:</i> Evaluated through observation/inventory by coordination and oversight agency (COA)⁽²⁾ or third party. Audit to occur after an initial 2-year period from adoption of Plan and subsequently on a biannual basis.	<i>Implementation: (yes/no)</i> Audit determines that stream gauges are not being maintained and no additional gauges are being installed. Furthermore, a minimum number of gauges may be specified for installation within a certain time frame, e.g. 4 new gauges within 2 years of Plan adoption.	<i>Collaborative Response: Implementation:</i> COA will work with other implementing agencies to develop and implement an action plan for achieving the recommendation. This may include conducting a funding review and options for staffing to enable installation and maintenance of gauges.
SFP-2	<i>Closures are preferred over use of minimum instream flows, except in selected areas</i> ▪ Adopt closures and/or minimum instream flows in State Rule	I, E	<i>Implementation:</i> COA or third party audit of amendments to State Rule applicable to WRIAs 27 and 28. Audit to occur after an initial 2-year period from adoption of Plan and subsequently on a biannual basis. <i>Effectiveness:</i> Metrics will be developed to evaluate the impacts of the closures/minimum flows on protecting stream flows. May include: impacts to water rights applicants and changes in flow statistics (see target flows below). Metric to be evaluated at a minimum of every 5 years.	<i>Implementation: (yes/no)</i> Audit determines that no progress has been made toward developing closures/minimum instream flows; alternatively, audit determines agreements have been made on new closures or minimum instream flows but have not been adopted into rule. <i>Effectiveness:</i> Specific triggers will be developed if warranted after year 5 from Plan adoption as a mandatory collaborative agreement.	<i>Collaborative response: Implementation:</i> If no progress has been made, COA will work with Ecology to develop and implement an action plan for Ecology to develop the rule. If agreements have been made but have not been adopted, COA will work with Ecology to finalize or accelerate adoption schedule. <i>Effectiveness:</i> May require updates or revisions to closures or minimum instream flows based on effectiveness monitoring. This would require process to go through the rule-making process.

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-2	<i>Apply other land use and water use management in addition to stream closures to manage stream flows</i>	I	This policy refers to the use of the other specific recommendations and policies in the Plan to manage stream flow. Refer to other management actions for specific metrics, triggers, and responses.		
SFP-3	<i>State requirements for water conservation is sufficient for most communities</i> - Additional conservation efforts recommended for Battle Ground, Ridgefield, Yacolt, and Camas - Water conservation by farmers practicing irrigated agriculture, with assistance from Conservation Districts	I, E	<i>Implementation:</i> COA or third party audit of water conservation plans developed by the communities/irrigators as part of their water master plan/irrigation plan updates. Audit to occur at every water system/irrigation plan update after adoption of Watershed Plan. <i>Effectiveness:</i> Specific metrics on appropriate level of conservation for these communities/irrigators to be developed, but may include percentage of projected demand or a total annual volume.	<i>Implementation: (yes/no)</i> Water conservation efforts only meet State's minimum requirements and no indications are evident that additional conservation efforts are planned. <i>Effectiveness:</i> Specific triggers will be developed if warranted after year 5 from Plan adoption as a mandatory collaborative agreement. Triggers will consider measurable benefits with costs and inform future management actions for effectiveness and continuous improvement.	<i>Collaborative response:</i> <i>Implementation:</i> COA will work with communities/irrigators to develop and implement an action plan for achieving conservation goals. <i>Effectiveness:</i> Conservation goals may be revised if costs become too high or projected demands are not realized. Other management options may need to be emphasized.
SFP-5	<i>Develop alternative water sources where stream flows are impacted that minimize these effects.</i> - Cities of Battle Ground and Ridgefield should consider whole sale purchase of water from CPU - Camas should consider purchase from Vancouver	I, E	<i>Implementation:</i> COA or third party audit of water master plan updates or other engineering/planning studies to determine whether alternative water sources are being evaluated. Audit to occur at every water system plan update or after two years after adoption of Watershed Plan. <i>Effectiveness:</i> Specific metrics to be	<i>Implementation: (yes/no)</i> Audit indicates that communities are not considering other source of water. A finding is made that indicates a departure or an opportunity for improvement. <i>Effectiveness:</i> Specific triggers will be	<i>Collaborative response:</i> <i>Implementation:</i> Coordination and oversight agency (COA) will develop and implement an action plan for refining source substitution goals. <i>Effectiveness:</i> Alternative supply sources may be eliminated if feasibility study indicates limitations for

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
			developed, but may include: the feasibility of the alternative sources based on new studies or information, other opportunities for improvements in the source of supply as they are identified.	developed if warranted after year 5 from Plan adoption as a mandatory collaborative agreement. Triggers will consider measurable benefits with costs and inform future management actions for effectiveness and continuous improvement.	proceeding. May need to consider other alternatives as they are identified. May identify other communities that need to consider alternative sources.
SFP-6	<i>Ecology should use State Trust Program to identify water rights for sale or donation</i> ▪ Battle Ground, Ridgefield, and Yacolt, and Camas should consider transferring water rights to Trust, if source substitution is pursued	I, E	<i>Implementation:</i> COA or third party audit of number of water rights in State Trust for sale or lease. Participation of specific communities listed is dependent on whether alternative sources are pursued from SFP-5. <i>Effectiveness:</i> Specific metrics to be developed, but may include: the size of the water rights and whether water rights are being sold or leased once alternative sources are identified.	<i>Implementation:</i> (yes/no) No water rights are being submitted to State Trust. (An actual minimum number may be specified). A finding is made that indicates a departure or an opportunity for improvement. <i>Effectiveness:</i> Specific triggers will be developed if warranted after year 5 from Plan adoption as a mandatory collaborative agreement.	<i>Collaborative response:</i> <i>Implementation:</i> In conjunction with Ecology, COA will work directly with communities that have opportunities to transfer their rights to the State Trust and will refine goals for transferring to State Trust.

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-7	<i>Ecology to conduct initial surveys for unauthorized water use and take enforcement action when necessary</i>	I, E	<i>Implementation:</i> COA or third party audit of whether Ecology has conducted the survey after two years from adoption of the Watershed Plan. <i>Effectiveness:</i> Metrics will be developed after Ecology does initial survey, but may include number of unauthorized users or annual volume of use.	<i>Implementation:</i> (yes/no) Ecology has not conducted surveys after 2 years from Plan adoption. <i>Effectiveness:</i> Specific triggers will be developed if warranted after year 5 from Plan adoption as a mandatory collaborative agreement.	<i>Collaborative response:</i> <i>Implementation:</i> COA to work with Ecology to develop and implement an action plan for accelerating the survey schedule. <i>Effectiveness:</i> COA to work with Ecology to develop a response depending on the extent of unauthorized use and the cost-benefits of enforcement.

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-9	<i>Consider effects of forest management practices on stream flow in making forest management decisions, and monitor the effects and provide public documentation</i>	I, E	<i>Implementation:</i> COA or third party audit of USFS, DNR, and private land owner compliance with F&F and Northwest Forest Plan requirements, specifically implementation of monitoring requirements. <i>Effectiveness:</i> Specific metrics to be developed, but may include: length of roads upgraded (in compliance), percent sediment reduction, compliance with other BMPs.	<i>Implementation:</i> (yes/no) Audit indicates non-compliance with forest management requirements. <i>Effectiveness:</i> A finding is made that indicates a departure or an opportunity for improvement. Monitoring studies will compare measurable benefits with costs and inform future management actions for effectiveness and continuous improvement.	<i>Collaborative response:</i> <i>Implementation:</i> COA to work with USFS, DNR, and private land owners to improve compliance. <i>Effectiveness:</i> Based on findings from monitoring activities, revise or create enhanced BMPs for forest practice requirements/recommendations

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-10	<i>Clark, Cowlitz Counties and Vancouver, Camas, Washougal, Battle Ground should carry out legal responsibilities for stormwater management; other communities and Skamania Co. should review ordinances for protectiveness</i>	I, E	<i>Implementation:</i> Percent BMP compliance as determined by a combination of State, internal, and COA or third party audits. <i>Effectiveness:</i> Specific metrics to be developed, but may include: flow impacts to adjacent streams, water quality impacts, compliance with other BMPs.	<i>Implementation: (yes/no)</i> Compliance rate is less than some specified percentage or is some specific requirement(s) are not being complied with. <i>Effectiveness:</i> A finding is made that indicates a departure or an opportunity for improvement. Monitoring studies will compare measurable benefits with costs and inform future management actions for effectiveness and continuous improvement.	<i>Collaborative response:</i> <i>Implementation:</i> COA to work communities to improve compliance. <i>Effectiveness:</i> Based on findings from monitoring activities, revise or create enhanced BMPs for stormwater management requirements/recommendations.
SFP-11	<i>When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, jurisdictions should consider the water balance implications of allowing extension of sewer service to communities formerly served by septic systems.</i>	I	<i>Implementation:</i> COA or third party to audit whether counties have considered water balance implications of sewer extension.	<i>Implementation: (yes/no)</i> Counties have not considered water balance implications of sewer extension after 2 years from Plan adoption.	<i>Collaborative response:</i> <i>Implementation:</i> COA to work with counties to develop and implement an action plan considering water balance implications of sewer extensions.
SFP-12	<i>Within authorities, local jurisdictions with land-management responsibilities should protect existing floodplains and identify floodplains for restoration</i>	I, E	<i>Implementation:</i> COA or third party to audit number and locations of floodplain restoration projects and the number of designated floodplains for protection every 5 years	<i>Implementation: (yes/no)</i> Audit indicates that only a certain percentage of the floodplain survey for restoration has been completed or only a certain percentage of total floodplains has been	<i>Collaborative response:</i> <i>Implementation:</i> COA to work with counties to develop and implement an action plan for accelerating the floodplain survey schedule and assessment for protection.

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
			<i>Effectiveness:</i> COA or third party to audit number and locations of floodplain restoration projects every 5 years; in addition, the flow impacts from the floodplain restoration efforts.	designated for protection. <i>Effectiveness:</i> A finding is made that indicates a departure or an opportunity for improvement. Monitoring studies will compare measurable benefits with costs and inform future management actions for effectiveness and continuous improvement	<i>Effectiveness:</i> Based on findings from monitoring activities, revise or create floodplain restoration recommendations. Restoration activities may be reduced if flow impacts are minimal (unless habitat benefits provide justification).
SFP-13	<i>In conjunction with the Planning Unit, Counties should explore funding opportunities for conducting a county-wide wetland assessment that includes evaluation of hydrological functions. Counties should also require evaluation of hydrological function as part of any site-specific wetland assessments conducted under their critical areas, wetland or other land use ordinances. Their wetlands ordinances should be modified as needed to include hydrologic functions in the wetland protection hierarchy. Counties to consider strengthening mitigation ratios for selected wetlands</i>	I	<i>Implementation:</i> COA or third party to audit whether wetlands surveys for hydrologic function have been completed within 5 years from Plan adoption.	<i>Implementation: (yes/no)</i> Counties have not conducted wetlands surveys or have completed only a certain percentage of the survey (e.g. 25%).	<i>Collaborative response:</i> <i>Implementation:</i> COA and Planning Unit to work with counties to develop and implement an action plan for accelerating the survey schedule.

Table 13 (cont.)
Adaptive Management Framework for Stream Flow Management

Policy/ Recommendation	Management Action	Type (1)	Performance Metrics	Trigger (if...)	Management Response (then...)
SFP-4	<i>Major water users should develop policies and procedures for state-declared drought emergencies</i> City of Camas should consider developing a curtailment plan	I	<i>Implementation:</i> COA or third party audit of major water users' water master plan updates to occur after an initial 2-year period from adoption of Plan or at first water master plan update.	<i>Implementation: (yes/no)</i> Audit determines that major water users have not completed policies and procedures for drought emergencies.	<i>Collaborative Response:</i> COA will develop and implement an action plan for accelerating the schedule to develop policies and procedures.
Target Flows	Establish target flow monitoring and management program.	I, E	<i>Implementation:</i> COA or third party to audit whether target flows have been established at other locations in the basin. Implementation of this action is directly tied to the installation of stream flow gauges (SFP-1). <i>Effectiveness:</i> This recommendation is the general (or "programmatic") metric for the combined effects of the stream flow management actions. The percentage change (5%) is the performance metric to be evaluated and requires significant period of record (e.g. greater than 10-15 years of flow data).	<i>Implementation: (yes/no)</i> Audit determines that target flows are not being developed and no additional gauges are being installed. Furthermore, a minimum number of target flows may be specified for development within a certain time frame, e.g. 4 new target flow locations within 2 years of Plan adoption. <i>Effectiveness:</i> Flow statistics have not changed (or have changed less than 1% for example); alternatively, flow statistics change beyond the 5% within the planning period. Monitoring study will compare measurable benefits with costs and inform future management actions for effectiveness and continuous improvement	<i>Collaborative Response:</i> <i>Implementation:</i> COA will work with other implementing agencies to develop and implement an action plan for achieving the number of target flows to be defined. This work would be completed in conjunction with SFP-1. <i>Effectiveness:</i> Revise or update flow management actions based upon how flow statistics change. It should be noted that depending on the type of monitoring, it may be difficult to attribute cause-effect relationships in this case, unless specific management actions from above are being monitored individually to measure their effects on flow.

Notes:

⁽¹⁾ Monitoring Types:

I – Implementation monitoring

E – Effectiveness monitoring

V – Validation monitoring

⁽²⁾ Coordination and oversight agency (COA) – as discussed in Section 8.3, it is recommended that the WRIAs27 and 28 Planning Unit transition from planning functions to coordination and oversight functions to follow-up on selected areas of implementation. This same group or agency is used as the “surrogate” with responsibilities for tracking the triggers in this table.

10.8 Integration of Watershed Plan Monitoring into the LCFRB Research, Monitoring and Adaptive Management (RME) Program

To support the coordinated implementation of the Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (LCFRB 2006), the WRIA 25/26 and WRIA 27/28 Watershed Plans (LCFRB, 2006), and habitat protection and restoration efforts under the Washington Salmon Recovery Act (RCW 77.85), the LCFRB is developing an RM&E program that integrates efforts under all of these programs. This integrated approach promotes consistency and compatibility of goals, objectives, strategies, priorities and actions; reduces duplication in the collection and analysis of data; and establishes a partnership of federal, state, tribal and local governments under which agencies can effectively and efficiently coordinate planning and implementation of actions.

This RM&E program details the full spectrum of information needed for monitoring and evaluation of salmon recovery and watershed restoration in Washington's lower Columbia River subbasins, inventories what information and data are available from existing sources, and identifies critical information/data needs and priorities. The program includes the following six key monitoring elements:

- Biological status and trends
- Habitat status and trends
- Implementation/compliance
- Action effectiveness
- Uncertainty and validation research, and
- Programmatic evaluation.

For each element, the program identifies: A) objectives, B) indicators, C) sampling and analytical design, D) information gaps and priorities in available information, and E) implementation actions.

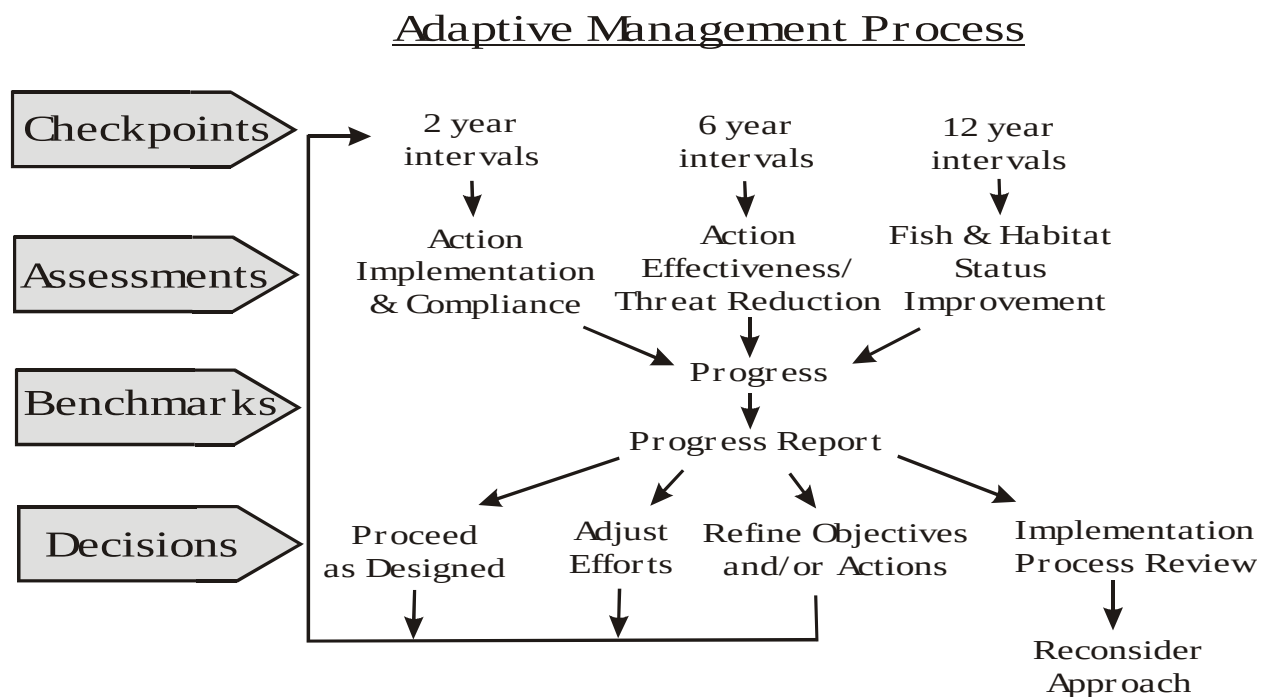
As described above, the WRIA 27/28 Watershed Plan provides general recommendations for various types of monitoring, including validation, effectiveness, and implementation. In addition, specific recommendations are provided for monitoring of:

- Stream flows (Section 4.2)
- Target flows (Section 4.3, Appendix F)
- Surface Water Quality (Sections 5.3, 5.4 and 5.5), and
- Ground Water Quality (Section 6.5)

The LCFRB's RM&E program has been drafted to address all the elements above. In developing the integrated RM&E program, the water quality and stream flow monitoring elements and related performance metrics were derived directly from the above-referenced sections of the Watershed Plan. The LCFRB's draft RM&E program (2008) is described in Appendix K.

An adaptive management program will be critical to effective implementation of this DIP. The adaptive management process for the integrated RM&E program is based on a series of checkpoints, assessments, benchmarks, and decisions (Figure 1). Checkpoints are formal decision points where substantive changes in direction will be considered. Assessments are formal evaluations of progress and results. Benchmarks are standards or criteria that will drive decisions depending on observed progress in implementation effort and effectiveness. Decisions identify refinements in efforts or new directions based on progress relative to benchmarks observed at checkpoints.

Figure 1: Elements and decision structure for adaptive management process for implementation of the WRIA 27/28 Watershed Plan and the Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (LCFRB 2006).



Decisions at each checkpoint depend on observed progress relative to benchmarks. Table 14 provides examples of the types of management actions that would result from the outcomes of action implementation, action effectiveness, and habitat and watershed status reviews.

Table14
Example management actions in response to implementation assessment findings.

Review Findings	Action	Review Type
<u>Action Implementation Review</u>		
Progress meets or exceeds benchmarks	Proceed as planned	Policy
Progress falls below benchmarks	Revise Implementation plan or approach	Policy
<u>Action Effectiveness Review</u>		
Effectiveness meets or exceeds benchmarks	Proceed as planned	Technical
Effectiveness falls below benchmarks	Evaluate action and revise strategy, measure and/or action(s). Revise implementation plan.	Technical/Policy
<u>Biological and Habitat Status Review</u>		
Biological response and habitat status (e.g., stream flows, water quality, etc.) meets or exceed benchmarks	Proceed as planned.	Technical
Biological response meets or exceeds and habitat status falls below benchmarks.	Evaluate and, as necessary, revise habitat measures and actions. Proceed as planned for other harvest and hatcheries. Revise implementation plans.	Technical/Policy
Biological response and habitat status fall below benchmarks	Evaluate and, as necessary, revise strategies, measures and actions for all H's. Revise implementation plans.	Technical/Policy
Biological response falls below and habitat status falls meet or exceed benchmarks	Evaluate and, as necessary, revise hatchery and harvest strategies, measures, and actions. Revise implementation plans.	Technical/Policy

10.9 Next Steps for Adaptive Management Program

The issues discussed above provide a starting point for implementing an integrated adaptive management program for the Watershed Plan. As mentioned previously, this is a very involved process. Some of the most important adaptive management issues that may need further consideration during the Implementation Phase are listed below.

- It is a given that for adaptive management to proceed and be successful, stakeholders must commit to conducting the monitoring and must also commit to the actual adaptive management steps of evaluating the new information, and responding with revisions to management actions. In the Implementation Phase it is important to identify the coordinating and oversight entities (agencies or individuals) that will lead the adaptive management effort.
- “Metrics” and “triggers” need to be evaluated in detail to indicate whether a change in the management action is needed; or with respect to “validation” monitoring whether the management action needs to be reevaluated because of an incorrect input assumption. As part of this evaluation, an “error band” should be estimated for the sources of uncertainty. For example, if demand projections change, then the need for certain management practices may be more critical, e.g. conservation may be more important if projected demands are greater than estimated.
- The intended effects and unintended direct and indirect effects that the management actions should be evaluated. For example, how might increased flows affect other conditions in the basin such as sediment loads, flushing flows, and bank stability.
- The cost-benefit of the different management objectives should be considered. For example, what are the economic impacts to implementing these management practices, e.g. in terms of jobs vs. actual improvements in water quality, water quantity, and fish recovery.

The priority for the different management actions are listed in previous sections of this DIP. Generally, this prioritization applies to the associated monitoring activities for stream flow management as listed in Tables 13. However, in order to fully evaluate how much monitoring is needed and how much can be coordinated with other competing needs in the basin, a similar adaptive management review for water quantity, water quality, and habitat needs to be done during the Implementation Phase.

Section 11

Future Watershed Plan Updates

The WRIA 27/28 Watershed Management Plan was developed over an eight-year period, with input from dozens of local leaders, state and federal agency staff, and citizens. It is the first effort in this region to assemble a comprehensive portrait of water resource needs, issues and solutions. The actions recommended in the plan and addressed in this DIP were developed given current understanding of conditions as they exist at the time the Watershed Plan was developed. Over the next several years, new data will be collected, conditions may change, regulatory and funding programs may change, and new projects affecting water resources may be proposed within the region. In addition, the implementation process may result in some modifications of the recommended actions as they are actually carried out.

To accommodate this ongoing evolution of information and events in the region, it is recommended that the Watershed Plan be reviewed from time to time to determine whether an update is needed. This review should be carried out by the Planning Unit, as one of its implementation responsibilities. The first review should occur no later than 2009, and additional reviews shall occur no later than every 7 years thereafter. Plan reviews may be conducted at any time if requested by majority vote of any approving County Board of Commissioners. If identified as a need by the Planning Unit or any approving County Board of Commissioners, rule review may also be initiated as a result of the plan review process.

The Phase 4 Committee Report to the Legislature identified the following questions for a review of this type:

- Have the actions listed in the Plan been implemented?
- Are the desired results being achieved?
- Is the overall intent of the Plan being met?
- Are there new information gaps or changing conditions that require review?
- Are there new issues that were not considered during Plan development, and that need to be addressed?

If the Planning Unit finds that an update is needed, this finding should be communicated to the original Implementing Governments that launched the WRIAs 27 and 28 Watershed Plan process. It should be noted that the Watershed Management Act does not require or address updates to Watershed Plans, and at this time no funding is available for such updates under the Watershed Planning program. The Implementing Governments should have the responsibility to determine whether to proceed with updating the Plan, and to identify means of funding and staffing an update.

The strategies listed in the adopted Watershed Plan were designed to function as a combined whole. If any key element is struck down by legislative or court action, or becomes otherwise infeasible to implement, the remainder of the Plan should be revisited to determine whether other elements need to be modified.

Section 12

Future Detailed Implementation Plan Updates

12.1 DIP Update Process

In 2003, the Washington State Legislature established a fourth phase of planning under the Watershed Planning Act (RCW 90.82), referred to as the “Implementation Phase”. This legislation specifies that a detailed implementation plan (DIP) must be completed within one year of accepting phase four funding under (90.82.040)(2)(e), and that submittal of the DIP will be a condition of receiving grants for the second and all subsequent years of phase four grants. Although the statute identifies key elements to be addressed by the Planning Unit, no process is described for county approval of a DIP or subsequent amendments or updates. Absent a statutorily defined process, this DIP was approved by the Planning Unit under the consensus-based decision framework used to develop and approve the Watershed Plan.

The adopted DIP was prepared with the assumption that the Planning Unit will continue to coordinate, track and guide implementation of actions, and update the DIP as needed. It is also expected that the LCFRB will continue to provide administrative, coordination, and technical assistance to the Planning Unit. For further information on implementation roles and responsibilities, the reader is referred to Section 9.

The Planning Unit recognizes that to be effective and useful to implementing partners, the DIP must be a flexible and working document. Implementation actions must be responsive to new data and information, innovative management strategies, emerging issues, and adaptive management triggers. To accommodate these dynamic considerations, it is important that the DIP be periodically reviewed and updated by the Planning Unit. To accomplish this, the Planning Unit will complete the following on a biennial basis:

- Conduct a review of implementation progress and results, addressing the following:
 - Whether actions were implemented as planned;
 - Whether actions and outcomes meet established benchmarks and objectives; and
 - Whether funding, coordination, logistical or other constraints impede implementation;
- Provide an implementation report to the Boards of County Commissioners and Initiating Governments, with recommendations for addressing implementation constraints;
- Update the DIP, if needed; and
- Provide recommendations for updating the Watershed Plan to the Boards of County Commissioners and Initiating Governments.

The Planning Unit and LCFRB have taken a phased approach to developing several sections of the DIP, including the Integrated Strategy for Implementing Water Right Reservations (HDR and LCFRB, 2008), and the draft Lower Columbia Research, Monitoring and Evaluation (RM&E) Program (LCFRB, 2008). As additional elements of these documents are completed, revised and approved by the Planning Unit, they will be integrated into the applicable sections of this DIP.

12.2 Relationship to Watershed Plan Updates

A process for periodically reviewing and updating the adopted Watershed Plan is already established, and is outlined in Section 11 above. The Watershed Plan update process is proposed to occur at seven year intervals starting in 2009, or can be conducted any time in response to a majority vote by any approving Board of County Commissioners. The Watershed Plan calls upon the Planning Unit to conduct this review. It is expected that information and data collected through the biennial DIP review and provided to the Boards of County Commissioners and Initiating Governments will help establish the need and foundation for future Watershed Plan updates.

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Appendix A

Salmon-Washougal and Lewis Watersheds

Guiding Documents

Guiding Principles

In developing the Detailed Implementation Plan, the Planning Unit will ensure that the mission statement, objectives, ground rules and operating principles outlined in the WRIA 27/28 Salmon-Washougal and Lewis Watershed Management Plan are followed. In addition, we agree to operate under the following guiding principles:

In developing the Detailed Implementation Plan, the Planning Unit will:

- Ensure the overall balance of the watershed plan is maintained in identification and prioritization of implementation actions;
- Focus efforts on identifying and prioritizing actions that achieve multiple objectives;
- Achieve goals and objectives in the most cost-effective and efficient manner possible;
- Strive to ensure overlap and duplication of efforts is avoided;
- Ensure actions are coordinated and integrated with other planning efforts in the watershed (e.g., Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan, Growth Management Planning, TMDLs, etc);
- Facilitate and promote active participation by those entities affected by actions and key decisions;
- Keep affected entities informed of key decisions and outcomes;
- Work cooperatively to achieve all goals and objectives of the plan;
- Strive to ensure planning actions are integrated into federal, state and local decision-making processes;
- Work to broaden public awareness and support of the plan;
- Identify and pursue early implementation opportunities; and
- Develop a funding strategy as an early action item in plan implementation.

Mission Statement, Goals and Objectives

Mission Statement:

"Develop and implement watershed management and implementation plans for the responsible use of water to balance the needs of people and natural resources."

Goals:

- Develop and implement a water quality/quantity management plan so we have good water in the future
- Use water resources while preserving water quantity and quality
- Involve the public early in decision-making
- Maximize public involvement in development and implementation of our plan
- Treat all water as a valuable resource
- Develop and implement strategies to work with federal, state and local governments and public/private interests with the goal of stabilizing and recovering native salmonids and their habitat
- Ensure effective and efficient implementation of the plan
- Maximize local control

Planning and Implementation Objectives

I. Objectives to Protect or Enhance Conditions in the Watershed

- Effectively and efficiently manage water to ensure availability, reliability and predictability for beneficial uses over the long term, considering ongoing changes in population, local economies, and water-use technology.
- Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages
- Protect surface water quality for designated uses, with an emphasis on protection of aquatic biota, including fish species in their various life stages.
- Protect surface and ground water needed for public drinking water supplies.
- Maintain productive habitat and enhance degraded habitat forming processes for indigenous fish species in all life stages.
- Protect and enhance wetlands and floodplains, with associated benefits for flows, water quality, ground water recharge and flood control.

II. Objectives Regarding the Process for Developing and Implementing Watershed Plan

- Manage water resources in a cost-effective manner, taking into account existing programs, potential partnerships, cost/benefit principles, and opportunities to achieve multiple objectives
- Ensure strategies contribute to a healthy local and regional economy.
- Ensure plan can be implemented through sustained support by local governments, state agencies, tribes, water-use interests and the public
- Provide for extensive and meaningful public participation
- Ensure fairness in distributing costs and burdens of water-resource management actions
- Improve public understanding of water resources and encourage responsible stewardship.

III. Objectives for Improved Information and Data Management

- Improve scientific basis for decision-making on water-resource issues, through sound data, accepted technical methods, and effective quality assurance/quality control protocols.
- Develop an effective adaptive management program, supported by long-term monitoring and ongoing developments in scientific understanding

Ground Rules and Operating Principles

Planning Unit Ground Rules

The members of the Planning Unit for Water Resource Inventory Areas 27 and 28 adopt the following ground rules for the conduct of their business.

- 1) We will focus our discussions on the issues associated with developing and implementing a plan for the management and use of water resources. We will avoid debating issues beyond the scope of that effort.
- 2) We represent a broad range of interests, each having an interest in how our water resources are used and protected. We recognize the legitimacy of each other's interests and concerns in our efforts to forge and implement an effective and viable management plan.
- 3) All participants will be treated with respect and dignity. We will not tolerate personal attacks directed at individuals and agencies.
- 4) We commit to understanding each other's interests and concerns. There should be no hidden agendas. We will openly and candidly share our concerns and interests and engage in thoughtful dialogue. We will listen carefully. We will ask questions for clarification. We will respect each other's right to disagree.
- 5) We commit not to characterize each other's motivations, values, or positions in any discussions that we may have with the press. We will not attribute specific statements or positions to a participant with their prior approval and we will seek such approval during the course of our meetings whenever possible. We commit to work out our differences at the table rather than in the press.
- 6) We commit to search for opportunities and creative solutions. We will focus on problem solving, rather than stating positions.
- 7) We commit to making decisions by consensus. Consensus does not require that all members endorse or agree with the proposal or decision, but at a minimum all members must be willing to accept the proposal or decision. If consensus cannot be reached, the participants will:
 - a. Determine if the decision is critical to the group's work. If not, the group may decide to drop the decision or proposal. If yes, continue to work longer toward consensus.

- b. Consider appointing a subgroup to examine the issue and, if possible, submit a revised proposal to the full group for consensus consideration. Provide the subgroup a timeline to report back to the full planning unit.
 - c. Consider adopting several alternatives or options for addressing an issue.
 - d. Consider the ranges of agreement in the attached Definition of Consensus.
- 8) We agree that this planning and implementation effort is a priority in terms of committing our time and resources. We agree that consistency in participation is critical. According, we commit to make every effort attend meetings of the planning unit. However, in recognition that events may periodically arise which prevent attendance, each participant may name an alternate to attend meetings on his or her behalf. The alternate will not simply be an observer, but will have the same authority to act as the principal participant. The participants shall be responsible for ensuring their alternate is informed and fully prepared to participate.
- 9) All participants accept the responsibility of keeping their associates, organization, or constituency informed of planning unit's progress and issues under discussion. Each participant also accepts the responsibility of representing the needs and interests of their associates, organization, or constituencies. Adequate time will be provided prior to major decisions to allow participants to consult with their associates, organization, or constituency. Strategic checkpoints will be established to allow participants to review progress made with their associates, organization or constituency and report back any concerns to the group. A participant may ask the group to reconsider any decisions within two months following the decision.
- 10) The use and protection of our water resources is an important public issue. Our meetings will be open to the public and we will make time available at each meeting for the members of the public to share their concerns, interests, and suggestions with us.
- 11) We agree that anyone may resign from the planning unit at anytime. If the reason for resignation stems from a concern with the work or conduct of the planning unit, the participant will advise the other participants of this concern and allow them to the opportunity to resolve the problem before resigning.
- 12) We will keep minutes of our meeting. The minutes shall summarize the discussions and document the decisions of the planning unit. They will not attribute statements to specific participants unless a participant advises the recorder that his or her statement is being made for the record. The source of background information or data used in discussions or decisions may be cited.

Operating Principles

Definition of Consensus for WRIA 27/28

Consensus is defined in terms of agreement along a continuum. Team Members may register the degree of their language agreement within any of the first six columns:

Endorse	Endorse with a minor point of contention	Agree with reservation	Abstain	Stand aside	Formal disagreement but will go with the majority	Block
"I like it"	"Basically I like it"	"I can live with it"	"I have no opinion"	"I don't like it but I don't want to hold up the group"	"I want my disagreement to be noted in writing but I'll support the decision"	"I veto this proposal"

(Adapted from: "Facilitator's Guide to Participatory Decision-Making," 1996)

The last (shaded) column on the right side of the continuum is *not* considered acceptable for consensus in this process. However, anything to the left could be considered "agreement by consensus."

Appendix B
Salmon-Washougal and Lewis Watersheds
Scoped Management Actions

Appendix B WRIA 27/28 Watershed Management Plan Implementation Actions and Recommendations ¹					
Category: Water Supply					
Priority⁽²⁾	Sub-priority	Actions and Subactions	Implementers⁽⁴⁾	Financial / Economic Costs⁽³⁾	Potential Funding Sources
High		Action #944: Public Water Systems develop new or expanded supplies. Requires engineering studies; approval of water system plan; water rights processing; other permitting; SEPA compliance; construction; operations & maintenance. Standard procedures exist for all of these (See Section 3.3.1).	<i>Lead:</i> Public Water System <i>Others:</i> DOH, Ecology	Medium	<i>Main:</i> Water rates and hookup charges in affected service area <i>Additional:</i> Grants or low-interest loans from existing state & federal programs
		Subaction #944A: Revise and update water system plans consistent with the adopted WRIA 27/28 Plan (See Section 3.3.1).	Cities, Counties, Department of Health, Ecology, etc.		
		Subaction #944B: Implement Section 3.3.1 when identifying new or expanded water supplies.	Municipalities, Counties, purveyors, DOH, Ecology, etc.		
		Subaction #944C: Reserve a block of water for future public water supply that would not be subject to the closures and/or instream flows establish by rules for WRIAs 27 and 28. (Tasks would include rule writing and adoption, and coordination with the Planning Unit)- Pg. 3-13	Ecology, Planning Unit		
	High	Subaction #944D: Develop a regional ground water source at Vancouver Lake in a timely manner. (Tasks would include engineering studies, coordination with clean-up efforts, water rights processing, SEPA, facilitation by agencies, construction, operations and maintenance, etc) Pg. 3-19	CPU (others: City of Vancouver, Port of Vancouver, Ecology, DOH, etc)		
	High	Subaction #944E: Develop a regional ground water source at Vancouver Lake in a timely manner. (Tasks would include engineering studies, coordination with clean-up efforts, water rights processing, SEPA, facilitation by agencies, construction, operations and maintenance, etc) Pg. 3-18	Vancouver (others: CPU, Port of Vancouver, Ecology, DOH, etc)		

¹ Page and section numbers referenced in this document refer to the adopted Salmon-Washougal and Lewis Watershed Management Plan (LCFRB, 2006)

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
	High	Subaction #944F: Investigate and develop a regional ground water source in the vicinity of Steigerwald Wildlife Refuge, or purchase from Vancouver (if other opportunities prove infeasible). (Tasks would include engineering studies, water rights processing, SEPA, construction, operations and maintenance, etc) Pg. 3-20, Pg. 3-22	City of Washougal, City of Camas (others: Ecology, City of Vancouver)		
		Subaction #944G: As needed based upon increased demand, expand the City of Woodland's Ranney well system. (Tasks would include water rights processing, engineering studies, SEPA, construction and maintenance, etc) Pg. 3-23	City of Woodland (others: Ecology, DOH)		
		Subaction #944H: As needed based upon increased demand, expand the City of Washougal's well system. (Tasks would include compliance with Section 3.3.1, water rights processing, engineering studies, SEPA, construction and maintenance, development of necessary mitigation plans, etc) Pg. 3-22	City of Washougal (others: Ecology, DOH)		
		Subaction #944I: As needed based upon increased demand, expand the City of Kalama's Ranney well system. (Tasks would include compliance with Section 3.3.1, assessment of instream flow impacts, water rights processing, engineering studies, SEPA, construction and maintenance, development of necessary mitigation plans, etc) Pg. 3-23	City of Kalama (others: Ecology, Fish and Wildlife, DOH)		
		Subaction #944J: Implement the Salmon Creek Water Resource Plan. Pg. 3-19	Clark Public Utilities (others: Ecology, DOH)		
High		Action #945 (#932): Planning studies to explore alternative sources of supply to replace an existing source (selected communities) (See Section 3.3.2).	<i>Lead:</i> Public Water System	Low	<i>Main:</i> Water rates in affected service area
	High	Subaction #945A: Conduct planning studies and investigations necessary to support development of a regional ground water source at Vancouver Lake, in a timely manner. (Tasks would include engineering studies, permitting, facilitation by agencies, etc) Pg. 3-19	CPU (others: City of Vancouver, Port of Vancouver, Ecology, DOH, etc)		
	High	Subaction #945B: Conduct planning studies and investigations necessary to support development of a regional ground water source at Vancouver Lake, in a timely manner. (Tasks would include engineering studies, permitting, facilitation by agencies, etc) Pg. 3-18	Vancouver (others: CPU, Port of Vancouver, Ecology, DOH, etc)		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #945C: Conduct planning studies necessary to support and develop a regional ground water source in the vicinity of the Steigerwald Wildlife Refuge, or evaluate purchase from Vancouver (if other opportunities prove infeasible). (Tasks would include engineering studies, permitting, facilitation by agencies, etc) Pg. 3-20, Pg. 3-22 Related Subaction (see below) #945D: The City of Camas should consider alternative sources of supply to reduce or cease use of surface water diversions on Boulder and Jones Creeks. Such alternatives include installation of new wells, purchases from City of Vancouver and development of non-potable source of supply. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and evaluation of other feasibility criteria. Pg. 4-55	City of Camas, City of Washougal (others: Ecology, City of Vancouver)		
	High	Subaction #945E: Investigate opportunities for a regional ground water source near the Lower North Fork Lewis/East Fork Lewis confluence. Pg. 3-15	CPU (others: LaCenter, Battle Ground, Ridgefield, etc,?)		
		Subaction #945F: Due to the potential for withdrawal from the City's existing wells to impact stream flows in the East Fork Lewis River and Salmon Creek, Battle Ground should undertake a review of alternative sources of supply (including purchase from CPU and use of reclaimed water), similar to that discussed in Section 3.3.1. The City's plans for a new well should also be subject to Section 3.3.1. Pg. 3-21 Related Subaction (see below) #945G: The City of Battle Ground should consider wholesale purchases of water from CPU to eliminate water-supply impacts on stream flow. This is preferred over water conservation, because of greater benefits to flow. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and other feasibility criteria. Pg. 4-41	City of Battle Ground (others: Ecology, Health Department)		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction (#945H): Evaluate purchase of water from CPU to aid in meeting future demands, utilizing the recently installed fire flow intertie. Pg. 3-21 Related Subaction (see below) (#945I): The City of Ridgefield should consider wholesale purchases of water from CPU to eliminate water-supply impacts on stream flow. This is preferred over water conservation, because of greater benefits to flow. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and other feasibility criteria. Pg. 4-41	City Ridgefield (others: Ecology, DOH)		
High		Action #946: Replace an existing source of supply with a different source to reduce impacts on stream flow. Requires engineering studies; water rights processing; other permitting; inter-local agreements or contracts; construction; operations & maintenance (See Section 3.3.2).	<i>Lead:</i> Public Water System <i>Others:</i> DOH, Ecology, adjacent water system(s) to serve as wholesaler	Medium to High	<i>Main:</i> Leg. appropriation <i>Additional:</i> Water rates in affected service area
		Subaction #946A: Pending positive outcome of studies and planning, replace existing water sources with a regional ground water source in the vicinity of Steigerwald Wildlife Refuge, or purchase from Vancouver (if other opportunities prove infeasible). (Tasks would include engineering studies, water rights processing, SEPA, construction, operations and maintenance, etc) Pg. 3-20, Pg. 3-22	City of Camas, City of Washougal (others: Ecology, City of Vancouver)		
	High	Subaction #946B: Pending positive outcome of studies and planning, replace existing water sources with a regional ground water source at Vancouver Lake, in a timely manner. Consider sale of water from this supply source to other purveyors for use in meeting future demands. (Tasks would include engineering studies, coordination with clean-up efforts, water rights processing, SEPA, facilitation by agencies, construction, operations and maintenance, etc) Pg. 3-19	CPU (others: City of Vancouver, Port of Vancouver, Ecology, DOH, etc)		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
	High	Subaction #946C: Pending positive outcome of studies and planning, replace existing water sources with a regional ground water source at Vancouver Lake, in a timely manner. Consider sale of water from this supply source to other purveyors for use in meeting future demands (Tasks would include engineering studies, coordination with clean-up efforts, water rights processing, SEPA, facilitation by agencies, construction, operations and maintenance, etc) Pg. 3-18	Vancouver (others: CPU, City of Vancouver, Port of Vancouver, Ecology, DOH, etc)		
	High	Subaction #946D : Pending positive outcome of studies and planning, replace existing water sources with a regional ground water source near the Lower North Fork Lewis/East Fork Lewis confluence. Consider sale of water from this supply source to other purveyors for use in meeting future demands (Tasks would include engineering studies, water rights processing, SEPA, construction, operations and maintenance, etc) Pg. 3-19	CPU (others: City of Vancouver, Port of Vancouver, Ecology, DOH, etc)		
	High	Subaction #946E: If alternative water sources are not secured (per Section 3.3.1), develop additional wells in the Pioneer area to serve as a public water supply, consistent with the off-setting and habitat mitigating measures outlined in Section 3.3.1. (Tasks would include engineering studies, impacts assessment and mitigation plan development, water rights processing, SEPA, construction, operations and maintenance, etc) Pg. 3-19	CPU (others: City of Battle Ground, Ridgefield, LaCenter, Ecology, etc)		
		Subaction #946F: Replace Jones and Boulder Creek water sources alternative sources of supply, following the procedure outlines in Section 3.3.1. If new water rights are secured, retire existing sources or use them only during periods of high flow. Pg. 3-20	City of Camas (others: Ecology, WDFW)		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #946G : For cases in which <i>existing</i> municipal supplies (as contrasted with planned <i>future</i> supplies) have the potential to negatively impact flows in critical stream reaches, the Planning Unit recommends that selected communities voluntarily consider enhancing their conservation efforts and undertake a review of alternative sources of supply, similar to that described in Section 3.3.1. It is recommended that, where feasible, these water suppliers cease or limit the use of certain existing supplies and develop alternative sources of supply that are less likely to impact flows in critical stream reaches. It is also recommended that implementation of such alternatives be eligible for funding from regional, state, or federal funding programs (see Section 3.6). Pg. 3-14 Water suppliers in this situation should also consider availability of regional supplies (Section 3.3.3). It is important to note that existing municipal water rights are not subject to relinquishment if use of the rights ceases or is limited. Pg. 3-14	To Be Determined		
		Subaction #946H: In those cases where new supplies are required for small Group A systems, it is recommended that a review of alternative sources of supply be conducted (see Section 3.3.1), with an emphasis placed upon evaluating the purchase of water from an existing major water purveyor (see Section 3.3.3). If new sources are required and a reserved block of water is not available, then the net impact to surface flows should be off-set by acquiring existing upstream water rights. Pg 3-27	To Be Determined		
		Subaction #946I: Coordinate with the Watershed Stewards Program to identify any actions it may take to aid in the Gee Creek restoration effort. If low flows are identified as an issue needing to be addressed, the City should undertake a review of alternative sources of supply, similar to that discussed in Section 3.3.1. The City's existing plans for new wells should be considered in this exercise, if the new wells are anticipated to have less of an effect upon stream flows than current sources. (Note: relates to stream flow actions below) Pg. 3-24	City of Ridgefield (others?)		
Medium		Action #947: Develop map of region's aquifers with emphasis on surface water hydraulic continuity (See Section 3.3.1).	<i>Lead:</i> Ecology <i>Other:</i> Public water systems	Medium	<i>Main:</i> Grants, water purveyor revenues
	High	Develop a map that depicts the locations of deep aquifers that are not in hydraulic continuity with streams and are suitable for water supply development. (Tasks would include engineering	<i>Planning Unit,</i> <i>USGS (others:?)</i>		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		studies, plan development, etc). (Note: Relates to "Planning Studies" actions above) Pg. 3-12			
Medium		Action #948: Enhanced conservation exceeding state requirements in selected communities (See Section 3.3.1).	<i>Lead:</i> Public Water System <i>Other:</i> Ecology, Conservation Districts	Low to Medium	<i>Main:</i> public water system <i>Additional:</i> Grants from DOH or Ecology
		Subaction #948A: Enhance current conservation efforts, with the goal of reducing the production required of existing wells. Pg 3-21	City of Battle Ground		
		Subaction #948B: Enhance current conservation efforts, with the goal of reducing the production required of existing wells, to protect flows in Gee Creek. Pg 3-22	City of Ridgefield (others: Ecology)		
		Subaction #948C: Enhance existing conservation program to reduce water diversions from Jones and Boulder Creeks. However, if source substitution is pursued instead, this may be unnecessary. Pg. 4-54	City of Camas		
		Subaction #948D: Enhance existing water conservation programs to protect stream flows. This may be unnecessary, however, if source substitution is pursued instead (see below). Pg. 4-41	City of Battle Ground, City of Ridgefield, Town of Yacolt		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
Medium		Action #949: Industrial supplies: Expand conservation & reuse; develop non-potable sources; connect to municipal systems (See Section 3.5.3).	<i>Lead:</i> Private industry (large plants) <i>Others:</i> Ecology & DOH (technical assistance; water rights processing if applicable)	Low to High (Varies by facility)	<i>Main:</i> Private industry <i>Additional:</i> Leg. Appropriations
		Subaction #949A: Where feasible, industries requiring additional sources of supply in the future should connect to existing municipal water supplies. Where not feasible due to technical issues, logistics, or cost, then it is recommended that the industry evaluate alternative sources as described in Section 3.3.1. Pg. 3-31	To Be Determined		
		Subaction #949B: New urban or suburban developments or industrial facilities that require new or expanded water supplies shall seek to obtain water from existing municipal or other water suppliers rather than developing separate sources of supply. (Note: this would not apply to agricultural uses). If an existing municipal supplier or other water supplier is not available, then the new development or industrial facility should explore water supply sources that are not in hydraulic continuity with surface water or explore the feasibility of developing tidal and/or Columbia River sources. If none of these options are available, Ecology may consider issuing water rights that entirely off-set the net impact to stream flow. Pg. 3-16	To Be Determined		
		Subaction #949C: Re-evaluate development of a non-potable Columbia River supply, considering the substantial amount of water used for industrial purposes in the City. The Planning Unit commits to aiding the City in identifying and obtaining funding sources for implementation of such a project, most likely through programs administered by Ecology and DOH (see Recommendation in Section 8.3). Pg. 3-20	City of Camas, Planning Unit (Ecology, DOH)		
		Subaction #949D: Provide technical assistance and financial support to Georgia Pacific in developing water conservation measures that would reduce dependency on surface water from Lacamas Creek and ground water from the lower Washougal River vicinity. Any ground water savings realized through conservation could be available to help meet the City's growth needs. Pg. 3-20	City of Camas, Georgia Pacific (others: Ecology, ?)		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #949E: Identify and carry out actions to reduce the impact of Georgia-Pacific's water use on Lacamas Creek. These actions may include a combination of source-substitution; water conservation; and/or water reclamation and reuse within the paper mill. The State of Washington should offer technical assistance for this purpose. In addition, the State of Washington should identify funding mechanisms that could, in part, contribute to reduction of water usage at the mill. Pg. 4-51	City of Camas, Georgia Pacific (others: Ecology, ?)		
		Subaction #949F: Develop technical assistance and funding opportunities focused specifically upon the needs of self-supplied industries, to aid in reducing current water demands. Pg. 3-31	Ecology, DOH		
		Subaction #949G: Evaluate development of Columbia River non-potable supplies, similar to that considered by the City of Camas. The Planning Unit commits to aiding industries in identifying and obtaining funding sources for implementation of such a project, most likely through programs administered by Ecology and DOH (see Recommendation in Section 8.3). Pg. 3-31	Self-supplied Industrial Water Users (others: Ecology, DOH)		
Low		Action #950 (#933): Consider the effects of individual domestic wells when modifying or adopting comprehensive plans, zoning designations, or other land use regulations. (See Section 3.5.2).	<i>Lead:</i> Counties, cities	Low	<i>Main:</i> counties, cities general fund, permitting fees, or grants
Low		Action #951 (#934): Agricultural supplies: switch from surface to ground water. Discourage new uses of surface water (use ground water instead) (See Section 3.5.4).	<i>Lead:</i> Landowner <i>Others:</i> Ecology, Conservation Districts	Low to medium	<i>Main:</i> Landowner <i>Additional:</i> Leg. Appropriations, USDA, NRCS
	High	Subaction #951A: Request change of existing surface water rights to ground water rights not in hydraulic continuity with surface waters. Pg. 3-33	Agricultural Water Users (others: Ecology)		
		Subaction #951B: Transfer ground water rights from one user to another to meet future agricultural water demands. Pg. 3-33	Agricultural Water Users (others: Ecology)		
		Subaction #951C: Expedite processing of agricultural ground water right transfers between agricultural water users. Pg. 3-33	Ecology		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #951D: Process water right requests pertaining to future agricultural ground water demand, subject to consistency with the Planning Unit's water supply policy (Section 3.3.1) and successful completion of Ecology's water right application review process. Pg. 3-33	Ecology		
Low		Action #952 (#935): Within authorities and as staffing and funding allow, develop water-level monitoring program for aquifers (See Section 4.2).	<i>Lead:</i> Water purveyors <i>Others:</i> USGS, counties	Medium	<i>Main:</i> Grants, water purveyor revenues
Category: Stream Flow Management					
High		Action #953: Maintain existing stream gauges. Install new gauges at selected locations. Select exact sites; permit and construct gauges; O&M; data management (See Section 4.2).	<i>Lead:</i> Ecology <i>Other:</i> USGS, LCFRB, Counties	Medium	<i>Main:</i> Leg. appropriations (Ecology budget); Congr. appropriations (USGS budget); <i>Additional:</i> Counties; Public Water Systems
		Subaction #953A: Maintain existing stream gauges over the long-term and install additional permanent stream gauges. Pg. 4-11, Pg. 4-46, Pg. 4-58	Ecology, USGS, Counties (others: ?)		
		Subaction #953B: Install stream gauges on the East Fork Lewis and Washougal Rivers. Pg. 4-46, Pg. 4-58	Ecology, USGS, Counties (others: ?)		
High		Action #954: Adopt restrictions on issuance of new water rights in State Rule (See Section 4.4.1).	<i>Lead:</i> Ecology <i>Other:</i> LCFRB	Low	<i>Main:</i> Ecology (staff time) <i>Additional:</i> LCFRB (staff time)
		Subaction #954A: Adopt State Rules (WACs) under the Instream Resources Protection Program to restrict issuance of new water rights in WRIs 27 and 28. In all affected streams reaches, establish a closure, but with certain exceptions as noted in the Plan. Pg. 4-19	Ecology (others: LCFRB, Planning Unit, ?)		
		Subaction #954B: Based upon the results of the analysis described in Section 3.5.2, and considering the relatively small amount of water withdrawals comprised by this category of water use, establish a reservation of water in rule language that provides for domestic well use, even within closed basins, subject to the considerations and limitations outlined in the plan (e.g., Sections 3.5.2 and 4.3.2). Pg. 3-28	Ecology (others: LCFRB, Planning Unit, ?)		
High		Action #955: Selected actions involving water supply and	<i>See Section 3.6</i>	<i>See Section 3.6</i>	<i>See Section 3.6</i>

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
		intended to protect stream flow. See water supply items listed above.			
		Subaction #955A: Develop a new wastewater treatment plant that uses Class-A Reclaimed water to augment streamflows, provided water quality in receiving waters is also maintained or improved. Pg. 3-22	City of Battle Ground (others: Ecology, DOH, ?)		
		Subaction #955B: Determine mitigation credits for stream flow augmentation resulting from the City of Battle Grounds new wastewater treatment plant. Mitigation credits should reflect net stream-flow benefits in relation to withdrawal impact areas. Pg. 3-22	Ecology, Fish and Wildlife, City of Battle Ground (others: ?)		
		Subaction #955C: Implement the 1992 Salmon Creek MOU and management plan, and review the policies discussed in Sections 4.5 and 4.6 to assess whether additional stream flow management strategies are warranted in the Salmon Creek Subbasin. Pg. 4-48	Ecology, Clark County, and Clark Public Utilities		
High		Action #956: Establish target flow monitoring and management program (See Section 4.3).	<i>Lead:</i> LCFRB and Planning Unit or successor organization <i>Other:</i> Ecology, DFW		<i>Main:</i> Phase 4 implementation funds <i>Additional:</i> TBD
		Subaction #956A: Develop a water-level monitoring program for aquifers in the region. Pg. 4-12	Ecology, Planning Unit (others?)		
		Subaction #956B: Establish target flows for the main stem of the East Fork Lewis River and Washougal River. Target flows should address both low flows and peak flows. The suite of flow-management techniques discussed for these streams should be designed with the goal of protecting these flows from degradation; and if possible improving the flow regime. (Tasks would include gauge installation, establishment of target flows, monitoring, etc) (See the following sections for more detailed specifications on recommended actions) Pgs. 4-43 through 4-57 and 4-56 through 4-58	Ecology, Planning Unit (others? USGS?)		
High		Action #957: Initial surveys in selected subbasins to identify unauthorized uses and take enforcement actions. Follow-up in other basins if warranted (See Section 4.4.6).	<i>Lead:</i> Ecology <i>Other:</i> N/A	Low to medium	<i>Main:</i> Leg. appropriations (Ecology budget & staffing) <i>Additional:</i> N/A

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #957A: Conduct or support initial surveys in selected subbasins to determine whether unauthorized water uses are occurring on streams deemed critical to salmon recovery within WRIAs 27 and 28. If these surveys identify extensive unauthorized uses, they should be expanded to additional subbasins and carried out on a regular, periodic basis (e.g. once every five years). Pg. 4-27	Ecology (others?)		
		Subaction #957B: Where unauthorized uses are identified based upon initial surveys, take enforcement actions to eliminate these uses. An alternative or additional approach would be the establishment of a watermaster that has regulatory authority to regulate illegal water diversions. Pg. 4-27	Ecology (others?)		
High		Action #958 (#936): Consider and address effects of forest practices on stream flow. Monitor effectiveness of F&F Rules and NW Forest Plan. Report to public periodically (See Section 4.5.1).	<i>Lead:</i> DNR, USFS, Ecology, WDFW <i>Other:</i> Private forest landowners	Low to medium	<i>Main:</i> Leg. appropriations (DNR budget); Congr. appropriations (USFS budget), Timber producers <i>Additional:</i> N/A
		Subaction #958A: Consider effects of forest management practices on stream flow and other fish habitat factors, in making forest management decisions. The Planning Unit anticipates that existing programs under the State's Forests and Fish regulations DNR's Habitat Conservation Plan, and the federal government's Northwest Forest Plan will provide the regulatory framework needed in this regard. Pg. 4-29	<i>Lead:</i> DNR, USFS, Ecology, WDFW <i>(Other:</i> Private forest landowners)		
		Subaction #958B: Analyze and document the effects of planned timber harvesting on stream flow. Pg. 4-29	<i>Lead:</i> DNR, USFS, Ecology, WDFW <i>(Other:</i> Private forest landowners)		
		Subaction #958C: Monitor the effectiveness of these programs and periodically provide public documentation of their effectiveness in protecting fish habitat, including flow conditions, in WRIAs 27 and 28. Hold public meetings to discuss the effects of forest activities. Pg. 4-29	<i>Lead:</i> DNR, USFS, Ecology, WDFW <i>(Other:</i> Private forest landowners)		
		Subaction #958D: Integrate monitoring of forest practices programs into the LCFRB Research, Monitoring and Evaluation (RME) program. Pg. 4-29	LCFRB		
High		Action #959: Within authorities, protect floodplains from modifications that would impair hydrologic functions or habitat (See Section 4.5.3).	<i>Lead:</i> Counties, cities, State agencies with land	Low	<i>Main:</i> County permitting fees or general fund revenues, grants

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
			management responsibilities <i>Other:</i> DFW		<i>Additional:</i> State agency budgets
		Within authorities, local jurisdictions and state agencies with land-management responsibilities should protect existing floodplains from modifications that would impair their hydrologic functions and habitat value. Pg. 4-32			
Medium		Action #960: Review effects of stormwater discharges on stream flow and habitat. Where needed to protect key habitat, implement programs that exceed minimum requirements (See Section 4.5.2).	<i>Lead:</i> Counties, Cities <i>Other:</i> Ecology	Low to Medium	<i>Main:</i> County, City general funds; Stormwater assessment and fees, grants <i>Additional:</i> N/A
	High	Subaction #960A: Carry out legally mandated responsibilities with regard to stormwater management. Pg. 4-30	Clark County, Cowlitz County, and the Cities of Vancouver, Camas, Washougal, and Battle Ground		
	High	Subaction #960B: Review stormwater management ordinances to determine whether they are adequately protective of fish habitat in local streams that may be affected by future development. Where enhanced stormwater management needs are identified, revisions to local ordinances should be considered in light of the guidance and BMPs provided in Ecology's Manual. The focus should be on upgrading development practices and mitigation requirements in areas where stream flow and fish habitat may be compromised as development occurs. Costs, expected magnitude of benefits, and feasibility considerations should be included in this review. Pg. 4-30	North Bonneville, Yacolt, Ridgefield, LaCenter, Woodland, and Kalama (others? – plan states “all remaining cities in Cowlitz, Clark and Skamania County)		
	High	Subaction #960C: Voluntarily consider developing a stormwater management ordinance. Pg. 4-30	Skamania County		
Medium		Action #961: Purchase or lease of water rights from willing sellers, for State Trust program (See Section 4.4.5).	<i>Lead:</i> Ecology <i>Other:</i> N/A	Low to medium	<i>Main:</i> Leg. appropriations (Ecology budget) <i>Additional:</i> N/A

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #961A: Use the existing State Trust program, and funding provided by the State Legislature, to identify and acquire water rights from water users willing to sell or donate their water rights in WRIAs 27 and 28, where transfers to the State Trust would provide a significant benefit to fish habitat. Pg. 4-27	Ecology, Washington Water Trust		
		Subaction #961B: If source substitution is pursued and if water rights are no longer needed for primary or backup supply, consider transferring water rights to the State Trust. Pg. 4-42	Battle Ground, Ridgefield, Yacolt and Camas		
		Subaction #961C: If the City of Camas reduces or eliminates diversions from Jones and Boulder Creeks, and if these water rights are no longer needed for primary or backup supply, they could potentially be transferred to the State Trust. Pg. 4-55	City of Camas		
Medium		Action #962 (#937): Within authorities, identify floodplain restoration projects and implement where feasible (See Section 4.5.3).	<i>Lead:</i> Counties, cities, State agencies with land management responsibilities <i>Other:</i> DFW	Medium to High	<i>Main:</i> State or federal grants; Leg. Appropriations <i>Additional:</i> N/A
		Subaction #962A: Identify floodplain restoration projects, subject to local input, cost-benefit analysis, and availability of funding. Where these factors are favorable, and where substantial benefits to flow or other habitat factors are identified, these projects should be pursued for implementation. Pg. 4-32	Counties, cities, State agencies with land management responsibilities (others?)		
		Subaction #962B: Coordinate with the Watershed Stewards Program to identify any actions it may take to aid in the Gee Creek restoration effort. Pg. 3-24	City of Ridgefield		
Medium		Action #964 (#939): Large water users and hydropower facilities: short-term drought response curtailment programs, to protect stream flows (See Section 4.4.7).	<i>Lead:</i> Selected public water systems; hydropower operators <i>Other:</i> N/A	Low to medium	<i>Main:</i> Large water users and hydropower facilities <i>Additional:</i> N/A

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #964A: Where major surface water diversions or ground water withdrawals have a direct effect on stream flows on a time scale of weeks or less, the water user should consider adopting voluntary procedures to alter operations in the event of a State-declared drought emergency affecting WRIAs 27 and/or 28. The water user should adopt policies and procedures in advance, to allow for quickly altering operations to minimize or eliminate the depletion of stream flow to the extent feasible in the event such a drought occurs. Pg. 4-14, Pg. 4-25	Selected public water systems – To Be Determined		
		Subaction #964B: Identify small surface water users that could implement this type of management strategy to improve low flow conditions (see above). Pg. 4-25	Planning Unit, Ecology (others?)		
		Subaction #964C: Develop a curtailment plan to reduce diversions from Jones and Boulder Creeks in the event of a state-declared drought emergency. (This approach would not be needed, if an alternative source is developed to replace these diversions.) Pg. 4-54	City of Camas		
Medium		Action #968: Evaluate the need to take additional actions addressing shallow aquifer interactions (See Section 4.5.5).	<i>Lead:</i> Planning Unit or successor organization <i>Other:</i> N/A	Low	<i>Main:</i> Phase 4 implementation funds <i>Additional:</i> TBD
		Evaluate the need to take additional actions to prevent disruption of shallow aquifer recharge, subsurface flow patterns, and aquifer discharge that support the stream flow regime in low flow periods. Pg. 4-33			
Medium		Action #969: Develop clear guidance for mitigation (See Section 3.3.1).	<i>Lead:</i> Ecology <i>Other:</i> N/A (others?, WDFW, Planning Unit)	Low	<i>Main:</i> Leg. Appropriations (Ecology budget) <i>Additional:</i> N/A
		Develop clear guidance for mitigation for use by water rights applicants. An existing Ecology document listing examples of mitigation can be used as a starting point. Pg. 4-62			
Low		Action #965 (#940): When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, consider the water balance implications of allowing extension of sewer service to communities formerly served by septic systems (See Section 4.5.2).	<i>Lead:</i> Counties, Cities <i>Other:</i> sewer agencies if different from Counties,	Low	<i>Main:</i> Counties, Cities general funds, permitting fees, grants <i>Additional:</i> N/A

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
			Cities.		
		When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, jurisdictions should consider the water balance implications of allowing extension of sewer service to developing areas. The Planning Unit recognizes that provision of sewer service can provide substantial water quality benefits. However, where sewer service is extended to replace septic systems, and residents continue to rely on water wells, stream flows may be reduced. This effect should be anticipated and mitigated where applicable. This is particularly important in areas with relatively dense development near small streams. Pg. 4-31			
Low		Action #966 (#941): Water conservation by farmers practicing irrigated agriculture. Technical assistance by Conservation District in each county (See Section 4.4.2).	<i>Lead:</i> Agricultural producer <i>Other:</i> Conservation Districts	Medium	<i>Main:</i> Agricultural producer <i>Additional:</i> Leg. Appropriations (Cons. Commission & CD budgets).
		Subaction #966A: Where there would be significant benefits to stream flows, practice water conservation actions. Pg. 4-24	Agricultural Producer		
		Subaction #966B: Provide technical assistance to farmers to identify water conservation opportunities and funding sources. Pg. 4-24	Conservation District		
Low		Action #967: Source substitution for selected areas served by domestic wells: relatively higher densities and likelihood of stream impacts; dependent on feasibility and cost (See Section 4.4.4).	<i>Lead:</i> Counties, cities, local governments, Ecology, and/or others as appropriate. <i>Other:</i> Public water systems, landowners	Medium to high	<i>Main:</i> Assessments on affected properties (local improvement districts), grants <i>Additional:</i> Federal and State salmon recovery funding; Leg. appropriations
		Communities using water sources (surface or ground water) that significantly reduce base flows in any stream that provides important fish habitat within WRIAs 27 and 28 should consider alternative sources of supply that eliminate or minimize these effects. It is anticipated that this would require examination of cost, potential rate impacts, reliability considerations, and evaluation of other feasibility criteria. In limited cases, this policy may apply to rural areas where			

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		residents rely on domestic wells (exempt wells). When modifying or adopting comprehensive plans, zoning designations, or other land use regulations, Clark and Cowlitz counties, cities, local governments, Ecology, and/or others as appropriate should assess this possibility through a water-balance analysis, in selected rural areas where extensive new development is expected to occur or where there is substantial existing development served by exempt wells. The intent is to explore solutions for small creeks where a large number of existing domestic wells may deplete stream flows. Under the right circumstances, if a different source could be used to replace individual wells, effects on stream flow could potentially be reduced or eliminated. Local community views should be included in this process. Pg. 4-26			
Medium		Action #963 (#938): Wetlands inventories and ordinances: assess and protect hydrologic functions, consider strengthening mitigation ratios (See Section 4.5.4).	<i>Lead:</i> Counties and Planning Unit <i>Other:</i> N/A		<i>Main:</i> County development fees or general fund revenues (note staffing impact), grants <i>Additional:</i> N/A
		Subaction #963A: In conjunction with the Planning Unit, Counties should explore funding opportunities for conducting a county-wide wetland assessment that includes evaluation of hydrological functions. Pg. 4-33	Counties, Planning Unit		
		Subaction #963B: Require evaluation of hydrological function as part of any site-specific wetland assessments conducted under their critical areas, wetland or other land use ordinances. Pg. 4-33	Counties		
		Subaction #963C: Modify wetlands ordinances as needed to include hydrologic functions in the wetland protection hierarchy. Pg. 4-33	Counties		
		Subaction #963D: Review and consider strengthening mitigation ratios, for selected wetland areas that offer significant hydrologic functions or other fish habitat benefits. Pg. 4-33	Counties		
Category: Surface Water Quality					
Medium		Action #970: Develop water body cleanup plans (TMDLs) for subbasins, in prioritized sequence as indicated in Watershed Management Plan. Carry out necessary modeling, reporting, public involvement, and waste load	<i>Lead:</i> Ecology <i>Other:</i> Local governments, Conservation	High	<i>Main:</i> Leg. appropriations (Ecology budget) <i>Additional:</i> N/A

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		allocations (See Section 5.3.2).	Districts, other interested parties		
		The Planning Unit recommends that Ecology develop TMDLs according to the priority list shown in Table 5-3. At such time as the 2002/2004 303(d) list is approved by Ecology and EPA, these priorities should be revisited. Pg. 5-11			
Medium		Action #971: Within authorities, develop full-scale assessment strategy for non-point sources (See Section 5.5).	Lead: counties <i>Other:</i> Ecology, conservation districts, USFS, DNR	Low	Phase 4 implementation Grant
		Subaction #971A: Develop a detailed assessment strategy for WRIAs 27 and 28 to identify sources of water quality impairment (specific sites or areas). (See Pg. 5-18 for specific tasks). Pg. 5-17, Pg. 5-18	Counties, Ecology, Conservation Districts (others?)		
		Subaction #971B: Following completion of the strategy, seek funds to carry out this assessment and take corrective actions where needed. Pg. 5-17, Pg. 5-18	Counties, Ecology, Conservation Districts (others?)		
Medium		Action #972: Within authorities, carry out source assessment of non-point sources (See Section 5.5).	Same as above	Medium	TBD, (combination of State, federal, and local sources)
Medium		Action #973: Actions to correct sources of impairment (See Section 5.5) (specifics to be determined, pending outcome of assessment above). Pg. 5-17	<i>Lead:</i> Party causing impairment <i>Other:</i> Ecology, conservation districts	Medium to High	TBD (combination of State, federal, local and private sources)
Low		Action #974: Within authorities and as staffing and funding allow, expand water quality monitoring activities to improve understanding of status and trends. Install monitoring equipment; collect and analyze samples; manage and analyze data; report results (see Section 5.4.2).	Shared efforts by State, local, federal agencies Ecology will take lead in promoting cooperative arrangements among agencies	High	Combination of State, local, federal funding sources (to be developed further in Implementation Phase)
		Subaction #974A: Secure funds to implement the Water Quality Analysis Plan (WQAP) outlined in Section 5.4.2 (Barber, 2004 Technical Memorandum). Pg. 5-14	To Be Determined		
		Subaction #974B: Implement program Implement the WQAP outlined in Section 5.4.2 (Barber, 2004 Technical Memorandum). Pg. 5-14	To Be Determined		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		Subaction #974C: Monitor water temperature in various streams and rivers. Section 5.4.2	To Be Determined		
		Subaction #974D: Document the effects of forest practices on water quality in annual monitoring reports. Section 5.4.2	To Be Determined		
Category: Ground Water Quality					
High		Action #975: Within authorities, improve public awareness of ground water quality issues. Information outlets. Mass-media campaign. Schools program. Public opinion surveys (See Section 6.5.1).	<i>Lead:</i> County health departments <i>Others:</i> Cities, DOH.	Medium	<i>Main:</i> grants Substantial staffing needs
		The Planning Unit recommends that steps be taken to improve public understanding and awareness of issues related to drinking water quality (6-13)			
		Subaction #975A: Provide outlets for ground water protection information... Pg. 6-13			
		Subaction #975B: Develop a mass media campaign for ground water protection... Pg. 6-13			
		Subaction #975C: Make available and/or coordinate with a ground water protection program for schools... Pg. 6-14			
		Subaction #975D: Conduct periodic public opinion surveys related to ground water protection efforts... Pg. 6-14			
High		Action #976: Within authorities, assess susceptibility of ground water supplies to contamination. Risk assessment. Evaluate data management and improve if necessary. Regional mapping (See Section 6.5.2).	<i>Lead:</i> County health departments <i>Others:</i> Cities, Ecology, DOH.	Low to Medium	<i>Main:</i> grants Substantial staffing needs
		The Planning Unit recommends that steps be taken to assess susceptibility of ground water supplies to contamination on a regional basis... Pg 6-13			
		Subaction #976A: Conduct Risk Assessment... Pg. 6-15			
		Subaction #976B: Evaluate existing data management system and improve system if necessary... Pg. 6-18			
		Subaction #976C: Produce regional maps showing results of the risk assessment... Pg. 6-18			
Medium		Action #977: Within authorities, improve local wellhead protection. Determine which Group A Systems have wellhead program. Apply technical assistance and enforcement to meet state requirements. Facilitate use	<i>Lead:</i> DOH and County health departments <i>Others:</i> Public water	Medium to High	<i>Main:</i> Grants Substantial staffing needs

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
		of computer modeling. Encourage Group B systems to voluntarily establish wellhead programs (See Section 6.5.3).	systems		
		The Planning Unit recommends that steps be taken to improve local wellhead protection programs... Pg 6-13			
		Subaction #977A: Determine which Group A public water systems have a Wellhead Protection Program and enforce Wellhead Protection Program requirements... Pg. 6-20			
		Subaction #977B: Facilitate use of a computer model for delineating select Group A PWS wellhead protection areas... Pg. 6-20			
		Subaction #977C: Encourage Group B PWSs to voluntarily establish a Wellhead Protection Program. Group B PWSs are not required to do any wellhead protection planning under current regulations... Pg. 6-20			
Low		Action #978: Within authorities, coordinate and promote management strategies to prevent impacts to ground water quality from land use activities (See Section 6.5.4).	<i>Lead:</i> County health departments <i>Others:</i> County planning departments, conservation districts, Ecology, Wash. Dept. of Agriculture, NRCS	Medium to High	<i>Main:</i> Grants Substantial staffing needs
	High	Subaction #978A: Take steps to implement management strategies to minimize impacts of land use activities on ground water supplies. Pg. 6-13	County health departments, county planning departments, conservation districts, Ecology, Wash. Dept. of Agriculture, NRCS		
	High	Subaction #978B: Coordinate and promote management strategies... Pg. 6-22	County health departments, county planning departments, conservation districts, Ecology, Wash. Dept. of Agriculture, NRCS		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/Economic Costs ⁽³⁾	Potential Funding Sources
Low		Action #979: Within authorities, clean up sources of ground water contamination. Evaluate need for greater involvement by local organizations. Evaluate need for independent cleanup actions outside Ecology programs (See Section 6.5.5).	<i>Lead:</i> County health departments <i>Others:</i> Ecology, Public Water Systems, Wash. Dept. of Agriculture	Medium to High	<i>Main:</i> Grants
		Subaction #979A: Evaluate the need for greater involvement by local organizations as stakeholders in clean up actions at Ecology regulated facilities and sites... Pg. 6-24			
		Subaction #979B: Evaluate the need for independent clean up actions. Some land use activities that have contributed to ground water contamination cannot be easily assigned to responsible parties... Pg. 6-24			
Category Adaptive Management					
To Be Prioritized		Action: Develop Adaptive Management Program in accordance with Section 8.7.3. This program would addresses all actions specified in the DIP, and would be integrated with the Recovery Plan Monitoring, Research and Evaluation Program. Tables 8-3 and 8-4 specify the plan elements and associated priorities, performance metrics, and management responses and triggers. Pg. 8-16	LCFRB, Planning Unit, Ecology (Others)		
Category: Coordination and Oversight					
To Be Prioritized		Action: In order to provide a venue for these activities, transition the WRIAs 27 and 28 Planning Unit from planning functions to coordination and oversight functions. The purpose is to foster an organized and collaborative approach, as many individual organizations carry out specific actions under their jurisdictions, and to secure funding for implementation. Pg. 8-3	LCFRB, Planning Unit		
To Be Prioritized		Action: Continue to provide staff resources to support the Planning Unit in this activity. Funding for these purposes can be based on the State Phase 4 grants for the first five years of the implementation phase. Pg. 8-3	LCFRB		
To Be Prioritized		Action: Prepare an interlocal agreement to define coordination and oversight responsibilities. Such an agreement may also be beneficial in further defining other implementation commitments	LCFRB, Planning Unit		

Priority ⁽²⁾	Sub-priority	Activity	Implementers ⁽⁴⁾	Financial/ Economic Costs ⁽³⁾	Potential Funding Sources
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		among the organizations involved, beyond the level of detail presented in this Plan. Pg. 8-3			
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⁽²⁾ Priority in context of all actions in Watershed Management Plan.

⁽³⁾ Preliminary, generalized estimates of financial or economic cost of the action. Expressed as total cost, whether up-front or over a period of time up to ten years. High: greater than \$500,000; Medium: \$50,000 to \$500,000; Low: less than \$50,000.

⁽⁴⁾ “Lead” implementer would take responsibility for organizing efforts under this action, including pursuing funding sources listed in the far right column. Lead and support roles will vary depending on jurisdiction and geographical area.

Abbreviations: SEPA = State Environmental Policy Act, DOH = Department of Health, Leg. = Legislative

Appendix C
Salmon-Washougal and Lewis Watersheds
Inchoate Water Rights Assessment

Appendix C Inchoate Water Rights Assessment

Task 2-1: Screening Process for Review of Inchoate Water Rights¹

1.0 Introduction

An inchoate water right is defined as a portion of a water right that has not been fully put to use, or “perfected” under Washington State’s water code. Under RCW 90.82.048, watershed planning units throughout Washington State are required to assess municipal inchoate water rights under the Implementation phase (Phase 4) of the watershed planning process. Specifically, the planning units are required to assess the planned future needs identified in the watershed plan and how the use of these inchoate water rights will be addressed when implementing instream flow strategies identified in the watershed plan.

This task is designed to build upon the work completed by the Planning Unit during prior phases of watershed planning in WRIAs 27 and 28. The limited work effort is intended to identify any major risks and new challenges posed by development of inchoate water rights not already anticipated in the existing Watershed Management Plans. Generally, the full inchoate water rights review is comprised of three main parts:

- (i) Identify potential municipal inchoate water rights posing the highest risk for stream flow;
- (ii) Review a selected set of these rights to evaluate this risk further and prepare data sheets summarizing pertinent information; and
- (iii) Provide recommendations to LCFRB and the Planning Unit on how these inchoate water rights should be addressed in the Detailed Implementation Plan.

The purpose of this memo is to document the first step in this review – screening the full list of municipal water providers and municipal-type water rights in the watersheds to identify the potential inchoate water rights that could pose a risk to instream flow objectives. For the purposes of this screening, “municipal water providers” may also include other non-municipal entities that provide water that can be used for municipal-type purposes as defined under RCW 90.03.015. This memo provides the “short-list” of priority water rights owners to be reviewed in further detail for parts (ii) and (iii) of this process. Attachments (A-1, A-2 and A-4) to this memo provide the full list of water rights and Group A systems reviewed.

2.0 Information Sources and Screening Process

Data requests were made for municipal-type water rights and Group A water system information from the Department of Ecology (Ecology) and Department of Health (DOH), respectively. Ecology was asked to provide all water rights for municipal supply (per definition in RCW 90.03.015) within WRIAs 27 and 28. The request from DOH was for all Group A water systems in the WRIAs. The basis for the information (spreadsheet output) provided by the two agencies are summarized in **Table 1**. The information gathered was also compared with information compiled previously and documented in the Watershed Management Plan.

¹ HDR Memo #1, 8/7/07

Table 1. Water Rights and Group A System Data Request Summary			
Agency	Data Request Criteria	Data Fields Provided	Contact
Water Resources Program Washington State Department of Ecology	- Both permits and certificates - Type of use to include municipal and multiple domestic type uses (Ecology also included water rights with “municipal intertie” and “other uses” applicable to Group A systems) - Point of diversion/withdrawal located within WRIAs 27 and 28.	- File number - Certificate number - Owner - Status (active) - Document type (permit/certificate/new application) - Priority Date - Purpose/type of use - Instantaneous rate (Qi) - Annual quantity (Qa) - Irrigated acres - WRIA - Location (township-range) - Source of water - Total Number of Records: 549	- Shawn Hopkins (360-407-6523) - Mary Lynum (360-407-6859)
Office of Drinking Water Southwest Region Washington State Department of Health	All Group A systems located within WRIAs 27 and 28.	- System name - Status (active/inactive) - Number of connections - DOH-approved connections - WRIA - Total Number of Records: 126	Linda Kildahl (360-236-3038)

The screening process is based on three primary factors that provide a measure of the potential for any inchoate water right to compromise instream flow management objectives:

- Size of the water right – the instantaneous flow rate (Qi) is used as the basis for the size of the water right.
- Location of the water right (point of diversion/withdrawal) – location relative to high priority subbasins/streams for managing stream flow.
- Size (flow rate) of affected water body – considered secondary to the two previous factors; this factor is implicitly accounted for in the second factor above (location relative to high priority stream).

The size of the water right is important because: (i) there is a greater likelihood that a significant inchoate portion exists; and (ii) there is a greater likelihood that instantaneous diversions or withdrawals will impact the stream flows. A small water right could also have an inchoate portion, but the potential impact to stream flows would also be relatively small.

With respect to the location factor, the Watershed Management Plans included a list of the highest priority subbasins or streams/tributaries for managing instream flows. These priorities were developed with the Planning Units during preparation of the watershed plans in conjunction with the Salmon Recovery Plans for the WRIAs. **Table 2** lists the highest priority subbasins/streams for WRIAs 27 and 28 as documented in the Watershed Management Plan.

The size (or quantity) of flow in the affected water body is also an important factor. However, one issue with using this factor is that most of the streams and tributaries do not have measured stream flow data available. Secondly, the Planning Units have implicitly accounted for the size of the stream when the stream/subbasin priorities were developed in the Watershed Plan. Nevertheless, in situations where two water rights of similar size are both in high priority subbasins, the water right associated with the smaller stream would be “ranked” higher because it is likely to pose a greater impact on stream flows.

Table 2. Highest Priority Subbasins for Streamflow Management	
Priority Basin	Basis for Priority
East Fork Lewis River	Value for habitat; development in lower basin; relatively low flows in summer need protection
Washougal River	Value for habitat; development in lower basin; relatively low flows in summer need protection
Lower end of Lacamas Creek	Existing impairment and development pressure; importance as Chum habitat
North Fork Lewis River (focus on Cedar Creek and other tributaries)	Value for habitat; development activity
Hamilton Creek and Greenleaf Creek	Value for habitat; low summer flows – both streams go dry in the summer months

In applying the two primary factors it should be kept in mind that a “small” water right immediately adjacent to a high priority stream may be more critical than a “large” water right near a stream where stream flows are not an issue. The most critical water rights are those located within a high priority subbasin or adjacent to a high priority stream and where the ratio of size of water right to natural stream flow are largest (i.e. most potential impact to the stream). It should also be kept in mind that a large water right or large Group A system does not necessarily imply that an inchoate water right exists. The screening simply indicates a greater likelihood that a more significant inchoate water right is associated with these systems or water right owners.

The focus of the screening process was on the water rights data because it had more readily available and reliable location information (township-range-section). In addition, the location information is based on point of diversion/withdrawal (POD) rather than place of use as the case with the Group A system information. After screening the water rights data, the listed water rights owners were compared with the Group A system information provided by DOH to identify any Group A systems not included in the water rights listing. A decision can then be made whether to include the Group A system in the short-list for further evaluation.

As related to the key screening factors, several steps were involved in the screening process. **Figure 1** shows a flow chart of the screening process. The steps are listed below:

1. Group water rights by WRIA and by surface water and ground water rights.
2. Remove all “new application” water rights. New applications have no status (or right) to use any water and the primary effort is to see what the impacts would be if all the existing “paper water rights” were exercised. The remaining water rights for consideration only include permitted or certificated rights.
3. Remove all water rights that do not have at least one of the following types of use: municipal, multiple domestic, general domestic, commercial/industrial. The definition of municipal-type use as defined in RCW 90.03.015 is fairly broad, so any specific water rights that may potentially fall into this definition are retained.

4. Sum the total instantaneous rate of each water right (Q_i) for owners with multiple water rights (ground water and surface water rights summed separately). The water rights are summed noting the actual points of diversion/withdrawal. Water rights that have the same owner but whose points of diversion are not within the same township-range-section are listed separately.
5. Remove all water rights that have an instantaneous rate (Q_i) (or total rate for owners of multiple rights) of 0.10 cfs or smaller. This rate was selected because it is considered a relatively minor impact to measured streamflows in most tributaries in these WRIs. (For comparison, a single residence is typically allowed an instantaneous use rate of 10 gpm, or 0.02 cfs).
6. Rank (descending order) the remaining water rights by size of Q_i .
7. Locate the remaining water rights relative to the highest priority subbasins/streams for streamflow management. Those water rights within the same high priority subbasin are retained.
8. Locate the remaining water rights above areas with tidal influence (based on watershed plan designations) and remove from consideration any water rights located within the zone of tidal influence. The zones of tidal influence were excluded from stream flow management actions under the Watershed Plans.
9. Relate the Group A system list to the remaining water rights for consistency and identify any system(s) that may not be accounted for by the water rights screening.

The screening process outlined above involves some judgment as to where the “cut-off” should be applied. The advantage of using this process is that the short-list can be evaluated qualitatively to decide the risk or benefit of not including a specific water system in the context of the basin priorities and relative to other systems that are retained for further consideration.

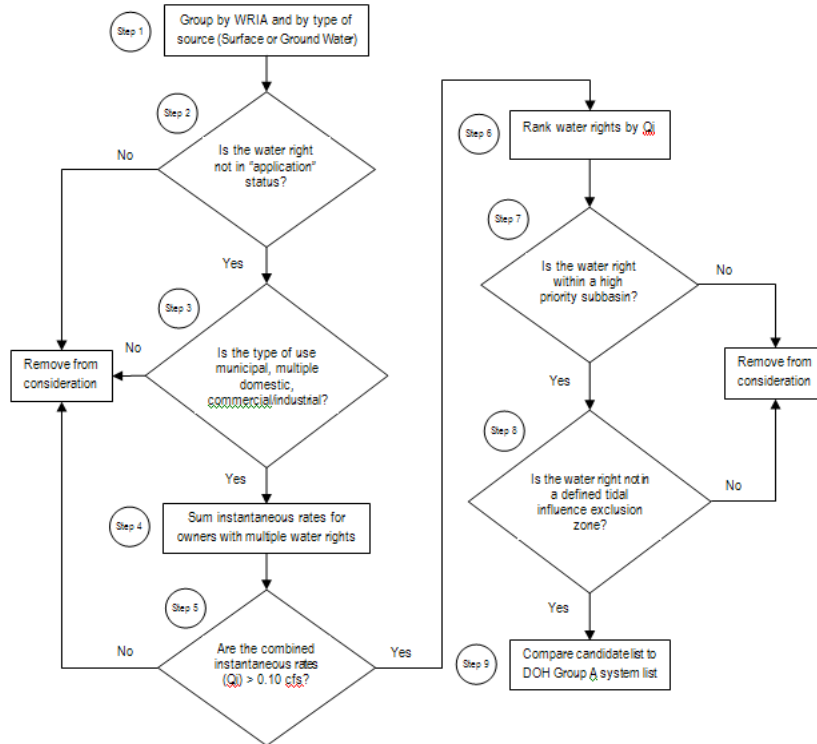


Figure 1. Flow Chart of Screening Process

3.0 Screening Results

A summary of the screening results is presented below. Screening results are provided in Attachments A-1, A-2 and A-3. After applying screening Steps 7 and 8, the original water rights information provided by Ecology reduced the number of “water rights owners” to 50 for WRIAs 27 and 28, respectively (see Attachment A-3). These water rights are considered the “candidate list” for detailed evaluation. The initial list of individual water rights totaled 549. Additional qualitative screening was applied to the candidate list to further reduce the number of water rights/owners based on risk to stream flow management objectives.

The largest municipal water rights are owned by the City of Vancouver and Clark Public Utilities. The City of Vancouver has ground water rights located in the Burnt Bridge Creek subbasin. Since they are not located in a high priority subbasin, these rights were removed from further consideration as a priority water right for review. CPU also owns ground water rights, some of which are located within a high priority subbasin. Therefore, CPU was retained for further consideration. Kalama, Woodland and North Bonneville were removed from further consideration as a priority water right for review because their water rights are not within high priority subbasin areas include.

Municipalities with water rights within the high priority subbasins include: Ridgefield, La Center and Yacolt in WRIA 27; and Camas, Battle Ground, and Washougal in WRIA 28. Of these communities, the Watershed Plan granted a water right reservations for CPU, Ridgefield, Camas and Battle Ground. This implies that the Planning Unit has generally accounted for the need to demonstrate responsible management of the resource, and would require mitigation in developing new supplies. Therefore, although these are some of the larger water rights in the candidate list, the communities with water rights reservations are not recommended as priorities for detailed review.

Based on these considerations, La Center, Yacolt and Washougal are proposed for detailed review. **Table 3** identifies these three communities for the short list (“First Tier”) of proposed water rights owners/water providers for detailed review for inchoate water rights.

Table 3. Proposed Short-List of Water Providers for Detailed Review of Inchoate Water Rights			
Water Providers	Type of Use	Instantaneous Rate (cfs)	Source
WRIA 27			
Town of La Center	MU	2.67	Ground Water
Town of Yacolt	MU	0.94	Ground Water
WRIA 28			
City of Washougal	MU	3.34	Ground Water

Notes: Cfs – cubic feet per second; DM – Multiple domestic use; FR – Fire protection use; IR – Irrigation use; MU – Municipal use

Table 4 lists the “Second Tier” priority water rights, which include the smaller water rights identified within the high priority subbasins. These water rights are likely for small developments (or trailer parks). Some of the larger water rights for private/commercial use were also removed because a major portion of the right is likely used for irrigation or industrial use and not for Class A municipal use. Most of these rights were less than 0.5 cfs and ground water was typically the source. The main uncertainty associated with eliminating these water rights is

the potential cumulative impact they could have within any given drainage area or subbasin on streamflows. Besides the listed rights in Table 4, there are other even smaller water rights that add to the potential cumulative impact, which are not shown. These subbasins may need to be considered further with input from the Planning Unit, however it was beyond the scope of this review to conduct a full mapping exercise to calculate cumulative instantaneous rates by drainage area.

Table 4. Proposed Second Tier Water Rights Owners for Detailed Review of Inchoate Water Rights			
Water Providers	Type of Use	Instantaneous Rate (cfs)	Source
Foothills Service Co	Domestic	0.60	Ground Water
Hoffman & Edwards	Domestic	0.53	Ground Water
Beacon Lake Corporation	Irrigation/Domestic	0.50	Beacon Cr *
Randolph F Et Al	Irrigation/Domestic	0.49	Ground Water
Lake Merwin Development Co	Domestic	0.39	Ground Water
Woodside Merry	Domestic	0.36	Ground Water
Skamania Landing Owners Association	Domestic	0.33	Ground Water
Parkside Development Inc	Domestic	0.32	Ground Water
BUHMAN W	Domestic	0.29	Ground Water
ENGLEMAN C L	Domestic	0.27	Ground Water
Bradshaw & Blake	Domestic	0.23	Ground Water
Country Manor Mobile Village Inc	Domestic	0.22	Ground Water
SLOSAR JOE ET UX	Domestic	0.22	Ground Water
Bowcutt Kenneth L	Domestic	0.20	Unnamed Spring
WA Health Department	Domestic	0.18	WELL (Multiple)
Stout James C	Fire Protection/Domestic	0.16	Riley Creek
Huennekens Travis	Irrigation/Domestic	0.16	Ground Water
Eno P E Et Al	Irrigation/Domestic	0.13	Ground Water
Balint Charlotte E	Irrigation/Domestic	0.13	Ground Water
Livingston Mountain Homeowners Assn Inc	Domestic	0.13	Ground Water
Mcbain * Hockinson	Domestic	0.13	Ground Water
Barnard Wilma Et Al	Stock/Domestic	0.12	Ground Water
Cole H Robert Et Ux	Domestic	0.12	Ground Water
Norris Jerome Et Ux	Irrigation/Domestic	0.11	Ground Water
Coonrod & Modrell	Irrigation/Domestic	0.11	Ground Water
Moll L H	Domestic	0.11	Ground Water
Falk I R	Stock/Domestic	0.11	Unnamed Stream
WA Department Of Fish & Wildlife	Domestic	0.11	Ground Water

Table 5 lists other potential candidates ("Third Tier") for detailed inchoate water rights review. **Table 5** also notes the reason for not including them in the proposed First Tier or Second Tier list. Generally, the water rights owners included in the Third Tier are those with larger water rights, but are not located within the high priority subbasins. Others on this Tier 3 list may also be removed since a significant portion of the water right is not likely for municipal use (e.g. power, fire protection, fish propagation). For completeness, the four large municipal water rights

holders granted water rights reservations in the Watershed Plan, are also included in this Third Tier list. There are fifteen Third Tier water purveyors in WRIs 27 and 28.

Table 5. Other Candidate Water Providers for Detailed Review of Inchoate Water Rights (Third Tier)				
Water Right Owner	Type of Use	Instantaneous Rate (cfs)	Source	Reason for Second Tier
WRIA 27				
Weyerhaeuser Timber Co	Group domestic	15	Unnamed Spring	Large water right, but not in high priority subbasin; significant portion of water right is not likely for municipal use
City of Ridgefield	Municipal	3.37	Ground Water	Large municipal right, but granted a water right reservation in Watershed Plan
C.R. Zehntbauer	Power, multiple domestic	3.5	Knowlton Creek	Large water right, but not in high priority subbasin
City of Woodland	Municipal	2.78 (SW) 8.02 (GW)	Lewis River Ground Water	Large water right, but not in high priority subbasin;
WRIA 28				
City of Vancouver	Municipal	208.6	Ground Water	Large water right, but not in high priority subbasin
Clark Public Utilities	Municipal	66.45	Ground Water	Large municipal right, but granted a water right reservation in Watershed Plan
City of Camas	Municipal	3.50 20.0	Boulder and Jones Cr. Ground Water	Large municipal right, but granted a water right reservation in Watershed Plan
Federal Highway Administration	DM	16.51	Ground Water	Large water right, but not in high priority subbasin
Vanalco Inc/ALCOA	Heat exchange, group domestic	4.46	Ground Water	Large water right, but not in high priority subbasin; significant portion of water right is not likely for municipal use
City of Battle Ground	Municipal	3.51	Ground Water	Large municipal right, but granted a water right reservation in Watershed Plan
City of North Bonneville	Municipal	3.35	Ground Water	Large water right, but not in high priority subbasin
Meadow Glade Water Association	Multiple domestic	2.79	Ground Water	Large water right, but not in high priority subbasin
U.S. Army Corps of Engineers	Municipal	2.32	Ground Water	Large water right, but not in high priority subbasin
Washington Dept. of Fish and Wildlife	Fish propagation, domestic	2.14	Bob Creek (& other tributary)	Large water right, but not in high priority subbasin
R&R Joint Venture	Multiple domestic,	1.11	Ground Water	Within priority subbasin; but rate is smaller than

Table 5. Other Candidate Water Providers for Detailed Review of Inchoate Water Rights (Third Tier)				
Water Right Owner	Type of Use	Instantaneous Rate (cfs)	Source	Reason for Second Tier
WRIA 27				
	commercial/ industrial			other providers on the short list; significant portion of water right is not likely for municipal use

Finally, to confirm that the water rights database accounts for the Group A systems, the candidate list was compared to the Group A system list provided by DOH (see Attachment A-4). **Table 6** summarizes the number of Group A systems that have the corresponding minimum number of connections of 25, 100, 200 and 500 connections. Using 500 connections limits the number of systems to consider to nine (9) systems for the two WRIs combined.

Table 6. Number of Group A Systems with Range of Connections				
WRIA	25 Connections	100 Connections	200 Connections	500 Connections
27	19	9	7	5
28	25	11	6	4
Total	44	20	13	9

Table 7 summarizes the Group A systems having 500 or more connections for each WRIA. All of these systems were cross-referenced with the water rights database from Ecology, indicating that using the water rights database satisfactorily accounts for the larger Group A systems.

Table 7. Group A Systems with 500 or more Connections		
System Name	Number of Connections	Identified in Water Rights Database?
WRIA 27		
Camas Municipal Water System	6,752	Yes
City of Woodland	1,981	Yes
City of Kalama	1,515	Yes
Lake Merwin Campers Hideaway	1,067	Yes
Ridgefield Public Works	1,202	Yes
WRIA 28		
City of Vancouver	66,232	Yes
Clark Public Utilities	28,402	Yes
City of Washougal	4,445	Yes
Battleground Water Department	3,950	Yes

4.0 Next Steps

The Planning Unit and LCFRB needs to confirm and add to the short-list (First Tier) water providers/users proposed in this memo prior to conducting the detailed inchoate water rights review. If the Planning Units want to focus on other providers, some of the Second Tier water providers may be added or may replace those on the current First Tier list. Once the short-list is confirmed, water system plans will be requested where available to evaluate whether inchoate water rights exist for any of the providers. Interviews may also be conducted to obtain more current information.

It should be noted that the consulting contract is limited to approximately five water systems or providers for detailed review of additional information. The issue with addressing the cumulative impacts from smaller systems or providers is that the number of systems or users to review grows significantly. If this is the case, consideration would need to be given to whether additional resources can be identified to review additional systems' water rights.

Task 2-2: Review of Priority Inchoate Water Rights – WRIAs 27 and 28²

1.0 Introduction

An inchoate water right is defined as a portion of a water right that has not been fully put to use, or “perfected” under Washington State’s water code. Under RCW 90.82.048, watershed planning units throughout Washington State are required to assess municipal inchoate water rights under the Implementation Phase (Phase 4) of the watershed planning process. This effort is intended to identify any major risks and new challenges posed by development of inchoate water rights not already anticipated in the existing Watershed Management Plans. For WRIAs 27 and 28, the inchoate water rights review is comprised of three main parts:

- (iv) Identify potential municipal inchoate water rights posing the highest risk for stream flow;
- (v) Review a selected set of these rights to evaluate this risk further and prepare summary of pertinent information; and
- (vi) Provide recommendations to LCFRB and the Planning Unit on how these inchoate water rights should be addressed in the Detailed Implementation Plan.

A previous memo documented findings from item (i). This memo provides findings for items (ii) and (iii), namely: the assessment of the priority water rights selected by the Planning Unit for review; and the relationship between any inchoate portion of these water rights and the instream flow strategies developed in the Watershed Management Plan.

It should be noted that the original watershed planning process for WRIA 27/28 included many of the key water purveyors identified in the screening process. Discussions with these purveyors indicated that much of their existing water rights have already been developed, leaving relatively little in the “inchoate” category.

Water rights that have been put to use already are considered “perfected” under Washington State law, and therefore are not inchoate. One challenge for defining inchoate rights is that water rights include both annual quantities (typically expressed in acre-feet per year) and instantaneous quantities (typically expressed in cubic feet per second, or gallons per minute). In many cases a water right may have been fully put to use in terms of one of these metrics, but not the other. The information gathered for this review focused on average day production and maximum day production. Average day production offers a clear comparison with the annual quantity (Qa). Maximum day production offers only an imperfect comparison with instantaneous quantity (Qi). The purveyors contacted for this review indicated that many of their water sources at one time or another have in fact been used to produce the maximum instantaneous quantity permitted, leaving little if any inchoate right in the instantaneous category.

The Watershed Planning Unit has been developing a separate procedure for mitigation actions related to development of new water rights. It should be noted that there is no blanket

² HDR Memo #2, 2/11/08

requirement for mitigation in order for a water user to fully develop its inchoate water rights. **Therefore the inchoate water rights discussed in this memorandum are not subject to the mitigation procedures recommended in the watershed management plan.**

2.0 Priority Water Rights

The list of priority municipal³ water rights to review in detail was based on two screening processes. The first screening process, documented in HDR's Task 2-1 memo "*Screening Process for Review of Inchoate Water Rights*" dated August 7, 2007, developed three tiers of water rights for prioritization purposes. In the second screening process, LCFRB identified a list of water rights based specifically on habitat/streamflow priorities. For the most part, LCFRB's list identified many of the same water rights as priorities. The Planning Unit then reviewed the candidate list and added any other purveyors that the group wanted to specifically review and were not part of the candidate list from the two screening steps. The Planning Unit added City of Camas to the candidate list. The priority water rights (water purveyors) approved by the Planning Unit are listed in **Table 1**. Table 1 identifies which screening process identified the water purveyor as a candidate for the priority list. Only Tier 1 candidates from the first screening step are listed.

Although no small systems (with the exception of North Bonneville) were reviewed individually, they are typically not growing and therefore would not utilize inchoate rights. Small systems as a whole, are considered to pose low to no risk for streamflows in this context.

Table 1. Priority Water Purveyors and Water Rights Owners from Screening Process

Water Purveyor	HDR Screening (Tier 1)	LCFRB Review	Planning Unit	Planning Unit Decision for Detailed Review
Battle Ground		•		Conduct a detailed assessment of inchoate water rights
Camas			•	Conduct a detailed assessment of inchoate water rights
Clark Public Utilities		•		Conduct a detailed assessment of inchoate water rights
La Center	•	•		Include as part of CPU assessment (served by CPU)
Meadow Glade Water		•		Include as part of CPU assessment (served by CPU)
North Bonneville		•		Conduct a detailed assessment of inchoate water rights
Washougal	•	•		Conduct a detailed assessment of inchoate water rights
Weyerhaeuser		•		Eliminate from further review based on type of use
Yacolt	•	•		Include as part of CPU assessment (served by CPU)

The candidate water purveyors are reviewed in further detail in this memo with the exception of La Center, Yacolt, and Meadow Glade Water Association, which are served by Clark Public

³ For the purposes of the screening, "municipal water providers" included other non-municipal entities that provide water that can be used for municipal-type purposes as defined under RCW 90.03.015.

Utilities. These three candidates are reviewed as part of CPU's assessment. The Weyerhaeuser water right was removed from further assessment after confirming the water rights status. LCFRB had personal conversations with Ross Graham of Weyerhaeuser Company and Cameron Sharpe of the WDFW Kalama Research Station. The legal description for the water right is for the "Kalama Springs" facility in the upper Kalama watershed. Ross Graham indicated that there is currently no active water right use in the area, but historically the site was used for fish research. Cameron Sharpe confirmed the site was historically used by WDFW and Weyerhaeuser for various fish studies. The physical facilities were burned and vandalized years ago, and the site has since been fenced off and is dormant. Based on the information provided, it was concluded the historic use was non-consumptive, and since the facility is no longer in use, that the water right would not be evaluated further for the purposes of this review.

3.0 Watershed Plan Recommendations Related to Priority Water Rights

This section highlights the recommendations in the *Salmon-Washougal and Lewis Watershed Management Plan* for development of water supply and instream flow management. The priority water rights are assessed relative to these recommendations.

The Watershed Management Plan recognizes that the major municipal water providers will require new or expanded water supplies to meet growing demands within the next 20 years. The Plan includes a recommended procedure for requesting new or expanded municipal water rights, as well as other general recommendations for water supply development and specific recommendations for the major municipal water providers. These recommendations were developed in the context of meeting the objectives for instream flow management. Highlights of those recommendations are included in **Table 2**. Note, that recommendations for specific water purveyors are only shown for those included in the "priority list" shown in **Table 1**.

Table 2. Summary of Water Supply Development Recommendations from Watershed Management Plan	
Water Purveyor	Recommendation
All – General: Procedure for municipalities requesting new or expanded water rights	- Evaluate the relationship of proposed water supply projects to stream flows. - Analyze alternative options for water supplies that minimize impacts to stream flows (deep aquifer, purchase water from neighboring community or regional provider, develop tidally-influenced source) - Request access to "reservation" of water if no practicable alternatives are available. <i>(Note: this applies to new water rights applications only; does not apply to inchoate water rights)</i>
All – General: Existing municipal supplies with potential to impact flows in critical stream reaches	- Communities consider enhancing their conservation efforts. - Cease or limit use of existing supplies or develop alternative sources with less impact to flows. - Consider regional supplies/sources.
All – General: Sources of supply	Prioritize the use of the Columbia River, adjacent lowland reaches of tributaries subject to tidal effects, and/or associated groundwaters to meet water supply needs.
Clark Public Utilities and City of Vancouver	Work together to develop the Vancouver Lake groundwater source as a regional supply.
Clark Public Utilities	- Develop additional wells in the Pioneer area to serve as a public supply. - Develop Vancouver Lake wellfield; and use as a regional source of supply. - Continue efforts in Salmon Creek Basin management. <i>Note: More recently CPU has identified plans to develop Lewis River lowland wellfield for use as a north county regional supply.</i>

Table 2. Summary of Water Supply Development Recommendations from Watershed Management Plan	
Water Purveyor	Recommendation
City of Camas	- Review alternative source of supply to replace or limit use of surface water sources (Boulder and Jones Creek). - Evaluate non-potable supply from Columbia River for industrial purposes. <i>Note: More recently, Camas completed testing of this potential supply area and concluded that sufficient water is not available.</i> - Consider regional supply including purchase from Vancouver. <i>Note: Camas has not expressed interest in this recommendation by the Planning Unit. Rather, Camas has identified the lower Washougal River and the Steigerwald areas as their intermediate and long-term supply sources.</i>
City of Battle Ground	- Enhance water conservation efforts to reduce production from existing wells. - Review alternative source of supply to replace or limit use of wells that could impact East Fork Lewis River and Salmon Creek. - Purchase water from CPU.
City of Washougal	Consider use of regional supply option, including purchase from Vancouver. <i>Note: Washougal has not expressed interest in this recommendation by the Planning Unit. Washougal has identified plans to maximize use of existing water rights and then look to the Steigerwald area for its long-term supply needs.</i>
Small Systems (Group A and B)	- Evaluate purchase from a major water purveyor. - In cases where a reserved block of water is not available, acquire upstream water rights to off-set any impacts to stream flows.

4.0 Review of Water Rights Status

This review examines the water rights and planning data for the priority water purveyors to assess the impacts of inchoate water rights on instream flow management in the watershed. The review specifically considers the following questions:

- Are there any inchoate water rights based on comparing existing demands and source capacity with water rights?
- What are the water purveyor's plans to meet or address future water supply needs? Do the plans require use of their inchoate rights?
- How do the water purveyor's plans to address future water supply needs compare with the recommended actions or strategies in the Watershed Management Plan?

As mentioned above, part of the challenge with this review is the limitations of the data provided by the water purveyors (e.g. some plans reviewed were from 1999). While information in these plans were augmented with more recent direct input from the water purveyors during preparation of this memo, there is always the uncertainty associated with how plans change as new technical information or policy considerations are brought to the table. The assessment presented in this memo relies on the data available during this process.

The available water right is typically determined by comparing actual use (or capacity) against an annual volume limit (Qa in acre-feet) and instantaneous rate limit (Qi in cubic feet per second) defined in the water right. For the purposes of this assessment, the annual limit (Qa) is the primary quantity compared for the following reasons:

- (i) Historical records on instantaneous production is generally not available from the water providers.

- (ii) Water providers have indicated that they have maximized their use of their instantaneous water right (Qi) at some point during historical peak operations, implying that there is no instantaneous inchoate rights by definition.
- (iii) The MDD for most purveyors is about 2 times their ADD (Qa). Those purveyors who have exercised most of their Qa water rights will not be able to use additional Qi until more Qa has been issued. The proposed watershed plan reservations will limit future allocations of water rights for these purveyors in sensitive areas and thus is expected to limit the expanded use of Qi.

As part of this approach to evaluating inchoate water rights it is assumed that water use patterns will remain relatively the same in terms of the “maximum day” to “average day” production ratio.

Table 3 presents the planning data used to complete the review of water rights status and the development of potential inchoate portions. The following information is included in **Table 3** for the priority water purveyors:

- Water right summary (for primary rights only, not supplementary rights⁴)
- Initial and final years of the 20-year planning period.
- Population and equivalent residential units (ERU) served in the initial and final years.
- Average day demand (ADD) and maximum day demand (MDD) for the initial and final years.
- Surplus or deficit of annual withdrawals relative to the annual limit on water withdrawals (Qa) in the initial and final years.

The planning periods in the plans reviewed from the purveyors ranged from 1999-2020 to 2004-2024, so that actual inchoate rights for the present is not quantified exactly. However, it was beyond the scope of this review to extend the documented demand projections. Comparisons of the water rights to the “initial” and “final” year water demands quantifies the inchoate water rights from the respective planning periods and provides an indication of the range (i.e. sideboards) of the inchoate portion for each purveyor. The present inchoate rights would fall in-between the initial and final year values and gives a measure of the risk to streamflow.

⁴ Department of Ecology grants supplementary rights to allow a right holder to withdraw from a new location. Such rights do not increase the overall quantities which the right holder may withdraw.

Table 3. Summary of Water Rights Review for Priority Water Purveyors

	Battle Ground	Camas	Clark Public Utilities	North Bonneville	Washougal ⁽⁹⁾
Planning Period ⁽¹⁾					
Initial Year	2004	1999	1999	1998	2003
Final Year	2024	2020	2020	To build-out	2025
Water Rights ⁽²⁾					
Instantaneous Rate: Qi (gpm)	3,325	10,545	25,226	1,000	4,850
Annual Duty: Qa (ac-ft)	2,912	6,300	12,288	336	3,786
Production capacity (gpm) ⁽³⁾					
Initial Year	2,330	10,140	20,694	625	2,820
Final Year	Not specified	Not specified	Not specified	1,025	4,067
Service Area Population ⁽⁴⁾					
Initial Year	14,220	12,001	74,423	~1,250	9,775
Final Year	17,074	30,859	N/A (shown for county)	~2,500	18,653
Service Area ERUs ⁽⁵⁾					
Initial Year	6,073	9,887	31,910	325	5,943
Final Year	7,292	N/A	48,612	700	11,036
Average Day Demand (mgd) ⁽⁶⁾					
Initial Year	1.43	3.29	9.20	0.11	1.61
Final Year	1.71	7.11	14.19	0.25	3.09
Change in ADD	0.29	3.82	4.99	0.13	1.48
Maximum Day Demand (mgd) ⁽⁷⁾					
Initial Year	3.34	5.98	18.57	0.26	3.26
Final Year	4.01	12.87	28.20	0.56	5.79
Change in MDD	0.67	6.89	9.62	0.30	2.53
Surplus (Deficit) in Production Capacity (mgd)					
Initial Year	1.43	0.58	6.53	0.54	2.92
Final Year	Not specified	Not specified	Not specified	-0.04	1.13
Initial Year Surplus (Deficit) of Water Rights ⁽⁸⁾					
Annual: (Qa - ADD) (annual - ac-ft)	1,313	2,614	1,977	209	1,983
Percent Surplus Qa	45%	41%	16%	62%	52%
Final Year Surplus (Deficit) of Water Rights ⁽⁸⁾					
Annual: (Qa - ADD) (annual - ac-ft)	992	-1,665	-3,612	62	324
Percent Surplus Qa	34%	-26%	-29%	18%	9%

Notes:

(1) Planning Period - "Initial Year" refers to the beginning year for the planning period; "Final" refers to the final year of the planning period in the available water system plan.

(2) Qa total is only for primary water rights. Supplemental water rights are not included.

(3) Production (or firm) capacity as noted in the water system plan based on Year 1 conditions and projected supply development for Year 20. Production capacity can be compared with the instantaneous rate (Qi) of a water right.

(4) Population is shown for the service area of the water provider based on information in the water system plan

(5) ERU - Equivalent Residential Unit. ERU service unit is defined as the amount of water consumed by a typical full-time single-family residence. This system of capacity analysis allows all customers to be compared on the basis of an average single-family residence within the service area of the water provider. Total includes ERUs for unaccounted-for-water.

(6) Average Day Demand - ADD is taken directly from the water system plans from these communities, and are typically calculated from demand per ERU based on historical water use data.

(7) Maximum Day Demand - MDD is taken directly from the water system plans from these communities, and are typically calculated based on a "peaking factor" times ADD.

(8) "Initial Year" and "Final Year" Surplus - calculated for instantaneous rate relative to MDD; calculated for annual duty relative to ADD.

(9) The annual water right (Qa) assumed is that defined in the issued water right certificate in 1981. Washougal is in discussions with Ecology to resolve the annual quantity issue.

If this restriction is not applied, the Qa is 6,504 ac-ft. per the totals for the individual claims.

Table 4 presents information to evaluate the potential impacts to stream flow resulting from the inchoate water rights presented in **Table 3**. The impacts to stream flow from well production is dependent on numerous factors related to how hydraulically connected the aquifer source is to surface water. These primary factors include the pumping rate, distance of the point of withdrawal from the stream, and the characteristics of the aquifer media. It is beyond the scope of this project to quantify the magnitude of the hydraulic connectivity for the individual wells and wellfields. However, based on work done in the watershed on surface-groundwater interaction including work documented in the Watershed Management Plan, there is generally an impact to streamflow from groundwater pumping. That is, the increase in groundwater production from any well will generally result in some quantity of reduced flow in the regulated stream. This effect may occur quickly or with a lag time of weeks or months. Potential streamflow impacts can be dampened through seasonal variation in capture (e.g., capture during the high flow season), or through capture of groundwater that is wholly or partially in continuity with tidally-influenced reaches.

The potential relative impact or risk is quantified by calculating the additional maximum production that each purveyor could employ under their inchoate water rights (based on the Qa – ADD values in **Table 3**). The inchoate rights under the “initial” time period is presented, in order to be more conservative in the risk discussion. The inchoate right (in terms of Qa) is converted to an average daily production value and then multiplied by the documented peaking factor to calculate the additional maximum day production that could be used under the inchoate portion of the water right. This approach assumes that peaking factors documented by these systems will not change dramatically in future years. As **Table 4** shows, the range of additional maximum-day production available from the inchoate portion ranges from 0.7 cfs in North Bonneville to 6.6 cfs in Camas. These values are based on the initial years, which range from 1999 to 2004. Growth since then has likely used up some of these quantities.

	Battle Ground	Camas	Clark Public Utilities	North Bonneville	Washougal
Inchoate Water Rights (Qa) (ac-ft)	1,313	2,614	1,977	209	1,983
Additional Average Day Production (mgd)	1.2	2.3	1.8	0.2	1.8
Peaking Factor (based on MDD/ADD)	2.3	1.8	2.0	2.3	2.0
Additional Max. Day Production (per Qa limit) (mgd)	2.7	4.2	3.6	0.4	3.6
Additional Max. Day Production (per Qa limit) (cfs)	4.2	6.6	5.5	0.7	5.5

The following subsections presents the findings and conclusions for each of the priority water purveyors.

4.1 City of Battle Ground

Information for this review was derived from the *City of Battle Groundwater System Plan* dated December 2004. The planning period for the plan was through 2024. Battle Ground provides water services in Clark County, Washington to residents of the city and a few residents adjacent to the city limits. The population projection assumed Battle Ground would expand to the new urban growth area. Some of the new urban growth area is currently served by CPU, and they would continue to serve those areas after annexation by Battle Ground.

Battle Ground’s existing water system uses groundwater from eight wells. The total water rights for these wells allow for an instantaneous rate of 3,325 gpm and annual limit of 2,912 ac-ft

(primary)⁵. The wells have a capacity of 2,330 gpm, but production has been dropping in recent years. Battle Ground also has interties with CPU. These interties can provide as much as 500 gpm. The last few years Battle Ground has utilized the CPU intertie to meet some of its peaking demands in the summer.

More recently, Battle Ground signed a memorandum of understanding (MOU) with CPU to transfer 1,000 acre-feet/year of their water rights to CPU. This transfer was made to provide CPU adequate water rights to serve Battle Ground who has some limitations for summer peaking capacity.

Findings from Water Rights Review:

- Battle Ground's projected MDD will increase by 0.67 mgd (1.04 cfs) by the end of the 2024 planning period.
- In general, water rights (instantaneous rate and annual quantity) are sufficient to meet projected demands through the planning period.
 - o Instantaneous water rights are sufficient to meet MDD; however, the surplus is relatively small at 0.78 mgd in 2024.
 - o Annual water rights are sufficient to meet ADD; as of 2004 master plan, a surplus of almost 1,000 ac-ft/year assuming all of its water rights can be utilized. *Note: this may not be available due to the recent MOU transferring 1,000 ac-ft/yr to CPU.*
- Battle Ground will need to develop additional *source capacity* to meet instantaneous demands in the near-term. Existing wells do not pump at levels sufficient to utilize all of the water rights. *Battle Ground is currently relying on water from the CPU intertie to meet peak demands.*
- Additional water rights will be needed if future wells cannot use existing rights (if requested transfer is denied); if Battle Ground is able to drill additional wells and transfer their water rights they would have enough water over the planning period.

Approach for Securing Future Water Supply:

- As of the 2004 plan, Battle Ground submitted two change applications to transfer unused capacity at existing wells to new wells. Since then, test wells have determined yield and water quality limitations at these new well sites.
- The most likely approach is for Battle Ground to develop an agreement with Clark Public Utilities for long-term supply through CPU's regional Vancouver Lake and Lewis River lowland options.
- Future water conservation programs may produce slight decreases in average usage but a large decrease in usage is not expected. Enhanced conservation measures may be necessary if Battle Ground has trouble finding a long term supply of water in the near future.
- Battle Ground considers pursuing surface water as too costly and obtaining new water rights as too uncertain to consider at this time.

Implications for Instream Flow Strategy:

Battle Ground's water rights are sufficient to meet their projected water demands based on their 2004 master plan, but their source deficiency occurs in the available production capacity from their wells. Battle Ground recognizes water conservation as a necessary component of their water supply strategy, but they are not expecting this to eliminate the need for increased source

⁵ Input from Battle Ground on the draft of this memo indicates that their Qa would be about 2119 af/yr after accounting for the 1,000 ac/yr of transfer to CPU.

of supply. However, Battle Ground will not likely pursue developing their existing water rights with new wells, because they recently determined that their planned wells have yield and water quality problems. Since CPU is currently providing them with some supply now and their plan appears to be to pursue an agreement with CPU for their longer-term needs, it is not likely that Battle Ground will develop much if any of their limited inchoate water rights.

Battle Ground has some inchoate water rights, and therefore poses *potential* risk to streamflow management. Table 4 estimates that additional production using their inchoate rights ranges could be 4.2 cfs (based on the initial year of 2004). Groundwater attenuation effects would likely reduce potential impacts to stream flow.

Battle Ground is considered to pose a **“low risk”** to streamflow with respect to their inchoate water rights, for the following key considerations discussed above:

- While Battle Ground has approximately 4.2 cfs of inchoate water rights, they are not likely to develop much if any of these rights. Battle Ground supply sources are currently limited by the yield and water quality factors. Currently the City is using CPU to meet a portion of their peaking needs.
- Battle Ground will meet most of their future needs through a supply agreement with CPU that would allow them to tap into the Vancouver Lake and Lewis River lowland sources.

In any case, Battle Ground should continue to be encouraged to seek supply alternatives that limit impacts to streamflows while the regional supplies are developed.

4.2 City of Camas

Information for this review was derived from the *City of Camas 2001 Comprehensive Water System Plan*. The planning period was through 2020. The Camas water service area is significantly larger than its UGA. Over 50 percent of the water service area is located outside of the UGA, including customers in Clark County to the northeast of the City, and customers within the City of Vancouver's UGA. Should Camas expand its UGA, population growth and the number of customers served by Camas in this area could change significantly. Camas provides water to the City of Washougal under low pressure conditions through three interties. There are currently no interties or written agreements with CPU; however CPU has two satellite systems⁶ located within the City of Camas Water Service Area Boundary.

Camas currently obtains its source water from Boulder and Jones Creeks and nine groundwater wells. The total instantaneous water right for all sources is 10,545 gpm, and the total annual water right is 6,300 ac-ft. Camas' water rights claims are included in these totals. The surface water sources are allowed an instantaneous diversion of 1,570 gpm and annual surface water diversion of 2,550 ac-ft. The instantaneous groundwater withdrawal for the certificated/permitted wells is 7,175 gpm, while the annual groundwater right is 3,200 acre-feet. Camas holds claims on two wells (No. 1 and 2) that have a combined annual withdraw limit of 550 ac-ft, and an instantaneous limit of 1,800 gpm. The capacity of the system is 10,140 gpm. The majority of the surplus of water rights over pumping capacity is due to an inability to

⁶ CPU is a designated Satellite Management Agency in Clark County. Two of its service areas lie within the Camas Water service area boundary for Camas. CPU is responsible for providing water to these areas.

completely utilize the Jones and Boulder Creek instantaneous water right capacity. In the summer months, supply is limited at this source due to low creek flows.

Findings from the Water Rights Review:

- Camas' projected MDD will increase by 6.89 mgd (10.7 cfs) from 1999 to 2020.
- Source capacity and instantaneous water rights are sufficient to meet MDD for the water system in the near-term.
- In the near-term, additional water rights are needed to meet annual volume limits. By 2020, annual limits for existing water rights, including credit for pending water right claims, will not be sufficient to meet any of the growth scenarios evaluated in their plan.

Approach for Securing Future Water Supply:

- Maximize existing water rights from existing sources; pursue an increase in the annual water rights at its existing sources.
- Implement conservation in accordance with State requirements to reduce consumption and lost water.
- Acquire new water rights, either through the purchase and transfer of existing water rights, or through a new application through the traditional water right application process.
- In the 2001 plan, Camas originally considered four long-term options for its surface water sources. This has more recently been updated to include the following three options (per comments received from Dan Matlock, PGG, on the draft version of this memo):
 - o Continued use of the water rights under historical use practices (this would only occur if the City could not negotiate new water rights at the lower Washougal River wellfield site).
 - o Eliminate use of their Jones and Boulder Creek surface water sources during the low flow period (May 15 – October 31) if Ecology would authorize new water right permits for groundwater supplies in the lower Washougal wellfield area (source substitution).
 - o Expand use of surface water sources during high flow period (November 1 – May 14) if engineering studies support infrastructure improvements necessary to divert additional water available under existing rights.
- More recently, Camas installed test wells in the Steigerwald area and confirmed that there is adequate water to meet long-term demands. Considerable time and expense will be required to develop this source and the infrastructure necessary to tie it into the City's existing system. Therefore this is best viewed as a longer-term option and/or a regional partnership opportunity.

Implications for Stream Flow Strategy

As noted above, Camas was projected to need additional water rights in the very near-term (2006-2008 period) based on annual volume limits in their water rights. The deficiency in Qa does limit the ability of Camas to develop their production capacity and maximize use of their instantaneous rights.

Camas has some inchoate water rights. Table 4 shows that additional production using their inchoate rights could reach 6.6 cfs over and above the initial year production (1999). Much of this has already been absorbed by growth since 1999, and the remaining inchoate portion would likely be fully put to use by the 2010 time frame. Ground water attenuation effects would likely reduce potential impacts to stream flow.

Camas is considered to pose a “**low risk**” to streamflow with respect to their inchoate water rights, for the following key considerations discussed above:

- Camas is limited by their annual water rights limits from increasing production significantly.
- Analyses indicate that Camas' plans to forgo or reduce use of their surface sources could limit the actual impact to streamflows and improve low flow conditions in Jones and Boulder Creeks, the Little Washougal River, and the mainstem Washougal River, even with the increased use of their groundwater.

4.3 Clark Public Utilities

Information for this water rights review was derived from the *Clark Public Utilities Water System Plan* dated September 2003. The planning period was through 2020. CPU's water system serves the unincorporated, urban and rural areas of Clark County north and northeast of the City of Vancouver incorporated area. CPU is Clark County's designated agency for satellite system management and operates over 20 satellite water systems (as of 2001). Its service area also includes the Hazel Dell, Hockinson and Meadow Glade communities, as well as areas along the Lewis River. The service area includes the City of La Center, the community of Amboy (as a satellite system), and the Town of Yacolt (as a satellite system), but excludes the cities of Battle Ground, Ridgefield, Vancouver, Camas and Washougal. The water utility's customers are presently concentrated within the Hazel Dell service zone, most of which is within the City of Vancouver UGA. Future development is projected to occur primarily in the Hazel Dell area. The La Center service zone has experienced rapid growth during the 1990s but remains a relatively small portion of the total customers served.

Attachment A includes a list of the satellite systems and a summary of the inchoate water rights review for those Group A systems with their own water rights and/or water source. The review under this task did not consider the Group B systems individually, because most of those systems have smaller demands and production rates, and their relative risk is assumed not to be significant compared to CPU's inchoate water rights as whole.

The water utility has four emergency interties in operation. Three provide water to the City of Battle Ground. The fourth intertie is with the City of Vancouver's system. There are 32 wells supplying groundwater to the system. Most of the larger supply wells are in the Hazel Dell, Pioneer, and Meadow Glade areas. Other wells are scattered throughout the system. CPU holds forty-four certificates and permits on the water sources in its water supply system. The water rights include an annual total of 12,288 ac-ft of primary right and 12,878 acre-feet of supplemental right⁷. The instantaneous withdrawal rate for all of the rights combined is 25,226 gpm (36.3 MGD). Not all of the instantaneous water rights are being used at this time, although a large portion of their annual water rights are being exercised. Maximum production capacity at CPU's wells is 20,694 gpm.

Findings from the Water Rights Review:

- CPU's projected MDD will increase by 9.62 mgd (14.9 cfs) by the end of the 2020 planning period.
- The limiting factor for CPU is their annual volume limits to their water rights. ADD exceeds the primary water rights (annual quantity limits) in the near-term (by 2008 assuming all existing water rights are put to use).

⁷ Based on input from CPU for the draft version of this memo, CPU has a total Qa of 13,846 af/yr. This includes 1,000 af/yr that was transferred from Battle Ground to CPU so that CPU could serve Battle Ground more effectively during the summer peaking season.

- CPU needs to secure new water rights in the very near future in addition to new water sources.
- Of the satellite Group A systems reviewed (see **Attachment A**), the total inchoate water rights (based on 2003 water use) is 2.42 cfs. Individually, the inchoate water rights for the systems ranged from 0.27 cfs to 0.63 cfs. With the exception of Yacolt, these Group A systems do not expect to seek additional water rights.
- The critical supply period corresponds to the maximum demand season when groundwater levels are typically at their lowest. Long-term concerns about declining levels require management of the deep aquifer (SGA) to maintain the viability of this source.
- A comprehensive characterization of the groundwater/surface water system has been performed annually as part of Salmon Creek Water Resources Management Plan.

Approach for Securing Future Water Supply:

- CPU expects to meet a large portion of their future water demand from large wellfields near the Vancouver Lake and Lewis River lowlands, as well as some wells in Sand and Gravel Aquifer in the Pioneer Area, Meadow Glade and Sara areas.
- CPU has evaluated surface water supply options and has concluded that they would be too costly to develop and that water right permits would be difficult to obtain under the current regulatory framework.
- Based on the level of conservation already being implemented, future water conservation programs may produce slight decreases in average usage but a large decrease in usage is not expected.

Implications for Stream Flow Strategy:

As noted above, CPU was projected to need additional water rights in the very near-term (2008 period) based on annual volume limits in their water rights. CPU is limited in terms of annual volume limits, which also limits their ability to develop their production capacity to maximize use of their instantaneous rights. Finally, the satellite systems can legally develop an additional 2.4 cfs (total) of their instantaneous water rights.

CPU's production wells are located in several subbasins, including the East Fork Lewis River, Salmon Creek, and Lacamas Creek. CPU has some inchoate water rights (based on 2000 initial year). **Table 4** shows that additional production using their inchoate rights could be 5.5 cfs. These flows would be distributed among the different subbasins, and the net impacts would likely be smaller for each subbasin. Groundwater attenuation effects would likely reduce potential impacts to stream flow. The inchoate portion would likely be eliminated by 2010.

CPU is considered to pose a **“low risk”** to streamflow with respect to their inchoate water rights, for the following key considerations discussed above:

- CPU is limited by their annual water rights limits from increasing production significantly.

4.4 North Bonneville

Information for this review was derived from the 1998 *City of North Bonneville Water System Plan* and discussions with City staff. A more recent plan was not available. North Bonneville considers its population projection to be out-dated, but based on the ERU data available approximately 1,250 people reside within the service area. North Bonneville is in the Columbia River Gorge National Scenic Area, and cannot annex any more land. Thus, build-out population is estimated to be 2,500 (or 700 ERUs).

North Bonneville's source consists of a single well with a capacity of 625 gpm. The City's water right is for an annual total of 336 ac-ft and instantaneous rate of 1,000 gpm.

Findings from the Water Rights Review:

- North Bonneville's projected production (maximum day demand) will increase by 0.30 mgd (0.46 cfs) through build-out.
- As of 1998, North Bonneville could still develop up to 0.4 mgd (0.7 cfs) of its remaining water rights beyond their initial (1998) MDD.
- North Bonneville has adequate water rights through build-out.

Approach for Securing Future Water Supply:

- North Bonneville would construct another supply well if needed, within their existing water rights. A second well is necessary to increase system capacity and reliability. North Bonneville has not established the timeframe for developing a future supply well.

Implications for Stream Flow Strategy:

North Bonneville is operating within their water rights and do not have plans to expand their source of supply. North Bonneville is considered to pose a **"low risk"** to streamflow with respect to their inchoate water rights, for the following key considerations discussed above:

- The inchoate portion of North Bonneville's water rights is likely to be relatively small.
- North Bonneville is not likely to develop much if any of their limited inchoate water rights.

Although the inchoate portion of North Bonneville's water right is relatively small and use of it is unlikely, potential adverse impacts to instream flows are possible. The Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan identifies low summer flows within Hamilton Creek as a primary habitat limiting factor. Extensive reaches of Hamilton Creek, including those that flow through North Bonneville, are known to go subsurface during the low summer flow period. The existing City well is located near Moffet Creek, which is a tributary to Greenleaf Lake and Hamilton Creek. The degree to which the existing City well is in continuity with these surface waters, however, is unknown. If North Bonneville decides to seek a new supply to increase its source reliability, they should be encouraged to develop a system that is not in hydraulic continuity with Hamilton Creek or tributary watercourses, consistent with the Watershed Management Plan recommendations for development of new supplies. Potential sources to investigate should include the Pleistocene Alluvial Aquifer near the Columbia River.

4.5 City of Washougal

Information for this review was derived from the *City of Washougal Comprehensive Water System Plan Update* dated February 2003. The planning period was through 2025. The City of Washougal is the water purveyor for the area within the Washougal UGA and its designated urban reserve. Washougal does not project a need to extend the water system into the more rural portions of the water service area during the planning period.

Washougal relies on two wellfields comprised of five wells, which have a maximum firm capacity of 2,820 gpm when simultaneously operated. All of the City's wells produce water from the shallow Pleistocene Alluvial Aquifer. The City's water rights include two certificated rights with an annual total of 1,742 ac-ft and instantaneous rate of 1,500 gpm. The other water rights are claims with an annual total of 7,827 ac-ft and instantaneous rate of 4,850 gpm. However,

there is a limiting condition associated with certificate G2-25796 that states, “The total annual water allocation for the City of Washougal shall be limited to 3,786 acre-feet per year for municipal use from *all rights* [emphasis added].” Washougal has an interlocal agreement with neighboring City of Camas for the delivery of emergency water supply through two interties. The higher pressure of the Camas water system allows for gravity flow into the Washougal water system if required.

Findings from the Water Rights Review:

- Washougal’s projected MDD will increase by 2.53 mgd (3.9 cfs) by the end of the 2025 planning period.
- Uncertainties regarding Washougal’s water claims are currently being resolved.
 - o There is uncertainty regarding what the permitted instantaneous flow rate (Qi) and annual volume is for Well Nos. 6 and 7 as specified in combined certificate G2-25796 issued in 1981. The certificate indicates that the permitted Qi is approximately half of what was intended. Discussions with DOE staff indicate that the certificate can be changed if there is a factual basis for doing so. The City is currently investigating the factual record in order to clarify the intent of the certificate.
 - o Washougal has a number of claims that have never been converted to certificates.
 - o Washougal is investigating changing the water rights associated with Wells Nos. 3 and 9, and intends to work with DOE to propose a resolution.
- Resolution of current permitted water rights must be made for Washougal to know how much additional water it needs to satisfy future demands.
 - o Based on projected demands the City will need some additional water rights in the near future, if the certificate limits are enforced.
 - o Washougal has adequate water rights in the form of total certificates and claims to meet demands within the planning period, if the claims are upheld and if the claims are considered to be primary water rights.
- Based on a groundwater supply expansion study in October 2003, the Alluvial Aquifer will be able to serve as the Washougal’s sole source for the foreseeable future.

Approach for Securing Future Water Supply:

- Washougal is evaluating options to transfer water rights or repair wells that are not currently in use, and intends to use all of its water rights to meet future needs.
- Washougal intends to continue to work with Ecology to confirm the status of the claims. The City believes it is able to continue use of these rights under the claim declarations.
- Washougal has filed a new water right application for 1,000 gpm (and 645 ac-ft annually) as current water right issues are resolved. Following procurement of this water right, Washougal intends to resolve current water rights issues with Ecology and file additional water right applications as needed.
- Washougal intends to develop additional wells in the Pleistocene Alluvial Aquifer using its existing claims. The Water System Plan noted a firm capacity of 4,067 gpm by 2025, which is an additional 1,247 gpm from current capacity.
- Washougal has been working with City of Camas on exploring the development of groundwater wells in the Steigerwald area. As discussed with Camas, test wells in the Steigerwald area have confirmed that there is adequate water to meet long-term demands although it may take considerable time and money to develop this source and to integrate it into the City’s existing system.

Implications for Stream Flow Strategy:

The status of the water rights claims needs be resolved to completely assess the status of the inchoate portions. However, Washougal potentially has a significant quantity of inchoate water

rights that could impact stream flows in the Washougal River subbasin. As of 2003, over 50% of their water rights (annual basis) had not been developed. Washougal is planning additional supply capacity on the order of 1,200 gpm (2.67 cfs) within the 2025 planning period. This increase in production (demand) could have some impact to the Washougal River, especially since the wells are in the shallow aquifer.

Washougal has some inchoate water rights, and therefore poses *potential* risk to streamflow management. **Table 4** shows that additional production using their inchoate rights could reach 5.5 cfs. Groundwater attenuation effects would likely reduce potential impacts to stream flow.

Part of Washougal's plan is to more fully develop their existing groundwater well sources, while the regional option from the Steigerwald area is being developed. Washougal's primary near-term source will continue to be the Pleistocene Alluvial Aquifer, and despite being considered highly productive, further developing groundwater wells could impact stream flows because it is a shallow aquifer. Depending on how long the regional sources take to develop, it is possible that Washougal would further develop their inchoate water rights while the regional supplies are developed. There could be stream flow impacts from the increased well use. The stream flow impacts would depend on the actual capture rate and the increase in production.

Washougal's future source development is considered to pose a **"moderate to low risk"** to stream flow with respect to their inchoate water rights, for the following key considerations discussed above:

- Washougal has approximately 5.5 cfs of inchoate water rights that could potentially be developed.
- Potential impacts from development of these inchoate water rights could be small to moderate.

Washougal's supply development approach is generally consistent with the Watershed Management Plan strategy.

5.0 Summary of Findings and Recommendations

When reservations were established for streams within WRIAs 27/28, it was known that various communities held inchoate water rights which they are entitled to fully develop. This memorandum provides more detailed information on the locations and magnitudes of those existing, inchoate water rights for consideration by the Planning Unit.

The inchoate water rights review for WRIAs 27/28 included four major water providers and one small system in North Bonneville. All four of the major water purveyors were evaluated in the *Watershed Management Plan*. During that process the Planning Unit did a comprehensive assessment of the existing plans to address water supply needs in relation to permit capacity. The municipal needs and the general water supply development strategies documented in the *Watershed Management Plan* are generally consistent with those documented in the water system plans reviewed. Although no small systems (with the exception of North Bonneville) were reviewed individually, they are typically not growing and therefore would not utilize much of the available inchoate rights. Small systems as a whole are considered to pose low to no risk for streamflows in this context.

All the major water purveyors reviewed in this memo have some inchoate water rights. Based on a review of their approach to securing future water supply, the risk to stream flows resulting

from the presence of these inchoate water rights are expected to be low to moderate, in a relative sense, as summarized below:

- Of the major purveyors reviewed, Battle Ground is considered to pose the lowest risk because their inchoate rights are relatively small and they are not expected to develop them because they are already relying on CPU to meet their short-term needs.
- CPU and Camas are considered to pose low risk despite their inchoate rights, because their annual quantity limits prevent them from increasing their production capacity and maximizing their instantaneous rights.
- Washougal is considered to pose moderate to low risk. Washougal's inchoate rights are actually smaller than CPU and Camas; however, Washougal does not appear to be as constrained in terms of developing those inchoate rights.
- North Bonneville was the only small system in the priority list and is considered to pose a low risk to stream flow due to their inchoate rights, because their demand is not expected to increase significantly.
- Generally, many of the water systems contacted for this review indicated that their sources have been exercised to the full limit of their instantaneous rights, at various times. This suggests that impacts to stream flows were already accounted for at the time the Watershed Management Plan was developed and reservations for new water allocations were defined.

The major water purveyors are working together to explore the development of regional groundwater supply options in the Vancouver Lake, Lewis River, and Steigerwald lowland areas. Their source development approach is consistent with the procedure outlined in the Watershed Management Plan. Furthermore, other constraints may prevent the utility from further developing the inchoate portion (e.g., water quality requirements and actual water availability from the source).

Based on the review of inchoate water rights and current plans by the purveyors, the following recommendations should be considered for inclusion in the Detailed Implementation Plan to address the potential risks to stream flows:

- The water purveyors needing new or expanded sources should be encouraged to use the supply development procedure outlined in the Watershed Management Plan (Section 3.3.1) to limit impacts to streamflows.
- Consistent with policies developed in the Watershed Management Plan, water purveyors should continue to actively pursue development of regional groundwater supplies in Clark County, namely near Vancouver Lake, Lewis River lowlands, and the Steigerwald area. Ecology should facilitate development of these water sources and issue any needed water right permits. Supporting the earlier development of the regional supplies will help limit the need for the purveyors to rely on developing their inchoate water rights.

Attachment A

Clark Public Utilities Satellite Water Systems

Table A-1 lists the satellite water systems owned and operated by Clark Public Utilities. CPU prepared water system plans for its Group A systems as part of its 2003 Water System Master Plan. The review under this task did not consider the Group B systems, because most of those systems have smaller demands and production rates, and their relative risk is assumed not to be significant compared to CPU's inchoate water rights as whole. A brief summary of the water rights and water use information for the Group A systems with their own water rights and/or sources is included in **Table A-2**.

Attachment A Table-1 Satellite Water Systems Owned & Operated by Clark Public Utilities			
Water System	Address	ID Number	Type
Amboy	26131 NE 419 ST	046254	A
Cascade Estates	1406 SE 195 AV	005078	A
Frenchmans Bar Park	Lower River Road	AA289A	A
Haapa Park	43501 NE Haapa Rd.	AA215K	A
Lds Church^	18214 NE 18 ST	020278	A
Morning Meadows	1610 NE 194 AV	00950E	A
Regency Place	NE 192 AV & NE 6 ST	AA308K	A
Tukes Mtn Water System^	22201 NE 150 TH AVE, Battle Ground	283400	A
Yacolt	Town of Yacolt	99000V	A
Allen Canyon Acres	31000 NW 51 AVE	639898	B
Daniels	NE 276 AV & Bradford RD	AA2339	B
Dobler Hill	40500 NE Dobler Hill RD	05655Y	B
King Corner	NE 252 ST & NE 68 AV	AA300M	B
Lewisville Heights	23505 NE 120 CT	02126V	B
Mc Kee Road	23519 NE 388 CIR	04478P	B
Mountain Glen	NE 199 AV & NE 48 ST	AA234G	B
Pekin Ferry	5101 NW Pekin Ferry RD	08492C	B
Proebstel	NE 188 AV North Of NE 73 ST	00736R	B
Sun Acres	NE 290 ST & NE 10 AV	00492V	B
Sunny Meadows	36200 NE 247 AV	02764M	B
Sweet Briar Estates	SE 282 Ave OFF SE 30 Circle	069223	B
Vernon Road (Esteb)	NE 369 CT. and Vernon RD.	011594	B
View Acres	NE 85 AV & NE 379 ST	00062K	B
View Ridge	NE 114 CT & NE 410 ST	02125B	B
Zumstein	NE 21 AV & NE 406 ST		B*
^ Water systems are privately owned. CPU runs operation of LDS Church, only provides certified operator for Tukes Mountain.			
*Water Systems do not have ID assigned at this time.			

Attachment A Table -2. Summary of Water Rights and Water Use Data for CPU's Satellite Group A Water Systems				
System	Water Rights	Source Capacity	Water Demand	Notes
Amboy	Qi = 300 gpm Qa = 80 ac-ft	Groundwater wells = 300 gpm	2003 = 40 gpm MDD 2022 = 69 gpm MDD	- Adequate water rights and source capacity through planning period - Inchoate rights = 260 gpm (0.58 cfs)
Cascade Estates	Qi = 140 gpm Qa = 8.6 ac-ft	Groundwater wells = 140 gpm	2003 = 21 gpm No future growth projected	- Adequate water rights and source capacity through planning period - Inchoate rights = 119 gpm (0.27 cfs)
Frencman's Bar	Qi = 120 gpm; 270 gpm permit application	Groundwater wells = 135 gpm	2003 = 4.9 gpm Build-out = 7.7 gpm	- Adequate water rights and source capacity through planning period; transient use only as park - Inchoate rights = 265 gpm (0.59 cfs)
Haapa Park	Exempt	Groundwater wells = 25 gpm	Build-out = 0.69 gpm	- Adequate water rights and source capacity through planning period; transient use only as park - Inchoate rights = N/A
LDS Church	Exempt	Groundwater wells = 100 gpm	2003 = 1.0 gpm No future growth projected	- Adequate water rights and source capacity through planning period; church use only - Inchoate rights = N/A
Morning Meadows	Qi = 180 gpm Qa = 12.6 ac-ft	Groundwater wells = 180 gpm	2003 = 20.8 gpm No future growth projected	- Adequate water rights and source capacity through planning period - Inchoate rights = 159 gpm (0.35 cfs)
Yacolt	Qi = 460 gpm Qa = 311 ac-ft	Groundwater wells = 380 gpm	2003 = 179 gpm 2022 = 413 gpm	- Annual water rights will be exceeded ~2018; seeking additional water rights through transfers - Inchoate rights (2003) = 281 gpm (0.63 cfs)

Qi – instantaneous rate

Qa – annual volume total (duty)

gpm – gallons per minute

cfs – cubic feet per second

MDD – maximum day demand

Attachment A-1.
Screening Results for WRIA 27
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority; Not Likely Municipal-type use	Grantee Water Right Reservation	First Tier	Second Tier	Third Tier
Surface Water																		
	ANDERSON ARVID L	Cert	7/13/1977	ST,DM	0.03	06.0N 03.0E 13	SW/SE	1	UNNAMED SPRING			x						
10528	BERRY H M	Cert	6/26/1967	WL,DS	0.04	06.0N 01.0W 35	SE/SW	2	UNNAMED SPRING			x						
	CARGILL H S & D H	Cert	8/3/1971	FR,DM	0.02	07.0N 04.0E 26	SW/NE	1	UNNAMED SPRING			x						
10773	CATHEY M S	Cert	10/8/1968	DM	0.02	05.0N 01.0E 28	SW/NE	1	UNNAMED SPRING			x						
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.022	05.0N 03.0E 19	SE/SW	1	SWALE CREEK			x						
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.02	04.0N 01.0W 12	NE/SE	1	UNNAMED SPRING			x						
	Clark Cnty Department Of Public Works (total SW)				0.042	05.0N 03.0E 19			SWALE CREEK + other trib			x						
	COPENHEFER/GOETZ	Cert	12/13/1973	ST,DM	0.02	05.0N 02.0E 07		1	UNNAMED SPRING			x						
	Cougar Enterprises	Cert	12/20/1988	DM	0.02	07.0N 04.0E 26	NE/NE	1	UNNAMED SPRING			x						
	DAVIS DUANE D	Cert	8/29/1973	DM	0.02	07.0N 01.0W 35	SW/SE	1	UNNAMED SPRING			x						
	DAVIS DUANE D (total SW)				0.042	07.0N 01.0W 35			KALAMA RIVER + other trib			x						
	DAVIS DUANE ET UX	Cert	6/28/1974	DM	0.022	07.0N 01.0W 35	SW/SE	1	KALAMA RIVER			x						
	DOEBELE RICHARD	Cert	6/11/1974	IR,DM	0.02	06.0N 01.0E 09	SE/SW	1	UNNAMED STREAM			x						
06692	DOTY E	Cert	2/20/1956	ST,DM	0.03	05.0N 01.0E 29		1	UNNAMED SPRING			x						
	ENGLISH MARJORIE	Cert	4/23/1974	DM	0.02	04.0N 04.0E 22	NE/SW	1	EAST FORK LEWIS R			x						
07162	FALK I R	Cert	1/23/1956	ST,DM	0.11	05.0N 01.0E 25	NE/NW	1	UNNAMED STREAM								x	
	FISHER/DONALDSON	Cert	2/11/1974	DM	0.02	04.0N 03.0E 09	SE/SE	1	EAST FORK LEWIS R			x						
	FRASIER/VENS ET AL	Cert	9/15/1977	ST,DM	0.05	05.0N 04.0E 06	NE/SW	1	UNNAMED SPRING			x						
05921	FROST J B ET UX	Cert	8/22/1952	DM	0.02	07.0N 01.0W 35	W2/SE	1	UNNAMED SPRING			x						
	GILLET LLOYD ET UX	Cert	6/21/1974	DM	0.02	05.0N 02.0E 31	SE/NW	1	REID CR *			x						
10794	GODFREY P L / N M	Cert	8/21/1964	DM	0.016	05.0N 01.0W 12		1	BURRIS CREEK			x						
	GUENTNER H J ET UX	Cert	8/31/1977	IR,DM	0.1	05.0N 03.0E 33	NE/NW	1	UNNAMED SPRING			x						
10733	HABERSETZER R	Cert	10/2/1968	DM	0.02	04.0N 02.0E 27	NW/SW	1	UNNAMED SPRING			x						
03619	HAM F	Cert	10/20/1947	DM	0.01	06.0N 03.0E 25	SW/NW	1	UNNAMED SPRING			x						
	HARRIS WAYNE A	Cert	5/15/1986	DM	0.033	05.0N 03.0E 25	SW/SW	1	UNNAMED SPRING			x						
	HENDERSON JAMES C	Cert	5/31/1968	DM	0.09	06.0N 03.0E 14	SE/SW	1	SCHMIDT CR *			x						
	HOLMES MRS HW	Cert	10/17/1974	DM	0.03	05.0N 01.0E 18	SW/SE	1	UNNAMED SPRING			x						
	HUMMELS LESLIE E	Cert	7/13/1973	IR,DM	0.04	05.0N 01.0E 08		1	LEWIS RIVER			x						
09495	JOHNSON A	Cert	6/22/1964	DM	0.02	06.0N 02.0E 33	NE/SW	1	UNNAMED SPRING			x						
	KRAAKMAN PETER	Cert	5/29/1981	DM	0.11	06.0N 04.0E 19	NW/SE	1	UNNAMED SPRING				x					
	LEE BROWN	NewApp	9/20/1999	DM	0.08	06.0N 01.0E 16		1	KALAMA RIVER	x								
	MAHAFFEY/MCGOWAN	Cert	5/9/1974	DM	0.02	07.0N 01.0W 33	SW/NE	1	UNNAMED STREAM			x						
	MEIZE CHARLES R	Cert	4/23/1970	DM	0.1	06.0N 04.0E 18		1	UNNAMED SPRING				x					
	MICKELWAIT JACK	Cert	8/11/1978	DM	0.02	04.0N 02.0E 13	SE/NE	1	EAST FORK LEWIS R			x						
10080	MODROW C C	Cert	5/18/1955	DM	0.08	06.0N 01.0E 03	SE/SW	1	UNNAMED STREAM			x						
08545	MOLL L H	Cert	11/8/1961	HE,DM	0.07	05.0N 03.0E 16	SE/SW	1	UNNAMED SPRING			x						
01729	MULKEY P A	Cert	5/27/1939	IR,DM	0.07	07.0N 05.0E 28		1	GUNNAR CR *			x						
	MYERS CLARENCE R	Cert	6/13/1973	ST,IR	0.02	06.0N 03.0E 13		1	UNNAMED SPRING		x							
01854	NICCOLLS F I	Cert	3/6/1940	IR,FS	0.45	04.0N 04.0E 22	SW/NW	1	NICHOLS CR		x							
10573	Northern Pacific Railway Co	Cert	1/24/1968	DM	0.25	07.0N 06.0E 27	SE/SE	1	UNNAMED STREAM				x					
10573	Northern Pacific Railway Co	CertChg	1/24/1968	DM	0.25	07.0N 06.0E 27	SE/SE	1	UNNAMED STREAM				x					
	Northern Pacific Railway Co (total SW)				0.5	07.0N 06.0E 27			UNNAMED STREAM				x					
10826	Pacific Power & Light Co	Cert	12/22/1967	DM	0.111	07.0N 04.0E 26	NW/SE	1	YALE LAKE				x					
10827	Pacific Power & Light Co	Cert	12/22/1967	DM	0.111	06.0N 04.0E 04	SW/SE	1	YALE LAKE				x					
	Pacific Power & Light Co (total SW)				0.222	06.0N 04.0E 04			YALE LAKE				x					
	PEASE LES	Cert	5/22/1974	DM	0.01	04.0N 03.0E 18	SE/NE	1	EAST FORK LEWIS R			x						
	POYNER S & BOZARTH A	Cert	10/13/1971	DM	0.04	05.0N 01.0W 12	SE/SE	1	UNNAMED SPRING			x						
	PRICHARD ALBERT ETUX	Cert	4/26/1974	IR,DM	0.03	07.0N 01.0W 35	NE/SW	1	UNNAMED SPRING			x						

Attachment A-1.
Screening Results for WRIA 27
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority, Not Likely Municipal-type use	Grantee Water Right Reservation	First Tier	Second Tier	Third Tier
	REESE ELIZABETH ETAL	Cert	8/24/1970	FR,DM	0.05	06.0N 04.0E 08	SE/SW	1	UNNAMED STREAM			x						
01209	ROBBINS W J	Cert	6/11/1938	IR,DM	0.02	07.0N 04.0E 28	SE/NE	1	UNNAMED SPRING			x						
11546	ROBERTS E V & H M	Cert	6/4/1969	FR,DM	0.05	07.0N 04.0E 26	SW/NE	1	UNNAMED SPRING			x						
10207	ROBERTSON / RENNER	Cert	6/23/1965	DM,CI	0.02	06.0N 04.0E 18	SW/NE	1	UNNAMED SPRING			x						
09818	SCOTBERG E	Cert	6/11/1964	ST,IR	0.015	05.0N 02.0E 07	SE/SE	1	UNNAMED STREAM		x							
	SNELSON CHARLES D	Cert	7/2/1974	DM	0.02	05.0N 03.0E 31	SW/NW	1	UNNAMED SPRING			x						
	STOUT JAMES C	Cert	1/21/1986	FR,DM	0.16	04.0N 01.0E 01	SW/NW	1	RILEY CREEK								x	
	<u>STRAUSS E</u>				0.02	04.0N 03.0E 18			<u>UNNAMED SPRING</u>			x						
07518	STRAUSS E	Cert	6/19/1957	DM	0.01	04.0N 03.0E 18		1	UNNAMED SPRING			x						
07518	STRAUSS E	CertChg	6/19/1957	DM	0.01	04.0N 03.0E 18		1	UNNAMED SPRING			x						
06865	SWANBERG J H	Cert	10/31/1956	DM	0.04	05.0N 02.0E 09	NE/SE	1	UNNAMED SPRING			x						
	SYRING M RICHARD	Cert	2/22/1983	ST,DM	0.02	05.0N 02.0E 04	NW/SW	1	UNNAMED SPRING			x						
	THORNTON WILLIAM C	Cert	11/23/1973	DM	0.02	04.0N 01.0E 01	SW/SW	1	UNNAMED SPRING			x						
01090	USFS/Columbia National Forest	Cert	9/15/1937	FR,DM	0.1	07.0N 05.0E 30	SE/NE	1	UNNAMED SPRING				x					
07362	USFS/Gifford-Pinchot National Forest	Cert	12/11/1957	DM	0.06	08.0N 04.0E 28	NW/SE	1	UNNAMED STREAM			x						
09217	USFS/Gifford-Pinchot National Forest	Cert	5/31/1962	DM	0.056	08.0N 06.0E 23	NW/NE	1	UNNAMED STREAM			x						
06784	USFS/Gifford-Pinchot National Forest	Cert	7/30/1951	DM	0.01	07.0N 06.0E 23	SW/SW	1	UNNAMED STREAM			x						
06999	VEACH C W ET UX	Cert	7/2/1957	DM	0.07	06.0N 03.0E 13	SW/SW	1	UNNAMED SPRING			x						
	WA Department Of Fish & Wildlife	Cert	7/30/1973	DM	0.03	05.0N 02.0E 06	NE/SW	1	UNNAMED STREAM			x						
09625	WA Department Of Fish & Wildlife	Cert	5/3/1965	FS,FR	3	06.0N 01.0E 07	SW/NE	1	UNNAMED STREAM		x							
09624	WA Department Of Fish & Wildlife	Cert	5/3/1965	FS,FR	2	06.0N 01.0E 07	NE/SW	1	UNNAMED STREAM		x							
	WA Department Of Natural Resources	Cert	11/17/1970	DM	0.15	07.0N 06.0E 25	NW/NW	1	UNNAMED SPRING				x					
09890	Weyerhaeuser Timber Co	Cert	11/26/1963	DG	15	07.0N 04.0E 07	SE/NW	1	UNNAMED SPRING				x					x
	WHITNEY ARTHUR H	Cert	10/17/1974	DM	0.04	06.0N 01.0E 07	NE/NE	1	UNNAMED STREAM			x						
09985	Woodland City	Cert	8/5/1966	MU	2.78	05.0N 01.0E 18		1	LEWIS RIVER				x					x
	WOOLDRIDGE T W	Cert	1/14/1980	DM	0.02	04.0N 01.0E 03	SE/SW	1	UNNAMED SPRING			x						
	ZAVOSKY JOSEPH	Cert	10/26/1989	IR,FR	0.03	05.0N 01.0E 34	NW/NW	2	UNNAMED SPRING		x	x						
01531	ZEHNTHAUER C R	Cert	9/14/1935	PO,DM	3.5	06.0N 01.0E 02	SW/SE	1	KNOWLTON CREEK									x
	ZUMSTEIN ROBERT ETAL	Cert	1/2/1974	ST,IR	0.09	05.0N 01.0E 15	SE/NE	1	UNNAMED STREAM		x	x						
Ground Water																		
	AUTREY DONALD	Cert	9/27/1972	DM	0.02	06.0N 04.0E 17	NW/SW	1	WELL			x						
	BALINT CHARLOTTE E	Cert	5/10/1972	IR,DM	0.13	04.0N 01.0E 09	NW/SW	1	WELL								x	
	Battle Ground City	NewApp	5/20/2004	MU	2.67	04.0N 02.0E 33		1		x								
	BAUMAN G C ET AL	Cert	5/2/1972	DM	0.07	07.0N 01.0W 30	SW/NW	1	WELL			x						
	BEERS PAUL E	Cert	9/21/1972	DM	0.01	04.0N 01.0E 21	SW/NW	1	WELL			x						
	BRONNER EARL D ET UX	Cert	5/15/1980	DM	0.02	04.0N 01.0E 11	SW/SW	1	WELL			x						
	BROWN DONALD G	Cert	5/6/1974	DM	0.12	05.0N 01.0E 19		1	WELL				x					
	CARLSON CORAMAE	NewApp	6/25/1993	IR,DM	0.13	04.0N 01.0E 06		1	WELL	x								
	CLARK & PETERS	Cert	6/16/1969	DM	0.04	05.0N 01.0E 33	SW/NW	1	WELL			x						
	Clark Cnty	Cert	4/16/1993	IR,DM	1.34	04.0N 01.0E 16	NE/NE	1	WELL					x				
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM,CI	0.04	04.0N 02.0E 19	NE/SE	1	WELL			x						
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.02	05.0N 01.0E 12	NW/NW	1	WELL			x						
	Clark Cnty Department Of Public Works (total GW)				0.07	04.0N 02.0E 19			WELL			x						
	Clark Cnty Fire Dist 12	Cert	2/1/1988	DM	0.04	04.0N 01.0E 17	SE/NW	1	WELL			x						
	Clark Cnty Fire Dist 12	Cert	4/25/1985	DM	0.04	04.0N 01.0E 22	NE/SE	1	WELL			x						
	Clark Cnty Fire Dist 12 (total GW)				0.08	04.0N 01.0E 17			WELL			x						
	Clark Cnty PUD	Cert	8/13/1986	DM	1.11	04.0N 01.0E 22	NE/NW	1	WELL						x			
	Clark Cnty PUD	Pmt	8/13/1986	MU	0.89	04.0N 02.0E 21		2	WELL						x			
05929	Clark Cnty PUD	Cert	5/5/1967	MU	0.67	05.0N 03.0E 14	SW/NW	1	WELL						x			

Attachment A-1.
Screening Results for WRIA 27
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority, Not Likely Municipal-type use	Grantee Water Right Reservation	First Tier	Second Tier	Third Tier
	Clark Cnty PUD	ChgApp	10/16/2003	DM	0.45	04.0N 01.0E 22		1	WELL						x			
	Clark Cnty PUD	Cert	11/24/1992	DM	0.45	05.0N 01.0E 34		3	WELL						x			
	Clark Cnty PUD	Cert	8/13/1986	DM	0.22	04.0N 02.0E 18	NW/NW	1	WELL						x			
	CLARK CNTY PUD	NewApp	2/20/2001	DM	2.45	04.0N 01.0E 22		1	WELL	x					x			
	Clark Cnty PUD (total GW)				4.32	04.0N 01.0E 22			WELL (multiple)						x			
	Clark Cnty PUD 1	Cert	6/6/1978	DM	0.53	04.0N 02.0E 23	NW/SE	1	WELL				x					
	Clark Cnty PUD 1	NewApp	8/14/2000	MU	2.90	04.0N 01.0E 26		1	WELL	x								
	Clark Cnty PUD 1	NewApp	4/27/2001	DM	2.67	04.0N 01.0E 14		1	WELL	x								
	Clark Cnty PUD 1	NewApp	4/23/2001	DM	2.67	04.0N 01.0E 23		1	WELL	x								
	Clark Public Utilities	ChgApp	10/16/2003	DM	0.45	04.0N 01.0E 22		1	WELL						x			
	Clark Public Utilities	ChgApp	10/16/2003	MU	0.25	04.0N 01.0E 22		1	WELL						x			
	Clark Public Utilities	Cert	11/6/1975	MU	0.09	04.0N 03.0E 02		1	WELL						x			
	Clark Public Utilities	NewApp	3/1/2006	MU	0.11	05.0N 01.0E 18		1		x					x			
	Clark Public Utilities (total GW)				0.78	04.0N 01.0E 22			WELL (multiple)						x			
	Class Dan	Chng/ROE	9/28/2000	DM	0.78	05.0N 01.0W 14		1	WELL				x					
	Columbia Riverfront RV Park	Cert	1/7/1991	DM	0.17	05.0N 01.0W 15		1	WELL				x					
	Columbia Riverfront Rv Park	NewApp	2/3/1997	DM	0.06	05.0N 01.0W 15		1	WELL	x								
	Creagan Dave	NewApp	9/28/2005	IR,DM	0.78	07.0N 06.0E 23		2		x								
	Creagan Dave	NewApp	9/28/2005	DM	0.16	07.0N 05.0E 26		1		x								
	Davidson Robert	NewApp	1/20/1998	DM	0.27	05.0N 01.0E 24		12	WELL	x								
	ENO P E ET AL	Cert	6/7/1974	IR,DM	0.13	04.0N 02.0E 20	NE/SW	1	WELL								x	
	Evangelical Free Church/Anderson Island	Cert	4/18/1990	DM	0.04	05.0N 03.0E 32	NW/SE	1	WELL			x						
	Ferguson Farms	Cert	12/29/1971	ST,DM	0.09	05.0N 01.0E 31		1	WELL				x					
	Foothills Service Co	Cert	5/17/1974	DM	0.60	04.0N 01.0E 35	SE/NW	1	WELL								x	
	FUTTRUP WALTER G	Cert	1/18/1978	ST,IR	0.22	04.0N 01.0E 15	N2/NE	1	WELL		x							
	FUTTRUP WALTER G	Cert	7/7/1977	ST,IR	0.09	04.0N 01.0E 15	NW/NE	1	WELL		x	x						
	G P M Water System	NewApp	3/19/1998	DM	0.07	06.0N 04.0E 20		1	WELL	x		x						
	G P M Water System	NewApp	3/19/1998	DM	0.07	06.0N 04.0E 20		1	WELL	x		x						
	GEHRKE MERLE	Cert	6/10/1974	ST,IR	0.22	04.0N 01.0E 33	NW/NE	1	WELL		x							
	HECK JOHN ET AL	Cert	7/15/1971	DM	0.07	04.0N 02.0E 20		1	WELL			x						
	High Ridge Land Co	Pmt	1/28/2005	MU	0.13	05.0N 01.0E 06		6					x					
	HOFFMAN & EDWARDS	Cert	11/2/1987	DM	0.53	05.0N 03.0E 12	NE/SW	1	WELL								x	
	International Paper Co	Cert	2/4/1972	DM	0.07	05.0N 04.0E 07	SW/NE	1	WELL			x						
	JOHNSON G & D	Cert	10/3/1988	DM	0.04	05.0N 03.0E 21	NE/NW	1	WELL			x						
	Kalama City	Cert	3/8/1974	MU	4.01	07.0N 01.0W 32	E2/SW	1	INFILTRATION TREN				x					
	Kalama City	Cert	2/16/1988	MU	0.95	07.0N 01.0W 32	E2/SW	1	INFILTRATION TREN				x					
	Kalama City	NewApp	7/5/2001	MU	1.73	07.0N 01.0W 32		1	WELL	x								
	Kalama City (total GW)				4.96	07.0N 01.0W 32			INFILTRATION TREN				x					
04337	Kalama Port	Cert	7/24/1961	DM	0.06	06.0N 01.0W 20		1	WELL			x						
	Kelly Crest Water System	Cert	3/18/1985	DM	0.04	07.0N 01.0W 36	E2/NW	1	WELL			x						
	Kelly Crest Water System	NewApp	12/6/1995	DM	0.05	07.0N 01.0W 36		1	WELL	x		x						
	Kelly Crest Water System	NewApp	12/6/1995	DM	0.01	07.0N 01.0W 36		1	WELL	x		x						
	Kings Lakeside Park & Water Association	Cert	10/16/1972	DM	0.02	06.0N 02.0E 23	NE/SW	1	WELL			x						
	Kings Lakeside Park & Water Association	NewApp	11/28/1994	DM	0.11	06.0N 02.0E 23		1	WELL	x								
	KORTES S & H M	Cert	11/26/1974	IR,DM	0.04	05.0N 01.0E 07	SE/NE	1	WELL			x						
01307	LaCenter Town	Cert	8/3/1951	MU	2.23	05.0N 01.0E 34	SW/NE	1	WELL							x		
02925	LaCenter Town	Cert	9/14/1953	MU	0.45	05.0N 01.0E 34	SW/NE	1	WELL							x		
	LaCenter Town (total GW)				2.67	05.0N 01.0E 34			WELL							x		
	Lake Merwin Campers Hiway	Cert	12/24/1995	DM	0.18	06.0N 03.0E 35	NW/NW	1	WELL				x					

Attachment A-1.
Screening Results for WRIA 27
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority, Not Likely Municipal-type use	Grantee Water Right Reservation	First Tier	Second Tier	Third Tier
	Lake Merwin Campers Hiway	NewApp	3/8/2004	DM	0.05	06.0N 03.0E 34		1		x		x						
	Lake Merwin Development Co	Cert	12/24/1975	DM	0.11	06.0N 03.0E 34	SE/NE	1	WELL								x	
	Lake Merwin Development Co	Cert	6/14/1973	DM	0.04	06.0N 03.0E 34	SE/NE	1	WELL								x	
	Lake Merwin Development Co	Cert	12/24/1975	DM	0.02	06.0N 03.0E 35	NW/SW	1	WELL								x	
	Lake Merwin Development Co	Cert	6/14/1973	DM	0.02	06.0N 03.0E 34	W2/SE	1	WELL								x	
	Lake Merwin Development Co	Cert	12/24/1975	DM	0.01	06.0N 03.0E 34	SE/NW	1	WELL								x	
	Lake Merwin Development Co (total GW)				0.39	06.0N 03.0E 34			WELL (multiple)								x	
09190A	Lewis River Golf Course/J C Reeves Co	Chng/ROE	5/9/2005	MU	0.42	05.0N 01.0E 10		1					x					
	MAYNARD GLEN N	Cert	3/29/1984	DM	0.18	05.0N 01.0E 10	NE/NW	1	WELL				x					
	Merry Etta Park Homeowners Association	Cert	5/13/1974	DM	0.13	07.0N 01.0W 34	SE/SE	1	WELL				x					
04327	MOLL L H	Cert	11/8/1961	HE,DM	0.11	05.0N 03.0E 16	SE/SW	1	WELL								x	
	MURPHY ARTHUR	Cert	3/8/1974	ST,IR	0.13	05.0N 01.0E 27	SW/SE	1	WELL		x							
	NORRIS JEROME ET UX	Cert	10/16/1980	IR,DM	0.11	04.0N 01.0E 22	N2/SE	1	WELL								x	
	North Woods Subdivision	Cert	3/17/1977	DM	0.24	07.0N 06.0E 25	NW/SW	1	WELL				x					
	Pacific Corporation	Cert	4/28/1994	IR,DM	0.25	06.0N 02.0E 33	NE/SE	1	WELL					x				
	Pacific Power & Light Co	Cert	2/3/1978	DM	0.08	07.0N 06.0E 34	NE/NE	1	WELL				x					
	Pacific Power & Light Co	Cert	10/20/1975	DM	0.08	07.0N 04.0E 27	SW/SE	1	WELL				x					
	Pacific Power & Light Co	Cert	10/20/1975	DM	0.08	07.0N 04.0E 26		1	WELL				x					
	Pacific Power & Light Co	Cert	12/16/1974	DM	0.07	06.0N 04.0E 04	SW/SE	1	WELL				x					
	Pacific Power & Light Co (total GW)				0.30	07.0N 06.0E 34			WELL (multiple)				x					
	Pacific Wood Treating Corporation	Cert	3/24/1975	DM,Ci	0.33	04.0N 01.0W 24	NW/NE	1	WELL					x				
	Pacific Wood Treating Corporation	Cert	3/10/1975	DM,Ci	0.12	04.0N 01.0W 24	NW/NE	1	WELL					x				
	Pacific Wood Treating Corporation (total GW)				0.46	04.0N 01.0W 24			WELL					x				
	Pacificorp	Cert	5/13/1991	IR,DM	0.08	06.0N 03.0E 36	NW/NE	1	WELL				x					
	Pacificorp	NewApp	7/27/1995	DM	0.11	06.0N 04.0E 32		1	WELL	x								
	Parkside Airpark Owners Association	Cert	3/1/1979	DM	0.22	04.0N 02.0E 22		2	Well 2					x				
	Parkside Development Inc	Cert	4/29/1975	DM	0.10	04.0N 02.0E 22	SW/NE	1	WELL								x	
	Parkside Development Inc (total GW)				0.32	04.0N 02.0E 22			WELL								x	
	PETERSEN F E	Cert	6/26/1970	DM	0.07	06.0N 01.0W 04	NW/NW	1	WELL			x						
	PETERSON J G ET AL	Cert	7/3/1972	DM	0.02	07.0N 01.0W 30	SW/NE	1	WELL			x						
	Pomeroy-Plowman Ranch Limited	Cert	10/20/1983	IR,DM	0.08	04.0N 03.0E 08	SW/SE	1	WELL			x						
	PROUTY DAVID ET AL	Cert	12/7/1973	IR,DM	0.09	04.0N 01.0E 08		1	WELL			x						
	RANDOLPH F ET AL	Cert	3/8/1974	IR,DM	0.49	04.0N 01.0E 36	NE/NW	1	WELL				x					
	Ridgefield City	Cert	8/13/1986	MU	0.67	04.0N 01.0E 19	SE/NW	1	WELL						x			x
	Ridgefield City	Cert	8/13/1986	MU	0.67	04.0N 01.0E 19	SE/NW	1	WELL						x			x
	Ridgefield City	Cert	8/13/1986	MU	0.67	04.0N 01.0E 19	SE/NW	1	WELL						x			x
	Ridgefield City	Cert	7/18/1972	MU	0.67	04.0N 01.0E 19		1	WELL						x			x
	Ridgefield City	Cert	7/18/1972	MU	0.45	04.0N 01.0W 24		1	WELL						x			x
02449	Ridgefield City	Cert	7/19/1955	MU	0.33	04.0N 01.0E 19		1	WELL						x			x
	Ridgefield City	Cert	7/18/1972	MU	0.28	04.0N 01.0W 24		1	WELL						x			x
	Ridgefield City	NewApp	1/3/1995	DM,Ci	0.89	04.0N 01.0E 21		1	WELL	x					x			x
	Ridgefield City (total GW)				3.73	04.0N 01.0E 19			WELL (multiple)						x			x
07199	Ridgefield School Dist 122	Cert	8/31/1967	IR,DM	0.14	04.0N 01.0E 29	E2/SW	1	WELL					x				
	Ridgefield School Dist 122	Cert	9/22/1972	IR,DM	0.07	03.0N 01.0E 03	SE/SW	1	WELL					x				
	Ridgefield School Dist 122 (total GW)				0.21	03.0N 01.0E 03			WELL (multiple)					x				
	RODGERS WB	NewApp	7/6/1993	DM	0.13	06.0N 01.0W 26		2	WELL	x								
	Royal Ridges Retreat	Cert	2/14/1983	DM	0.09	05.0N 03.0E 32	SE/NW	1	WELL			x						
	SIMON GERALD ET AL	Cert	11/1/1976	DM	0.06	06.0N 01.0W 02	N2/NE	1	WELL			x						
	Spirit Lake Relocation Association	Cert	7/14/1986	DM	0.11	07.0N 06.0E 08	NE/NW	1	WELL				x					

Attachment A-1.
Screening Results for WRIA 27
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority, Not Likely Municipal-type use	Grantee Water Right Reservation	First Tier	Second Tier	Third Tier
	Stading Family LLC	Pmt	7/16/1992	MU	0.42	05.0N 01.0E 10		1	WELL				x					
	STOUT JAMES C	Cert	1/21/1986	DM	0.02	04.0N 01.0E 01	SW/NW	1	WELL			x						
	STOUT JAMES C (total GW)				0.06	04.0N 01.0E 01			WELL			x						
	STOUT JR JAMES C	Cert	11/22/1989	DM	0.05	04.0N 01.0E 01	SW/NW	3	WELL			x						
	STOVNER C E & E M	Cert	10/27/1971	ST,DM	0.04	04.0N 01.0E 04	NW/SW	1	WELL			x						
	STUART DON AND LORENE	Cert	1/16/1992	DM	0.06	06.0N 04.0E 18	SE/NE	1	WELL			x						
	THOMAS ALFRED S ETAL	Cert	3/1/1974	DM	0.27	07.0N 04.0E 27	SE/SW	1	WELL				x					
	TRAUTMAN RANDY E	Cert	6/27/1979	DM	0.04	06.0N 01.0W 10	NE/NE	1	WELL			x						
03805	USFS *	Cert	5/26/1959	DM	0.50	07.0N 06.0E 26		1	WELL					x				
03605	USFS *	Cert	10/28/1957	DM	0.18	05.0N 03.0E 12	SE/SW	1	WELL					x				
	USFS (total GW)				0.68	05.0N 03.0E 12			WELL (multiple)					x				
	WA Corrections Dept	Pmt	5/10/1994	DM	0.26	03.0N 04.0E 20		2	WELL					x				
	WA Department Of Fish & Wildlife	Cert	2/17/1977	DM	0.09	06.0N 01.0E 07	NW/SE	1	WELL					x				
	WA Department Of Fish & Wildlife	Cert	1/28/1982	DM	0.02	05.0N 02.0E 08	NW/NE	1	WELL					x				
	WA Department Of Fish & Wildlife (total GW)				0.11	05.0N 02.0E 08			WELL (multiple)					x				
	WA Department Of Natural Resources	Cert	4/5/1972	RE,DM	0.01	03.0N 04.0E 09	NE/NW	1	WELL			x						
	WA Department Of Natural Resources	Cert	7/7/1971	DM	0.01	05.0N 01.0E 21		1	WELL			x						
	WA Department Of Natural Resources	Cert	8/13/1971	IR,FR	0.13	03.0N 04.0E 20	SW/NE	1	WELL		x							
07409	WA Health Department	Cert	8/19/1968	DM	0.09	03.0N 01.0E 03		1	WELL					x				
07401	WA Health Department	Cert	8/19/1968	DM	0.09	04.0N 01.0E 27	NW/SW	1	WELL					x				
	WA Health Department (total GW)				0.18	04.0N 01.0E 27			WELL (multiple)					x				
	WA Parks & Recreation Comm/Paradise	Cert	6/27/1986	DM	0.08	05.0N 01.0E 32	NE/SW	1	WELL					x				
04364	WA Parks & Recreation Commission	Cert	2/1/1962	DM	0.07	04.0N 01.0E 05		1	WELL					x				
	WA Parks & Recreation Commission (total GW)				0.15	05.0N 01.0E 32			WELL (multiple)					x				
	Weyerhaeuser Timber Co	Cert	3/21/1974	DM,CI	0.09	07.0N 02.0E 33	NE/NW	1	WELL			x						
	WINES GLEN R	Cert	9/17/1979	DM	0.02	07.0N 01.0W 34	S2/S2	1	WELL			x						
06595	Woodland City	Cert	11/8/1967	MU	3.12	05.0N 01.0E 18		1	INFILTRATION TREN				x					
	Woodland City	Pmt	6/14/1995	MU	3.12	05.0N 01.0E 18	SW/SW	1	WELL				x					
	Woodland City	ChgApp	4/11/2005	MU	1.78	05.0N 01.0E 18		1	WELL				x					
	Woodland City	NewApp	5/18/2001	DM,CI	4.68	05.0N 01.0E 18		1	WELL	x								
	Woodland City (total GW)				8.02	05.0N 01.0E 18			WELL				x					
	Woodside Merry	Chng/ROE	2/24/2000	DM	0.36	04.0N 02.0E 18		2	WELL								x	
03594	WORTHINGTON P	Cert	10/20/1959	DM,CI	0.10	05.0N 03.0E 16	SW/SW	1	WELL				x					
	Yacolt Town	Cert	4/15/1985	MU	0.67	05.0N 03.0E 35	W2/SW	1	WELL							x		
	Yacolt Town	Cert	5/13/1974	MU	0.27	04.0N 03.0E 02	NW/NW	1	WELL							x		
	Yacolt Town (total GW)				0.94	05.0N 03.0E 35			WELL (multiple)							x		

**Attachment A-2.
Screening Results for WRIA 28
Inchoate Water Rights Review**

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").											Basis for Screening Out					Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
Surface Water																		
01706	ALLEN E M	Cert	4/21/1941	DM	0.04	01.0N 02.0E 12	NW/NE	1	ALLEN SPR *			x						
	ANGELO J ESTATE OF	Cert	5/5/1986	DM	0.05	01.0N 05.0E 03	NE/NW	1	UNNAMED SPRING			x						
08164	BAFUS R	Cert	10/24/1960	ST,IR	0.03	02.0N 03.0E 33	NW/NE	1	UNNAMED SPRING		x							
10315	BAJEMA D / C M	Cert	7/29/1963	IR,DM	0.26	01.0N 05.0E 11	NW/NE	1	UNNAMED SPRING				x				x	
02015	Beacon Lake Corporation	Cert	6/20/1927	IR,DM	0.50	02.0N 06.0E 26	SE/NE	1	BEACON CR *									
	BENNETT W E ET UX	Cert	5/18/1971	ST,DG	0.01	02.0N 05.0E 31	NE/SW	2	UNNAMED SPRING			x						
02702	BLAIR/KLING	Cert	8/22/1946	DM	0.01	03.0N 01.0E 35	NE/NE	1	UNNAMED SPRING			x						
	Blanding Estate Property	NewApp	4/6/1998	DM	0.20	03.0N 01.0E 24		1	UNNAMED SPRING	x								
	BOWCUTT KENNETH L	Cert	10/24/1973	DM	0.20	02.0N 06.0E 35	NW/NE	1	UNNAMED SPRING						x			
00712	Camas City	Cert	8/22/1923	MU	2.50	02.0N 04.0E 04	NW/NE	1	BOULDER CREEK						x			x
00711	Camas City	Cert	9/5/1930	MU	1.00	02.0N 04.0E 03	SE/SW	1	JONES CREEK						x			x
	Camas City (total SW)				3.50	02.0N 04.0E 04			BOULDER + Jones CREEK						x			x
06873	Camp Fire Girls Inc	Cert	4/26/1954	RE,DM	1.00	02.0N 05.0E 27	SE/NW	1	UNNAMED SPRING						x			
01526	CASKEY A O	Cert	4/23/1926	IR,DM	0.10	03.0N 01.0E 35		1	UNNAMED STREAM				x					
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.01	02.0N 03.0E 11	SW/NE	1	UNNAMED SPRING			x						
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.03	03.0N 03.0E 09	NE/NE	1	UNNAMED SPRING			x						
	Clark Cnty Department Of Public Works (total SW)				0.04	02.0N 03.0E 11			UNNAMED SPRING			x						
	DEPT OF GAME	CertChg	9/1/1950	IR,FS	6.00	01.0N 02.0E 03	S2/NE	1	UNNAMED SPRING		x							
10357A	DIMENT E P	Cert	6/23/1967	ST,DM	0.04	03.0N 03.0E 07	NW/NE	2	UNNAMED SPRING			x						
	DOHERTY FRANK E	Cert	6/26/1974	DM	0.06	02.0N 05.0E 29	SW/NW	1	UNNAMED SPRING			x						
00002	EDNER HENRY ET UX	Cert	10/13/1917	IR,DM	0.01	03.0N 02.0E 02	NE/NW	1	WEAVER CREEK			x						
	FRICE MELVIN	Cert	10/1/1984	DM	0.01	02.0N 06.0E 28	NW/NE	1	UNNAMED SPRING			x						
	Gillette Scott	NewApp	3/5/2001	DM	0.08	02.0N 05.0E 19		1	unnamed spring	x								
	GOODE D M ET AL	Cert	10/2/1972	DM	0.05	02.0N 05.0E 34	SW/NW	1	UNNAMED STREAM			x						
	Green Mountain Resort Inc	NewApp	2/17/1995	IR,DM	1.30	02.0N 03.0E 20		1	UNNAMED SPRING	x								
	HANSEN HAROLD	Cert	6/28/1974	DM	0.04	04.0N 03.0E 34	NW/NE	1	UNNAMED SPRING			x						
	HATCH DALE ET UX	Cert	3/6/1972	DM	0.02	02.0N 05.0E 27	W2/SW	2	UNNAMED SPRING			x						
	High Valley Farm	Cert	9/22/1972	IR,FR	0.04	02.0N 06.0E 31		1	MARSHALL CREEK			x						
	JOHNSON KEITH & WANELL	Cert	5/20/1991	ST,DM	0.03	01.0N 05.0E 02	SW/NW	1	UNNAMED SPRING			x						
	JOHNSON KEITH & WANELL	Cert	5/20/1991	DM	0.03	01.0N 05.0E 02	SW/NW	1	UNNAMED SPRING			x						
	JOHNSON KEITH & WANELL (total SW)				0.06	01.0N 05.0E 02			UNNAMED SPRING			x						
	JOHNSON RICHARD C	Cert	6/30/1974	ST,DM	0.02	01.0N 04.0E 11	SW/SE	1	UNNAMED SPRING			x						
01813	LALONDE J R	Cert	2/8/1940	IR,DM	0.04	03.0N 01.0E 36	SE/SE	1	UNNAMED STREAM			x						
01722	LAVER R S	Cert	7/20/1940	IR,DM	0.60	01.0N 04.0E 24	NW/NW	1	LAWTON CREEK				x					
	LEON MICHAEL	NewApp	7/20/1994	DM	0.02	01.0N 05.0E 11		1	UNNAMED SPRING	x		x						
05193	LEWIS ROBERT ET UX	Cert	10/6/1952	DM	0.03	02.0N 05.0E 18		1	UNNAMED STREAM			x						
09417	MACKAY J J ET UX	Cert	3/13/1963	IR,DM	0.03	01.0N 05.0E 11	NE/NW	1	UNNAMED STREAM			x						
	MASON GLEN	Cert	6/20/1974	DM	0.02	01.0N 05.0E 01	SW/SE	1	UNNAMED SPRING			x						
10887A	MAUST ET AL	Cert	4/30/1969	DM	0.02	02.0N 05.0E 27	SE/SE	2	UNNAMED STREAM			x						
	MEDLIN JOHN ET UX	Cert	1/11/1979	DM	0.02	01.0N 06.0E 06	SE/NW	1	UNNAMED SPRING			x						
	MEDLIN JOHN ET UX	Cert	11/4/1977	DM	0.04	01.0N 06.0E 06	SE/NW	1	UNNAMED SPRING			x						
	MEDLIN JOHN ET UX (total SW)				0.06	01.0N 06.0E 06			UNNAMED SPRING			x						
09597	MILLER D B	Cert	6/8/1964	IR,DM	0.01	01.0N 05.0E 19	NE/NE	1	UNNAMED SPRING			x						
01566	MONTAG R T	Cert	6/12/1937	IR,DM	0.10	01.0N 02.0E 02	NW/SW	1	UNNAMED SPRING				x					
	NELSON ROSS	Pmt	11/20/1987	FS,FR	0.04	01.0N 05.0E 17		4	UNNAMED SPRING		x							
	NEWBY/BENZ	Cert	6/27/1974	DM	0.04	02.0N 04.0E 32	SE/SW	1	LITTLE WASHOUGAL			x						
	NEWPORT ERNEST W	Cert	7/21/1980	IR,DM	0.10	02.0N 05.0E 30	SW/NW	1	UNNAMED STREAM									
	PELKEY DAVID ET UX	Cert	4/22/1974	ST,DM	0.05	02.0N 03.0E 14	NE/NE	1	UNNAMED SPRING			x						
	PICKETT LLOYD	Cert	9/5/1980	DM	0.02	02.0N 05.0E 14	NW/NW	1	WASHOUGAL RIVER			x						
08773	PIERCE L H	Cert	2/25/1963	IR,DM	0.07	02.0N 06.0E 25	NE/NE	1	UNNAMED STREAM			x						
	ROSEN STEVEN	Cert	7/2/1974	DM	0.03	02.0N 06.0E 28	NW/NE	1	UNNAMED SPRING			x						
09113	SALMONSON J A / D	Cert	10/18/1963	DM	0.02	01.0N 05.0E 19	NW/NW	1	UNNAMED STREAM			x						

Attachment A-2.
Screening Results for WRIA 28
Inchoate Water Rights Review

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").											Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier	
	SCHLEGEL FRED	Cert	7/1/1974	DM	0.02	02.0N 04.0E 29	SE/NW	1	UNNAMED SPRING			x							
00135	SILVER J B	Cert	9/18/1919	PO,IR	0.07	02.0N 01.0E 15		1	COLD CANYON CR		x								
10337	Skamania Cnty	Cert	6/21/1966	DM	0.05	01.0N 05.0E 05	NE/SE	1	UNNAMED STREAM				x						
10338	Skamania Cnty	Cert	6/21/1966	DM	0.05	01.0N 05.0E 05	SE/NW	1	UNNAMED STREAM				x						
	Skamania Cnty (total SW)				0.10	01.0N 05.0E 05			UNNAMED STREAM				x						
01538	Skamania Cnty School Dist 2	Cert	10/5/1936	DM	0.10	02.0N 06.0E 27	SW/SE	1	UNNAMED SPRING					x					
	Skamania Cnty School Dist 2	Adjct Cert	10/5/1936	DM	0.10	02.0N 06.0E 27	SE/SW	2	KATZNER SPR					x					
	Skamania Cnty School Dist 2	Cert	1/15/1963	DM	0.02	02.0N 06.0E 27	SW/SE	1	KATZMER SPR *					x					
	Skamania Cnty School Dist 2 (total SW)				0.22	02.0N 06.0E 27			KATZMER SPR + other tribs					x					
05242	Skamania Cnty School Dist 5	Cert	10/4/1951	DM	0.02	02.0N 05.0E 19	SW/SE	1	UNNAMED SPRING			x							
	SPEIGHTS T L & H L	Cert	3/23/1972	DM	0.02	03.0N 03.0E 04	N2/SW	1	UNNAMED SPRING			x							
09200	SWIGERT E G	Cert	11/4/1963	RE,DM	0.10	01.0N 05.0E 11	NW/NE	1	UNNAMED SPRING										
	SWIGERT ERNEST G	Cert	11/21/1973	IR,FR	0.22	01.0N 05.0E 02	E2/SE	1	UNNAMED STREAM		x								
	THAGON RAY ET UX	Cert	5/21/1974	DM	0.12	01.0N 05.0E 18	SE/SE	1	UNNAMED SPRING				x						
02484	THOMPSON W A	Cert	1/12/1946	FR,DM	0.10	03.0N 03.0E 10	SE/SE	1	UNNAMED STREAM				x						
01534	THOMPSON W A	Cert	6/4/1936	RE,IR	0.50	03.0N 03.0E 10	SE/SE	1	SALMON CREEK		x								
10833	TOY D & H	Cert	5/12/1969	ST,DM	0.01	01.0N 05.0E 07	NE/NE	1	UNNAMED SPRING			x							
	VANDER VEEN H M	Cert	2/21/1978	DM	0.02	04.0N 03.0E 34	W2/NE	1	UNNAMED SPRING			x							
	VARNEY H A & K G	Cert	6/26/1972	DM	0.02	02.0N 05.0E 28	SE/SE	1	UNNAMED SPRING			x							
03900	WA Department Of Fish & Wildlife	Cert	5/12/1950	FS,DM	2.00	01.0N 02.0E 03		1	UNNAMED STREAM				x					x	
01548	WA Department Of Fish & Wildlife	Cert	9/8/1937	FS,DM	0.08	01.0N 02.0E 03		1	UNNAMED STREAM				x					x	
	WA Department Of Fish & Wildlife	Cert	2/28/1977	DM	0.06	02.0N 05.0E 15	SW/SE	1	BOB CREEK				x					x	
	WA Department Of Fish & Wildlife (total SW)				2.14	01.0N 02.0E 03			UNNAMED STREAM + Bob Creek				x					x	
08376	WA Department Of Natural Resources	Cert	10/5/1959	FR,DM	0.10	02.0N 05.0E 11	SW/SE	1	FORE & AFTER CR *				x						
09997	WALLACE J A	Cert	2/24/1967	DM	0.02	02.0N 04.0E 25	NW/SW	1	UNNAMED SPRING			x							
	WOLFE JOSEPH ET AL	Cert	1/31/1974	IR,DM	0.08	01.0N 05.0E 06	SW/SE	1	UNNAMED SPRING			x							
	YULE DAVID	Cert	6/11/1974	ST,IR	0.04	02.0N 05.0E 19	SW/NW	1	UNNAMED SPRING		x								
Ground Water																			
00137	ALCOA	Cert	3/1/1941	HE,DG	2.23	02.0N 01.0E 19	NW/NE	1	WELL				x						
	Arwana Farms	Cert	11/3/1984	ST,IR	0.31	04.0N 01.0E 32	SE/NE	1	WELL		x								
	BAKER CHARLES V	Cert	3/21/1972	DM	0.06	02.0N 02.0E 01		1	WELL				x						
	BAKER JOE C	Cert	1/16/1974	DM	0.14	02.0N 02.0E 11		1	WELL				x						
	BAKER JOE C (total GW)				0.20	02.0N 02.0E 11			WELL (multiple)				x						
	BARNARD WILMA ET AL	Cert	6/12/1972	ST,DM	0.12	03.0N 02.0E 22	NW/NW	1	WELL								x		
	BARTEL PETER H	Cert	8/5/1985	DM	0.05	04.0N 01.0E 32	NE/NW	1	WELL			x							
	Battle Ground City	Pmt	8/13/1986	MU	1.39	03.0N 02.0E 04	NE/NW	1	Well 35				x					x	
02605	Battle Ground City	Cert	6/3/1954	MU	0.78	03.0N 02.0E 03	NW/NE	1	WELL				x					x	
	Battle Ground City	Cert	8/13/1986	MU	0.78	03.0N 02.0E 04	SE/NE	1	WELL				x					x	
	Battle Ground City	Cert	8/30/1974	MU	0.56	03.0N 02.0E 03	NW/SE	1	WELL				x					x	
	Battle Ground City (total GW)				3.51	03.0N 02.0E 04			WELL (multiple)				x					x	
	Beckman Richard	NewApp	12/30/2005	DM	1.11	02.0N 07.0E 20		2		x									
	BEDROSSIAN R H ET AL	Cert	3/4/1968	IR,DM	0.06	03.0N 01.0E 32		1	WELL			x							
	BENEDICT W & K	Cert	8/13/1986	DM	0.09	03.0N 02.0E 31	NW/NW	1	WELL			x							
07303	BISHOP V R	Cert	8/10/1970	IR,DM	0.22	02.0N 02.0E 28		1	WELL				x						
	BLAIR ALLEN	Cert	5/15/1974	DM	0.07	03.0N 01.0E 05		1	WELL			x							
	BOWCUTT KENNETH L	Cert	6/6/1973	DM	0.07	02.0N 06.0E 35	NW/NE	1	WELL			x							
	BOWLING & JONES	Cert	11/26/1985	DM	0.04	02.0N 05.0E 34	SW/NW	1	WELL			x							
	BRADSHAW & BLAKE	Cert	5/23/1974	DM	0.23	02.0N 03.0E 26	NE/SE	1	WELL								x		
00368	BROWN D A ET AL	Cert	9/5/1935	DM,Ci	0.09	02.0N 07.0E 16	SE/SE	1	WELL			x							
	BRUCE HARRY	Cert	6/27/1974	ST,IR	0.04	02.0N 03.0E 26	NE/NE	1	WELL		x								
	BRYANT FRED ET AL	Cert	1/6/1969	DM	0.13	03.0N 01.0E 09	SW/NE	1	WELL				x						
05080	BUHMAN W	Cert	12/23/1963	DM	0.14	01.0N 03.0E 03	NE/NE	1	WELL									x	
	BUHMAN W (total GW)				0.29	01.0N 03.0E 03			WELL									x	

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Screening Results for WRIA 28
Inchoate Water Rights Review**

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Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
05080	BUHMAN WAYNE ET AL	CertChg	10/22/1973	DM	0.13	01.0N 03.0E 03	NE/NE	1	WELL								x	
	BUSH MORRIS A	Chng/ROE	4/17/1994	DM	0.11	03.0N 02.0E 31		1	WELL				x					
06635	Camas City	Cert	3/22/1968	MU	3.34	01.0N 03.0E 12		1	WELL						x			x
04072	Camas City	Cert	2/12/1959	MU	2.95	01.0N 03.0E 12	W2/NW	1	WELL						x			x
00085	Camas City	Cert	7/21/1945	MU	2.67	01.0N 03.0E 12	NW/SW	1	WELL						x			x
	Camas City	Cert	3/22/1971	MU	2.23	01.0N 03.0E 12		1	WELL						x			x
	Camas City	Chng/ROE	3/9/2001	MU	2.01	01.0N 03.0E 12		1	WELL						x			x
	Camas City	Chng/ROE	4/6/2001	MU	2.01	01.0N 03.0E 12		1	WELL						x			x
	Camas City	Cert	2/4/1977	MU	2.01	01.0N 03.0E 12		1	WELL						x			x
	Camas City	Cert	8/13/1986	MU	1.45	01.0N 03.0E 04		1	WELL						x			x
06636	Camas City	Cert	3/22/1968	MU	1.34	01.0N 03.0E 12		1	WELL						x			x
	CAMAS CITY	NewApp	8/21/2003	DM	2.23	01.0N 03.0E 12		1		x								
	Camas City	NewApp	8/21/2003	DM	2.23	01.0N 03.0E 12		1		x								
	Camas City	NewApp	8/21/2003	DM	2.23	01.0N 03.0E 12		1		x								
	Camas City	NewApp	9/4/2001	MU	0.78	02.0N 03.0E 33		1	WELL	x								
	CAMAS CITY	NewApp	8/21/2003	DM	1.11	01.0N 03.0E 12		6	Well 4	x								
	Camas City	NewApp	9/4/2001	MU	2.23	02.0N 03.0E 28		2	WELL#1	x								
	Camas City (total GW)				20.00	01.0N 03.0E 12			WELL (multiple)						x			
	Camp Fire Girls Inc/Cascade Council	Cert	12/27/1983	DM	0.06	02.0N 05.0E 27	E2/SW	1	WELL			x						
	Carl Enterprises Inc	Cert	8/13/1986	DM	0.67	02.0N 02.0E 25	SE/SE	1	WELL				x					
	CASPER EDWIN ET AL	Cert	9/1/1978	DM	0.07	02.0N 03.0E 19	SW/SE	1	WELL			x						
	Clark Arlen	NewApp	3/15/2002	IR,DM	0.04	03.0N 01.0E 11		1	WELL	x								
	Clark Cnty Department Of Public Works	Cert	1/25/1974	IR,DM	0.33	03.0N 01.0E 19	SW/NE	1	WELL				x					
	Clark Cnty Department Of Public Works	Cert	1/2/1974	DM	0.03	02.0N 02.0E 03		1	WELL				x					
	Clark Cnty Dept Of Parks & Recreation	Cert	1/15/1974	IR,DM	0.22	02.0N 01.0E 07	W2/NW	1	WELL				x					
	Clark Cnty DPW/Parks (total GW)				0.58	02.0N 02.0E 03			WELL (multiple)				x					
04446	Clark Cnty Fair Association	Cert	6/22/1959	IR,DG	0.17	03.0N 01.0E 15	S2/NE	1	WELL				x					
	Clark Cnty PUD	Cert	8/13/1986	DM	2.90	03.0N 01.0E 27	SE/SW	1	WELL				x					x
	Clark Cnty PUD	Pmt	8/16/1986	MU	2.67	03.0N 02.0E 08		1	WELL				x					x
00549	Clark Cnty PUD	Cert	4/21/1971	MU	1.34	04.0N 03.0E 28	SE/SE	1	WELL				x					x
	Clark Cnty PUD	Pmt	8/13/1986	DM	1.34	03.0N 01.0E 24		1	WELL				x					x
	Clark Cnty PUD	Cert	8/13/1986	MU	1.11	03.0N 01.0E 36	NE/SW	2	WELL				x					x
	Clark Cnty PUD	Cert	5/11/1976	MU	0.95	03.0N 02.0E 20	SE/NE	1	WELL				x					x
	Clark Cnty PUD	Cert	7/17/1975	DM	0.89	03.0N 02.0E 35	NW/NW	1	WELL				x					x
	Clark Cnty PUD	Cert	8/13/1986	MU	0.78	03.0N 02.0E 28		1	WELL				x					x
02073B	Clark Cnty PUD	Cert	9/14/1953	MU	0.71	02.0N 01.0E 11	NE/NW	1	WELL				x					x
	Clark Cnty PUD	Pmt	5/25/1989	MU	0.67	04.0N 03.0E 29		1	WELL				x					x
	Clark Cnty PUD	ChgApp	12/20/2004	MU	0.61	03.0N 01.0E 28	SW/SW	1	WELL#13.1				x					x
	Clark Cnty PUD	Pmt	8/13/1986	MU	0.60	03.0N 01.0E 13		1	WELL				x					x
	Clark Cnty PUD	Cert	8/13/1986	MU	0.33	03.0N 03.0E 03	SE/SW	1	WELL				x					x
	Clark Cnty PUD	Cert	8/13/1986	DM	0.31	02.0N 03.0E 32	NW/SW	2	WELL				x					x
07189	Clark Cnty PUD	Cert	8/4/1966	DM	0.13	03.0N 02.0E 23	NE/NW	1	WELL				x					x
	Clark Cnty PUD	Cert	5/22/1989	DM	0.09	04.0N 03.0E 35	NE/SW	1	WELL				x					x
	Clark Cnty PUD	NewApp	9/27/1995	MU	1.34	02.0N 03.0E 06		1	WELL	x								x
	Clark Cnty PUD	NewApp	10/9/1995	DM	0.33	02.0N 03.0E 29		2	WELL	x								x
	Clark Cnty PUD	NewApp	11/24/1992	IR,DM	0.33	02.0N 03.0E 17		1	WELL	x								x
	Clark Cnty PUD #1	Cert	8/30/1982	MU	2.23	03.0N 01.0E 27	SE/SW	1	WELL #19				x					x
	Clark Cnty PUD (total GW)				32.50	03.0N 01.0E 27			WELL (multiple)				x					x
	Clark Cnty PUD 1	Cert	4/9/1982	MU	2.23	03.0N 01.0E 27	SE/SE	1	WELL				x					x
	Clark Cnty PUD 1	Cert	6/15/1981	MU	1.78	03.0N 01.0E 35	NW/NE	1	WELL				x					x
	Clark Cnty PUD 1	Cert	2/1/1977	DM	1.67	03.0N 01.0E 21	SE/SW	1	WELL				x					x
	Clark Cnty PUD 1	Cert	2/1/1977	DM	1.67	03.0N 01.0E 28	SW/SW	1	WELL				x					x
	Clark Cnty PUD 1	Cert	3/8/1972	MU	1.34	03.0N 02.0E 31	NW/SW	1	WELL				x					x

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Screening Results for WRIA 28
Inchoate Water Rights Review**

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
05515	Clark Cnty PUD 1	Cert	4/2/1963	DM	1.34	03.0N 01.0E 35	NW/NE	1	WELL				x					x
02292	Clark Cnty PUD 1	Cert	6/6/1951	IR,DM	0.89	03.0N 01.0E 34	SE/SE	1	WELL				x					x
	Clark Cnty PUD 1	Cert	3/8/1972	MU	0.61	03.0N 01.0E 33	SW/SE	1	WELL				x					x
05921	Clark Cnty PUD 1	Cert	9/22/1966	DM	0.45	03.0N 01.0E 35	NW/NE	1	WELL				x					x
	Clark Cnty PUD 1	Cert	11/16/1970	DM	0.28	03.0N 01.0E 23	NW/SW	1	WELL				x					x
	Clark Cnty PUD 1	Cert	10/23/1973	MU	0.22	03.0N 01.0E 28	SW/SW	1	WELL				x					x
	Clark Cnty PUD 1	NewApp	4/16/2001	DM	55.70	02.0N 01.0E 17		1	WELL	x			x					x
	Clark Cnty PUD Morning Meadows	Cert	7/14/1986	DM	0.40	02.0N 03.0E 29	NW/NW	2	WELL				x					
00720	Clark Cnty School Dist 115	Cert	8/14/1940	IR,DM	0.22	04.0N 02.0E 34	SE/SE	1	WELL					x				
02892	Clark Cnty School Dist 37	Cert	10/19/1955	IR,DM	0.33	02.0N 01.0E 24		1	WELL				x					
	CLARK COUNTY PUD 1	Cert	3/8/1972	MU	1.34	03.0N 01.0E 31	SW/SW	1	Well				x					x
	CLARK COUNTY PUD 1	Cert	3/8/1972	MU	0.61	03.0N 01.0E 33	SW/SE	1	Well				x					x
	CLARK JIM	Cert	2/25/1976	IR,DM	0.07	03.0N 02.0E 04	NW/NE	1	WELL				x					
	Clark Public Utilities	Pmt	8/13/1986	MU	3.34	02.0N 01.0E 11		1	WELL				x					x
	Clark Public Utilities	Pmt	8/13/1986	MU	2.67	03.0N 02.0E 08		1	Well				x					x
0947	Clark Public Utilities	CertChg	10/1/1950	MU	2.23	02.0N 01.0E 01		1	WELL				x					x
0947	Clark Public Utilities	Cert	10/10/1950	MU	2.23	02.0N 01.0E 01		1	WELL				x					x
02595	Clark Public Utilities	Cert	12/23/1955	IR,DM	2.23	02.0N 01.0E 11	NE/NW	1	WELL				x					x
04098	Clark Public Utilities	Cert	10/10/1960	DM	2.23	02.0N 01.0E 11	NE/NE	1	WELL				x					x
	Clark Public Utilities	Cert	8/13/1986	MU	1.56	04.0N 01.0E 22		1	Well#30 (AAIS22)				x					x
	Clark Public Utilities	Cert	8/13/1986	DM	1.56	02.0N 01.0E 02	NE/SW	1	WELL				x					x
03422	Clark Public Utilities	Cert	2/4/1959	DM	1.45	02.0N 01.0E 11	NE/NW	1	WELL				x					x
	Clark Public Utilities	Chng/ROE	4/29/2005	MU	1.39	03.0N 02.0E 08		1	WELL				x					x
	Clark Public Utilities	Pmt	8/13/1986	DM	1.23	02.0N 01.0E 11		1	WELL				x					x
	Clark Public Utilities	Cert	8/13/1986	MU	1.16	02.0N 01.0E 01	NE/NW	1	well				x					x
03982	Clark Public Utilities	Cert	10/10/1960	MU	1.00	02.0N 01.0E 04	NE/NW	1	WELL				x					x
2284	Clark Public Utilities	Cert	10/18/1954	MU	0.84	03.0N 02.0E 08		1					x					x
02073A	Clark Public Utilities	Cert	9/14/1953	MU	0.40	02.0N 01.0E 11	NE/NW	1	WELL				x					x
	Clark Public Utilities	Pmt	12/23/1988	MU	0.33	02.0N 01.0E 04		1	WELL				x					x
	Clark Public Utilities	NewApp	12/6/2006	MU	15.60	02.0N 01.0E 09		2		x			x					x
	Clark Public Utilities	NewApp	4/24/2003	DM	2.45	03.0N 02.0E 08		1		x			x					x
	Clark Public Utilities (total GW)				25.85	02.0N 01.0E 11			WELL (multiple)				x					x
	COLE H ROBERT ET UX	Cert	6/3/1975	DM	0.12	02.0N 05.0E 11	SE/SW	1	WELL								x	
00128	Columbia Academy	Cert	12/5/1947	IR,DM	0.06	03.0N 02.0E 09	SE/NE	1	WELL			x						
	COONROD & MODRELL	Cert	8/12/1971	IR,DM	0.11	02.0N 03.0E 19	NW/NW	1	WELL								x	
	Country Manor Mobile Village Inc	Cert	11/29/1977	DM	0.22	03.0N 02.0E 22	N2/NE	1	WELL								x	
	Davis Robert	NewApp	9/17/1998	DM	0.06	03.0N 02.0E 35		1	WELL	x								
	DEBORAH SULLIVAN	Cert	6/30/1976	DM	0.36	02.0N 07.0E 20	NE/SW	1	WELL				x					
	DEGROOTE GEORGE D	Cert	8/9/1984	DM	0.17	02.0N 07.0E 20	NW/SW	1	WELL				x					
	DEL GROSSO LLOYD T	Cert	3/24/1974	ST,IR	0.07	03.0N 03.0E 29	NW/SW	1	WELL		x							
	East Ridge Partnership	Cert	10/23/1979	DM	0.08	03.0N 03.0E 26	SE/NW	1	WELL			x						
	EGGEBRAATEN ALFRED L	Cert	11/28/1973	DM	0.09	02.0N 02.0E 23	NW/SW	1	WELL			x						
	EIPaso Natural Gas Co	Cert	9/27/1971	DM	0.04	02.0N 04.0E 30	SE/NW	1	WELL				x					
04429	EIPaso Natural Gas Co	Cert	8/30/1961	DG	0.06	03.0N 02.0E 05	NE/NE	1	WELL				x					
	EIPaso Natural Gas Co (total GW)				0.09	02.0N 04.0E 30			WELL			x						
04341	ENGLEMAN C L	Cert	3/16/1962	DM	0.05	02.0N 05.0E 18		1	WELL								x	
	ENGLEMAN C L (total GW)				0.27	02.0N 05.0E 18			WELL								x	
	ENGLEMAN NANCY E	Cert	10/23/1973	DM	0.22	02.0N 05.0E 18	SW/NE	1	WELL				x					
06183	EVANSON C C ET AL	Cert	2/16/1966	FR,DM	0.13	01.0N 02.0E 03		1	WELL				x					
	Evergreen School Dist 114	Cert	12/28/1973	IR,DM	0.67	02.0N 02.0E 23	SE/SW	1	WELL				x					
01490	Evergreen School Dist 114	Cert	12/20/1951	IR,DM	0.45	02.0N 02.0E 23	SE/SE	1	WELL				x					
	Evergreen School Dist 114	Cert	12/28/1973	DM,Ci	0.33	02.0N 02.0E 23	NE/SW	1	WELL				x					
	Evergreen School Dist 114	Cert	12/28/1973	IR,DM	0.06	02.0N 02.0E 11	NE/NW	1	WELL				x					

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Screening Results for WRIA 28
Inchoate Water Rights Review**

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Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 & 5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
	Evergreen School Dist 114 (total GW)				1.50	02.0N 02.0E 23			WELL (multiple)				x					
	Firlock Water Co	Cert	11/14/1973	DM	0.02	01.0N 04.0E 05		1	WELL			x						
	Foothills Service Co	Cert	5/31/1974	DM	0.09	01.0N 03.0E 09	NW/NE	1	WELL			x						
	FRASIER TOMMY	Cert	7/3/1974	ST,IR	0.04	03.0N 01.0E 13	NW/NE	1	WELL		x							
	Golden West Mobile Manor	Cert	7/23/1979	DM	0.20	02.0N 02.0E 10		3	WELL				x					
05136	Green & Carl Construction	Cert	10/4/1963	DM	0.13	01.0N 04.0E 09		1	WELL					x				
	Green Meadows Golf Course Inc	Cert	7/23/1984	DM	0.21	02.0N 02.0E 08	NE/NW	1	WELL				x					
	Greenway Terrace Mobile Estates	Cert	1/20/1971	IR,DM	0.43	02.0N 02.0E 09		2	WELL				x					
04355	GRIFFITH A T	Cert	5/23/1961	DM	0.04	02.0N 02.0E 10		1	WELL			x						
	GROENEVELD P.	Cert	4/29/1980	DM	0.45	01.0N 03.0E 08		2	WELL				x					
	HAAGEN LEROY ET AL	Cert	6/16/1972	DM,CI	0.11	02.0N 02.0E 25	SW/SE	1	WELL				x					
	HAAGEN LEROY ET AL	Cert	6/16/1972	DM,CI	0.11	02.0N 02.0E 25		1	WELL				x					
01474	HAAGEN LEROY G	Cert	5/19/1952	DM,CI	0.27	02.0N 02.0E 25	SE/SE	1	WELL				x					
	HAAGEN LEROY G (total GW)				0.76	02.0N 02.0E 25			WELL				x					
01474	HAAAGEN LEROY G.	CertChg	10/22/1973	DM,CI	0.27	02.0N 02.0E 25	SE/SE	1	WELL				x					
	Hagedorn Inc	Cert	5/6/1982	DM	0.07	02.0N 04.0E 24	NW/SW	1	WELL			x						
	HALL JACK L	Cert	7/30/1970	DM	0.22	02.0N 01.0E 13	NE/SW	1	WELL				x					
	HEERMANN E M	Cert	10/21/1969	DM	0.11	03.0N 01.0E 27	SW/NW	1	WELL				x					
	HEINZ LEONARD C	Cert	10/27/1970	DM	0.17	03.0N 02.0E 31		1	WELL				x					
	HESSLER JAMES	Cert	9/17/1984	HE,FR	0.11	03.0N 03.0E 10	SE/SE	1	WELL		x							
	HUENNEKENS TRAVIS	Cert	9/27/1976	IR,DM	0.16	03.0N 02.0E 22	SW/NE	1	WELL								x	
	Huntington Dan	NewApp	2/5/1999	DM	0.20	01.0N 05.0E 04		6	WELL	x								
	JOHNSON DAVID P	Cert	3/25/1985	DM	0.02	01.0N 04.0E 11	SW/SE	1	WELL			x						
	JOHNSON T HARVEY	Cert	5/20/1974	IR,FR	0.07	03.0N 01.0E 10		1	WELL		x							
	KARNATH JAMES G	Cert	6/28/1974	ST,IR	0.07	03.0N 02.0E 33	SW/SE	1	WELL		x							
	KELLER JACOB	Cert	6/13/1974	IR,DM	0.16	02.0N 02.0E 22	SE/SW	1	WELL				x					
	KIANDER VIV ETAL	Cert	8/13/1986	DM	0.06	01.0N 02.0E 12		2	WELL			x						
	KITTLESON RAYMOND J	Cert	4/28/1980	DM	0.33	02.0N 02.0E 25	SE/SE	1	WELL				x					
	KITTLESON RAYMOND J	Cert	6/16/1972	DM,CI	0.11	02.0N 02.0E 25	SE/SE	1	WELL				x					
	KITTLESON RAYMOND J (total GW)				0.45	02.0N 02.0E 25			WELL				x					
05575	KNABLE W W	Cert	2/28/1966	IR,DS	0.07	02.0N 02.0E 04		1	WELL			x						
	Lackamas Valley Milling Co	Cert	7/23/1974	DM	0.07	02.0N 03.0E 17	NW/SE	1	WELL			x						
	Livingston Mountain Homeowners Assn Inc	Cert	6/28/1991	DM	0.09	02.0N 03.0E 12	NW/SE	1	WELL								x	
	Livingston Mountain Homeowners Assn Inc	Cert	7/18/1991	DM	0.04	02.0N 03.0E 12	NW/SE	1	WELL								x	
	Livingston Mountain Homeowners Assn Inc (total GW)				0.13	02.0N 03.0E 12			WELL								x	
02282	MAKI A G / MICKEY C	Cert	8/31/1951	IR,DM	0.14	03.0N 01.0E 20	NE/NW	1	WELL				x					
	Mann Cindy Jo	NewApp	1/13/1998	DM	0.02	02.0N 03.0E 19		1	WELL	x								
	Matson Roy	Chng/ROE	8/3/2000	IR,DY	0.18	03.0N 03.0E 31		1	WELL		x							
	MAY JAMES R ET UX	Cert	2/17/1982	DM	0.04	01.0N 05.0E 11		1	WELL			x						
	MCBAIN * HOCKINSON	Cert	4/8/1974	DM	0.13	03.0N 03.0E 28	N2/NW	1	WELL								x	
	MCMAHAN CAROL A	Cert	4/9/1979	DM	0.13	02.0N 02.0E 36	SE/SE	1	WELL				x					x
	Meadow Glade Water Association Inc	Cert	7/17/1986	DM	1.18	03.0N 02.0E 05	W2/SE	1	WELL				x					x
	Meadow Glade Water Association Inc	Cert	8/13/1986	DM	0.56	03.0N 02.0E 08		1	WELL				x					x
	Meadow Glade Water Association Inc	Cert	8/13/1986	DM	0.42	03.0N 02.0E 08	NE/SW	1	WELL				x					x
	Meadow Glade Water Association Inc	Cert	8/25/1976	DM	0.33	03.0N 02.0E 04		1	WELL				x					x
	Meadow Glade Water Association Inc	Cert	6/29/1967	DM	0.29	03.0N 02.0E 03	SE/SE	1	WELL				x					x
	Meadow Glade Water Association Inc (total GW)				2.79	03.0N 02.0E 05			WELL (multiple)				x					x
	MEININGER EARL D	Cert	3/29/1988	DM	0.04	02.0N 05.0E 32	NE/SW	1	WELL			x						
	MILLER DELLA	Cert	11/10/1992	DM	0.02	01.0N 05.0E 19	NE/NE	1	WELL			x						
05738	MROCZEK J S SR	Cert	11/22/1965	IR,DM	0.07	02.0N 02.0E 10		1	WELL			x						
	MUNCTON EDWIN	Cert	3/8/1974	ST,IR	0.04	03.0N 01.0E 27	NW/NW	1	WELL		x							
	New Heights Baptist Church	NewApp	10/1/2001	DM	0.17	02.0N 02.0E 06		1	WELL	x								
	NIELSEN ORVIN/JENS	Cert	7/17/1978	DM	0.39	01.0N 03.0E 06		1	WELL				x					x

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Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
01028	North Bonneville City	Pmt	8/26/1981	MU,CI	2.51	02.0N 07.0E 21		2	WELL				x					x
	North Bonneville City	Cert	3/22/1947	MU	0.84	02.0N 07.0E 21	SE/NE	1	WELL				x					x
	North Bonneville City (total GW)				3.35	02.0N 07.0E 21			WELL				x					x
	Norwood Homes Inc	Cert	8/25/1978	DM	0.17	02.0N 03.0E 31		1	WELL				x					
	Norwood Homes Inc	Cert	6/17/1982	DM	0.08	03.0N 03.0E 23	NW/NE	1	WELL				x					
	Norwood Homes Inc (total GW)				0.25	02.0N 03.0E 31			WELL (multiple)				x					
03437	Orchard Water Works Inc	Cert	9/23/1957	FR,DM	1.67	02.0N 02.0E 10		1	WELL				x					
	OSTRUM BASIL	Cert	12/20/1974	IR,DM	0.06	02.0N 02.0E 17		1	WELL				x					
	Pacific Rock Products	NewApp	1/19/1995	DM,CI	1.11	02.0N 03.0E 30		1	WELL	x								
03870	PARKER G G	Cert	9/14/1959	IR,DM	0.22	02.0N 02.0E 27		1	WELL				x					
	Parks & Recreation Commission	Cert	9/12/1994	DM	0.13	02.0N 06.0E 26	NE/SE	1	WELL				x					
	Parks & Recreation Commission	NewApp	2/22/2002	DM	0.09	02.0N 06.0E 35		1	WELL	x								
	Prairie Community Church Inc	Cert	6/5/1985	IR,DM	0.11	03.0N 02.0E 34	NW/SW	1	WELL					x				
	Prairie Recreation Field Inc	Cert	6/2/1975	IR,DM	0.13	03.0N 02.0E 23	NW/SW	1	WELL				x					
06933	PYLKKI R	Cert	5/22/1968	IR,DM	0.07	03.0N 02.0E 07	NE/NW	1	WELL			x						
	QUATTLEBAUM GEORGE	Cert	6/26/1974	IR,DM	0.04	03.0N 01.0E 01	NW/NW	1	WELL			x						
	R & R Joint Venture	Cert	3/7/1979	DM,CI	1.11	02.0N 03.0E 30	NW/NE	1	WELL					x				x
	Rio Vista Water Co Inc	Cert	7/6/1976	DM	0.17	01.0N 02.0E 11		1	WELL				x					
	Riverside Estates Association	Cert	6/5/1980	MU	0.09	02.0N 05.0E 29		1	WELL			x						
01012	ROBERTS DON D	Cert	2/13/1981	DM	0.22	04.0N 02.0E 35	E2/SE	1	WELL				x					
	Royal Oaks Land Association Inc	Cert	6/14/1946	IR,DM	1.45	02.0N 02.0E 17	SE/SE	1	WELL				x					
	SCROGGIE JAMES A	Cert	3/1/1971	DM	0.22	02.0N 02.0E 22	SW/NW	1	WELL				x					
	Skamania Cnty PUD 1 & Donald Eby	Cert	11/19/1973	DM	0.03	02.0N 05.0E 32		1	WELL			x						
	Skamania Cnty School Dist 2	Cert	7/3/1975	IR,DM	0.04	02.0N 06.0E 34	SW/NE	1	WELL			x						
	Skamania Landing Owners Association	Pmt	2/2/1995	MU	0.20	02.0N 06.0E 34		1	WELL				x					
	Skamania Landing Owners Association	Cert	6/9/1971	DM	0.14	02.0N 06.0E 34		1	WELL				x					
	Skamania Landing Owners Association	NewApp	9/7/2006	DM	0.56	02.0N 06.0E 34		1		x								
	Skamania Landing Owners Association (total GW)				0.33	02.0N 06.0E 34			WELL				x					
	SLOSAR JOE ET UX	Cert	2/23/1973	DM	0.13	02.0N 03.0E 16	NW/NW	1	WELL								x	
	SLOSAR JOE ET UX	Cert	10/14/1977	DM	0.09	02.0N 03.0E 16	NW/NW	1	WELL								x	
	SLOSAR JOE ET UX (total GW)				0.22	02.0N 03.0E 16			WELL								x	
00817	Spokane Portland & Seattle Railway Co	Cert	8/22/1930	RW,DG	1.78	02.0N 01.0E 21	NE/NE	1	WELL				x					
	Tall Timber Homeowners Association	Cert	8/31/1973	DM	0.13	03.0N 01.0E 08	NE/NE	1	WELL				x					
	TRUAX RICHARD	NewApp	12/5/1994	DM	0.10	03.0N 01.0E 12		1	WELL	x								
	UNGER J & C	Cert	6/10/1988	DM	0.09	01.0N 05.0E 06	NW/NE	1	WELL			x						
00387	US Federal Highway Administration	Cert	12/8/1942	DM	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00389	US Federal Highway Administration	Cert	12/23/1942	DM	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00390	US Federal Highway Administration	Cert	12/20/1943	DM	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00391	US Federal Highway Administration	Cert	12/22/1943	DM	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00392	US Federal Highway Administration	Cert	1/5/1944	DM	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00395	US Federal Highway Administration	Cert	2/24/1943	DM	2.23	02.0N 01.0E 21	SE/NW	1	WELL				x					x
00396	US Federal Highway Administration	Cert	11/30/1942	DM	2.23	02.0N 01.0E 21	NE/NW	1	WELL				x					x
00393	US Federal Highway Administration	Cert	1/1/1942	DM	0.61	02.0N 02.0E 30	NE/NW	1	WELL				x					x
00394	US Federal Highway Administration	Cert	1/1/1933	DM	0.30	02.0N 02.0E 30	SW/SE	1	WELL				x					x
	US Federal Highway Administration (total GW)				16.51	02.0N 01.0E 36			WELL (multiple)				x					x
	USARMY Corp Of Engineers	Cert	2/11/1976	MU	2.23	02.0N 07.0E 21	NE/NW	1	WELL				x					x
	USARMY Corp Of Engineers	Chng/ROE	9/1/1995	DM	0.09	02.0N 07.0E 15	SE/SE	1	WELL				x					x
	USARMY Corp Of Engineers	Cert	8/31/1983	IR,HE	2.45	02.0N 07.0E 22	NE/NW	2	WELL		x							
	USARMY Corp Of Engineers (total GW)				2.32	02.0N 07.0E 21			WELL (multiple)				x					x
00134	Yanacoe Inc/ALCOA	Cert	9/23/1940	HE,DG	2.23	02.0N 01.0E 19		10	WELL				x					x
00136	Yanacoe Inc/ALCOA	Cert	1/1/1941	HE,DG	2.23	02.0N 01.0E 19		10	WELL				x					x
	Yanacoe Inc/ALCOA (total GW)				4.46	02.0N 01.0E 19			WELL				x					x
	Vancouver City	Cert	3/2/1983	MU	26.74	02.0N 01.0E 23		6	WELL				x					x

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Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
	Vancouver City	Chng/ROE	10/12/2000	MU	22.28	02.0N 01.0E 27		1	WELL				x					x
	Vancouver City	Cert	7/21/1981	MU	11.14	02.0N 02.0E 20	SW/NE	1	WELL				x					x
03647	Vancouver City	Chng/ROE	12/22/1959	MU	9.47	02.0N 01.0E 27		1	WELL				x					x
	Vancouver City	Pmt	8/13/1986	MU	6.68	02.0N 02.0E 33		1	WELL				x					x
	Vancouver City	Cert	8/11/1980	MU	6.68	02.0N 02.0E 14	SE/SE	1	WELL				x					x
	Vancouver City	Cert	8/13/1986	MU	6.68	02.0N 02.0E 33		1	WELL				x					x
	Vancouver City	Cert	8/13/1986	MU	6.68	02.0N 02.0E 33		1	WELL				x					x
	Vancouver City	Cert	6/14/1974	MU	6.24	02.0N 02.0E 14	SE/SE	1	WELL				x					x
00386	Vancouver City	CertChg	12/20/1942	MU	5.57	02.0N 01.0E 36	NW/NE	1	WELL				x					x
	Vancouver City	Cert	8/11/1980	MU	5.57	02.0N 02.0E 14	SW/SE	1	WELL				x					x
00386	Vancouver City	Cert	12/20/1942	MU	5.57	02.0N 01.0E 36	NW/NE	1	WELL				x					x
	Vancouver City	Cert	8/13/1986	MU	5.57	02.0N 02.0E 14	SW/SE	1	WELL				x					x
00388	Vancouver City	CertChg	12/14/1942	MU	5.35	02.0N 01.0E 36	NW/NE	1	WELL				x					x
00388	Vancouver City	Cert	12/14/1942	MU	5.35	02.0N 01.0E 36	NW/NE	1	WELL				x					x
04920	Vancouver City	Cert	2/16/1962	MU,CI	4.90	02.0N 01.0E 23		1	WELL				x					x
	Vancouver City	Cert	9/10/1979	MU	4.46	02.0N 01.0E 15	SW/SE	1	WELL				x					x
	Vancouver City	Cert	11/27/1974	MU	4.46	02.0N 01.0E 23	SE/SE	1	WELL				x					x
	Vancouver City	Cert	5/7/1969	MU	4.46	02.0N 02.0E 18	SW/NE	1	WELL				x					x
01745	Vancouver City	Cert	1/11/1951	MU	4.46	02.0N 01.0E 15		1	WELL				x					x
00064	Vancouver City	Cert	3/1/1939	MU	4.46	02.0N 01.0E 23		1	WELL				x					x
00065	Vancouver City	Cert	1/1/1939	MU	4.46	02.0N 01.0E 23		1	WELL				x					x
00066	Vancouver City	Cert	9/1/1943	MU	4.46	02.0N 01.0E 23		1	WELL				x					x
00014	Vancouver City	Cert	1/26/1946	MU	4.46	02.0N 01.0E 15		1	WELL				x					x
	Vancouver City	Cert	12/4/1972	DM	4.46	02.0N 02.0E 10		1	WELL				x					x
	Vancouver City	CertChg	4/7/1985	DM	3.12	02.0N 01.0E 36		1	WELL				x					x
	Vancouver City	CertChg	8/1/1942	DG	3.12	02.0N 01.0E 36		1	WELL				x					x
	Vancouver City	Cert	1/28/1984	DG	3.01	02.0N 01.0E 28	NE/NW	1	WELL				x					x
	Vancouver City	Cert	5/7/1969	MU	2.79	02.0N 02.0E 27		1	WELL				x					x
00067	Vancouver City	Cert	6/1/1944	MU	2.67	02.0N 01.0E 23		1	WELL				x					x
	Vancouver City	Cert	8/13/1986	MU	2.67	02.0N 02.0E 07		1	WELL				x					x
	Vancouver City	Cert	8/11/1980	MU	2.23	02.0N 02.0E 07	NE/NE	1	WELL				x					x
	Vancouver City	Cert	9/10/1979	MU	2.23	02.0N 02.0E 07	NE/NE	1	WELL				x					x
01649	Vancouver City	Cert	1/23/1952	MU	2.23	02.0N 01.0E 36	NW/NE	1	WELL				x					x
	Vancouver City	Cert	9/10/1979	MU	1.78	02.0N 01.0E 36	NW/NE	1	WELL				x					x
	Vancouver City	Cert	8/13/1986	MU	1.11	02.0N 02.0E 27	NW/NW	1	WELL				x					x
	Vancouver City	Cert	9/10/1979	MU	0.89	02.0N 02.0E 18	SW/NE	1	WELL				x					x
	Vancouver City	Cert	4/14/1969	DM	0.16	02.0N 02.0E 14	SE/SE	1	WELL				x					x
	Vancouver City (total GW)				208.61	02.0N 02.0E 07			WELL (multiple)				x					x
	Vancouver-Clark Cnty Dept Of Parks & Rec	Pmt	1/12/1995	DM	0.60	02.0N 01.0E 02		1	WELL				x					
	WA Department Of Natural Resources	Cert	5/1/1972	DM	0.01	02.0N 04.0E 10	SW/SW	1	WELL			x						
	WA Department Of Natural Resources	Cert	11/6/1970	DM	0.01	04.0N 04.0E 34	NW/NE	1	WELL			x						
	WA Department Of Natural Resources (total GW)				0.01	02.0N 04.0E 10			WELL (multiple)			x						
	WA Parks & Recreation Commission	Cert	4/21/1989	DM	0.06	02.0N 06.0E 23	SE/SW	1	WELL			x						
	WA State Parks & Recreation	NewApp	3/6/2002	DM	0.10	02.0N 06.0E 36		1	WELL	x								
	Walertech LLC	NewApp	8/1/1996	IR,DM	1.56	02.0N 03.0E 32		1	WELL	x								
00164	WARREN C C	Cert	1/1/1941	IR,DM	0.12	03.0N 01.0E 32		1	WELL				x					
	Washougal City	Cert	2/3/1981	MU	2.45	01.0N 03.0E 12		1	WELL							x		
	Washougal City	Cert	5/31/1977	MU	0.89	01.0N 04.0E 16		1	WELL							x		
	Washougal City	NewApp	5/6/2004	MU	2.23	01.0N 04.0E 07		1		x								
	Washougal City (total GW)				3.34	01.0N 03.0E 12			WELL (multiple)							x		
	Washougal River Kiwanis Camp Association	NewApp	1/13/1993	DM	0.11	02.0N 05.0E 11		1	WELL	x								
	Washougal School Dist 112-6	NewApp	1/24/2000	DM	0.20	02.0N 05.0E 31		1	WELL	x								
	WHITE FRANKLIN F	Cert	8/22/1980	ST,IR	0.20	03.0N 01.0E 17	SE/SW	1	WELL		x							

**Attachment A-2.
Screening Results for WRIA 28
Inchoate Water Rights Review**

The following is the full list of water rights considered for the screening process for WRIA 26. The water rights are listed in alphabetical order by water rights owner ("Person").										Basis for Screening Out						Proposed Priority for Review		
Cert #	Person	Doc	Priority Dt	Purpose	Qi (cfs)	TRS	QQ/Q	Src's	Source	Application Status (Step 2)	Type of Use (Step 3)	Instantaneous Rate (Step 4 &5)	Location in Priority Subbasin (Step 7)	Within Priority: Not Likely Municipal-type use	Granted Water Rights Reservation	First Tier	Second Tier	Third Tier
	Windsprings Development Co	Cert	11/12/1985	IR,FR	0.45	01.0N 02.0E 02	NE/SE	1	WELL		x							
	WISE JEAN C	Cert	1/12/1977	IR,DM	0.07	03.0N 02.0E 22	N2/NE	1	WELL			x						
06292	WOOD T L	Cert	7/18/1968	IR,DM	0.04	03.0N 01.0E 24	NW/SE	1	WELL			x						
	WOODHOUSE STANLEY H	Cert	11/14/1973	IR,DM	0.09	03.0N 02.0E 25	NW/SW	1	WELL			x						
	YOUNT VIRGINIA	Cert	6/19/1974	ST,IR	0.36	03.0N 02.0E 17	NW/NW	1	WELL		x							

Attachment A-3.
Candidate List of Water Providers Based on
Location (High Priority Subbasins)
WRIAs 27/28 Inchoate Water Rights Review

Number	ID	Owner	Purpose	Rate (cfs)	Source	Comments
1	WA-3	Camas City (total GW)	MU	20.00	WELL (multiple)	Granted a reservation in Watershed Plan
2	EF-4	Clark Cnty PUD (total GW)	MU	4.32	WELL (multiple)	Granted a reservation in Watershed Plan
3	EF-5	Ridgefield City (total GW)	MU	3.73	WELL (multiple)	Granted a reservation in Watershed Plan
4	WA-1	Camas City (total SW)	MU	3.50	BOULDER + Jones CREEK	Granted a reservation in Watershed Plan
5	LC-2	Washougal City (total GW)	MU	3.34	WELL (multiple)	First Tier; municipal right
6	EF-6	LaCenter Town (total GW)	MU	2.67	WELL	First Tier; municipal right
7	EF-7	Clark Cnty	IR,DM	1.34	WELL	Not likely for municipal use
8	LC-3	R & R Joint Venture	DM,CI	1.11	WELL	Not likely for municipal use
9	WA-2	Camp Fire Girls Inc	RE,DM	1.00	UNNAMED SPRING	Not likely for municipal use
10	EF-8	Yacolt Town (total GW)	MU	0.94	WELL (multiple)	First Tier; municipal right
11	EF-9	Clark Public Utilities (total GW)	MU	0.78	WELL (multiple)	Propose for short-list
12	NF-3	USFS (total GW)	DM	0.68	WELL (multiple)	Not likely for municipal use
13	EF-10	Foothills Service Co	DM	0.60	WELL	Second Tier
14	NF-4	HOFFMAN & EDWARDS	DM	0.53	WELL	Second Tier
15	HG-1	Beacon Lake Corporation	IR,DM	0.50	BEACON CR *	Second Tier
16	EF-11	RANDOLPH F ET AL	IR,DM	0.49	WELL	Second Tier
17	EF-12	Pacific Wood Treating Corporation (total GW)	DM,CI	0.46	WELL	Not likely for municipal use
18	NF-5	Lake Mervin Development Co (total GW)	DM	0.39	WELL (multiple)	Second Tier
19	EF-13	Woodside Merry	DM	0.36	WELL	Second Tier
20	HG-4	Skamania Landing Owners Association (total GW)	DM	0.33	WELL	Second Tier
21	EF-14	Parkside Development Inc (total GW)	DM	0.32	WELL	Second Tier
22	LC-4	BUHMAN W (total GW)	DM	0.29	WELL	Second Tier
23	WA-7	ENGLEMAN C L (total GW)	DM	0.27	WELL	Second Tier
24	EF-15	WA Corrections Dept	DM	0.26	WELL	Not likely for municipal use
25	NF-6	Pacific Corporation	IR,DM	0.25	WELL	Not likely for municipal use
26	LC-5	BRADSHAW & BLAKE	DM	0.23	WELL	Second Tier
27	EF-22	Clark Cnty School Dist 115	IR,DM	0.22	WELL	Not likely for municipal use
28	LC-6	Country Manor Mobile Village Inc	DM	0.22	WELL	Second Tier
29	HG-2	Skamania Cnty School Dist 2 (total SW)	IR,DM	0.22	KATZMER SPR + other tribs	Not likely for municipal use
30	LC-7	SLOSAR JOE ET UX (total GW)	DM	0.22	WELL	Second Tier
31	EF-16	Ridgefield School Dist 122 (total GW)	IR,DM	0.21	WELL (multiple)	Not likely for municipal use
32	HG-3	BOWCUTT KENNETH L	DM	0.20	UNNAMED SPRING	Second Tier
33	EF-17	WA Health Department (total GW)	DM	0.18	WELL (multiple)	Second Tier
34	EF-1	STOUT JAMES C	FR,DM	0.16	RILEY CREEK	Second Tier
35	LC-8	HUENNEKENS TRAVIS	IR,DM	0.16	WELL	Second Tier
36	EF-18	WA Parks & Recreation Commission (total GW)	DM	0.15	WELL (multiple)	Not likely for municipal use
37	EF-19	ENO P E ET AL	IR,DM	0.13	WELL	Second Tier
38	EF-20	BALINT CHARLOTTE E	IR,DM	0.13	WELL	Second Tier
39	LC-9	Prairie Recreation Field Inc	IR,DM	0.13	WELL	Not likely for municipal use
40	WA-13	Green & Carl Construction	DM	0.13	WELL	Not likely for municipal use
41	LC-10	Livingston Mountain Homeowners Assn Inc (total GW)	DM	0.13	WELL	Second Tier
42	LC-11	MCBAIN * HOCKINSON	DM	0.13	WELL	Second Tier
43	LC-12	BARNARD WILMA ET AL	ST,DM	0.12	WELL	Second Tier
44	WA-16	COLE H ROBERT ET UX	DM	0.12	WELL	Second Tier
45	EF-21	NORRIS JEROME ET UX	IR,DM	0.11	WELL	Second Tier
46	LC-13	Prairie Community Church Inc	IR,DM	0.11	WELL	Not likely for municipal use
47	LC-14	COONROD & MODRELL	IR,DM	0.11	WELL	Second Tier
48	NF-7	MOLL L H	HE,DM	0.11	WELL	Second Tier
49	EF-2	FALK I R	ST,DM	0.11	UNNAMED STREAM	Second Tier
50	NF-8	WA Department Of Fish & Wildlife (total GW)	DM	0.11	WELL (multiple)	Second Tier

Attachment A-4.
Group A Water Systems Provided by Department of Health

Public Water System Name	Inactive	Connections	Approved Connections
WRIA 27			
Woodland, City Of		1981	Unspecified
Kalama, City Of		1515	Unspecified
Lake Merwin Campers Hideaway Sys 1		1067	1067
Ridgefield Public Works Ws		1202	Unspecified
Yacolt Water System		498	Unspecified
Lake Merwin Campers Hideaway Sys 2		311	366
Lake Merwin Campers Hideaway Sys 3		143	144
Lewis River Rv Park		107	1
Cougar Crest Ws		90	
Woodland Mobile Home Park		78	
Amboy Clark Public Utilities		64	
Swift Creek Estates A Wa N P Ws		47	
Cowlitz Valley Wildlife League		46	
Lewisville Park Ws		36	
Beaver Bay Campground Ws		35	
Kings Lakeside Mutual Park Ws		34	
Mahaffey Rv Park Ws		33	
Cougar Park And Campground Ws		27	
Four Peaks		24	
Cougar Rv Park And Campground		23	
Merry Etta Park Water System		22	
Swift Campground Pp And L Co Ws		21	
Yale Village / Saddle Dam Park Ws		20	
Mt St Helens National Volcanic Monu		19	
Merwin Village/Park Ppl Co Ws		17	
Paradise Point State Park		17	
Pine Creek Wc		16	
Willard National Fish Hatchery		15	
Larch Corrections Center Ws		15	
Lewis River Golf Course Ws		14	
Peterson Farms Ws		12	
Little White Salmon Natl Fish Hatc		8	
Yale Park Water System		7	
Annes Berry Farm Water System		5	
Pomeroy Plowman Ranch Ltd Ws		5	
Tsugawa Farms 1 Ws		5	
Royal Ridges Retreat Ws		4	
Cedar Creek Sda Church Ws		3	
Yale Elementary School Ws		3	
Woodland Winter Race Track		3	
Lucia Falls Park Ws		3	
Jacks Restaurant & Store Ws		2	
Daybreak Park Ws		2	
Haapa Boat Launch		2	
Fargher Lake Grocery Ws		2	
Royal Ridges Water System		2	
Amboy Sda Church		1	
Fargher Lake Inn		1	
Paradise Quick Stop		1	
Woodland Foursquare Church		1	
Northwestern Park Ws		1	

Attachment A-4.
Group A Water Systems Provided by Department of Health

Public Water System Name	Inactive	Connections	Approved Connections
Lower Falls Cg Upper Lp		1	
Lower Falls Cg Lower Lp		1	
Chelatchie Prairie General Store Ws		1	
Walts Meats Water System		1	
Cherry Grove Friends		1	
Meta Lake Int Site		1	
WRIA 28			
Camas Municipal Water Sewer System		6752	Unspecified
Vancouver, City Of Water System		66232	Unspecified
Clark Public Utilities Ws		28402	Unspecified
Washougal, City Of		4445	Unspecified
Battle Ground Water Dept, City Of		3950	Unspecified
North Bonneville, City Of		367	461
Vista Del Rio Mobile Home Park		208	217
Country Manor Mobile Home Park		160	160
Golden West Mobile Manor Ws		145	157
Washougal Timber Trails Ws		127	127
Great Western Mobile Home Park		120	120
Home Valley Water District Ws		123	206
Wauna Lake		98	
Mill A Water Co Water System		81	
Oak Meadows Mobile Home Park		71	
Skamania Landing Owners Assn Ws		54	
Green Mountain Mobile Ranch Ws		53	
Camp Arrowhead		51	
Beacon Rock Trailer And Rv Park Inc		50	
Vanridge Mobile Home Park		41	
Hillcrest Mobile Manor		33	
Port Of Vancouver Ws		29	
Brookside		27	
Parkside Airpark Owners Ws		27	
Morning Meadows		25	
Andersen Dairy Inc Water System		25	
Battle Ground State Park		23	
Single Tree Acres		23	
Beacon Rock State Park 1		22	
Tukes Mountain Homeowners Ws		19	
Kadows Marina Water System		18	
Magna Vista Water Corp Ws		18	
Cascade Estates Satellite		17	
Regency Place Water System		17	
Salmon Falls Bible Camp		10	
Vancouver Lake Park Ws		6	
Clark County Saddle Club Ws		5	
Brush Prairie Baptist Church		4	
Camp Melacoma- Nieman Lodge		4	
Alderbrook Park Water System		4	
Harmony Sports Ws		4	
Fourth Plain Church Of The Nazarene		3	
Green Meadows Ws		3	
Califf, Matthew Water System		3	
Green Mountain School Ws		3	

Attachment A-4.
Group A Water Systems Provided by Department of Health

Public Water System Name	Inactive	Connections	Approved Connections
Washougal Motocross Llc Ws		3	
Skamania General Store Inc Ws		3	
Mount Pleasant Elementary Ws		3	
Lacamas Conference Center Ws		3	
Camp Melacoma - Pool House		3	
Fern Prairie Mkt Inc Water System		2	
Pleasant View Church & The Nazarene		2	
Columbia Rock And Aggregates Inc		2	
Bonneville Dam Power House 2		2	
Beacon Rock State Park Gp Cg		2	
Riverside Grocery And Cafe Inc Ws		2	
Joes Place Farms Water Systems		2	
Frenchmans Bar		2	
Camp Wa Ri Ki Ws		2	
Battle Ground High And Lewisville E		2	
Cape Horn Skye Grade School Ws		1	
Prindle County Park Ws		1	
Sacred Heart Catholic Church		1	
Glenwood Little League Ws		1	
Evergreen Little League Ws		1	
Creekside Country Market Ws		1	
Lds Church Ne 18th Street Clark Pud		1	
West Van Material Recovery Center		1	
Skamania Elementary School Ws		1	

Appendix D
Salmon-Washougal and Lewis Watersheds
Integrated Mitigation Guidelines

Appendix D Integrated Strategy for Implementing Water-Rights Reservations¹

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Attachments

¹ HDR, 2/11/08

- A. White Paper: Reserved Water Strategy Implementation, WRIA 25/26
- B. White Paper: Reserved Water Strategy Implementation, WRIA 27/28
- C. Evaluation of Flow-Related Mitigation
- D. How to Evaluate Habitat/Watershed Mitigation
- E. Example of Flow-Related Mitigation
- F. Cost Considerations Background and Options Considered

1.0 Background and Purpose

This Report summarizes work completed by a Water Rights Mitigation Subcommittee representing two Watershed Planning Units in southwestern Washington State: the Watershed Planning Unit for the Grays Elochoman and Cowlitz River Basins (WRIAs 25-26); and the Watershed Planning Unit for the Salmon-Washougal and Lewis River Basins (WRIAs 27-28)². The Subcommittee was formed to develop procedures for implementing policies on accessing water rights reservations within these four WRIA's, including an approach to proposed mitigation actions by water rights applicants. This activity is one element of implementation of the two Watershed Management Plans developed for these WRIAs.

This work has been performed under the provisions of Chapter 90.82 RCW; and was funded through grants from the Washington State Department of Ecology. Management of the grant funds and oversight of the project consultant has been performed by the Lower Columbia Fish Recovery Board (LCFRB).

The watershed plans for the two planning areas were prepared by the two planning units and adopted in 2006. Both plans include policies intended to balance the needs of water for growth and development with those of instream flow supporting aquatic life and multiple beneficial uses. The plans recommend that the Washington State Department of Ecology "close" many of the surface waters in these WRIAs to further appropriations. This means that new water rights would not be issued. However, the plans also recommend that the State Rule enacting these closures include "reservations" of water for certain uses. The reservations were carefully defined to minimize further impacts on stream flow from new water uses. Generally the reservations represent flow volumes of approximately one to two percent of existing flows in specific streams during the low-flow season. The intent of the combined closures and reservations was to protect instream flows while providing limited access to new water supplies.

The reservations represent flow volumes of approximately one to two percent of flow in specific streams during the low-flow season.

Attachments A and B to this Report provide policy statements from both Watershed Management Plans regarding water reservations, as well as tables listing the specific quantities reserved, by stream and by user.

The Watershed Planning Units anticipate that most new applications for water rights under the reservations will be for ground water rather than surface water. The reservations are identified in terms of stream flow depletion, rather than the quantity of water used. A larger quantity may be pumped, as long as the stream flow depletion is not exceeded. The Mitigation Subcommittee did not examine methods for quantifying effects of pumping on stream flow. This is because the Department of Ecology already has considerable experience in this regard, and the Subcommittee preferred to focus its work on the new procedures required to implement the Watershed Plans.

² WRIA stands for Water Resource Inventory Area

The reservations are set aside for municipal water systems, domestic wells and certain other types of users. Table 1 summarizes categories of users with access to the reserved waters. For full information, including specific reservations by stream, see Attachments A and B.

Table 1
Categories of Water Users with Access to Reserved Waters¹
(WRIAs 25/26 and 27/28)

Cities and Towns (identified individually)
Public Utility Districts (identified individually)
Small Community Water Systems
Domestic Wells
Commercial Uses
Other Beneficial Uses

1. Not all user groups have access in all areas. For specific reservations assigned to each group, see Attachments A and B.

The policies in the Watershed Management Plans place stringent conditions on accessing the reserved waters. These include:

- A water right applicant must first review alternative sources of supply that would not deplete stream flow in a closed reach (or would reduce depletions compared with the proposed source of supply);
- The applicant's proposal to withdraw water must include off-setting and mitigating actions;
- Flow depletion must be mitigated to the maximum extent practicable using flow-related actions. No less than half of the stream flow depletion must be offset through flow-related mitigation (with some exceptions); and
- Other mitigating actions, such as habitat improvements, must be carried out to mitigate for flows not offset through flow-related actions.

At the same time, the Watershed Management Plans recognize that imposition of overly restrictive requirements could undermine the plans' policies on provision of new water supply. Therefore the plans recognize that both cost and logistical barriers are valid considerations in evaluating the adequacy of mitigation actions.

Following adoption of the Watershed Plans in 2006 the Planning Units entered Phase 4 of the watershed planning process. Phase 4 addresses implementation of the Watershed Management Plans. As one step in developing a detailed implementation plan, the two planning units formed a joint subcommittee to develop more detailed procedures for implementing the reservations and determining how mitigation proposals should be evaluated. The intent has been to provide specific guidance to the Department of Ecology for processing water rights applications for reserved waters and that the mitigation procedures will be practical, predictable, and transparent for water rights applicants.

Mitigation procedures should be practical, predictable and transparent.

This Report presents the findings and recommendations of the Water Rights Mitigation Subcommittee. In some areas the Subcommittee has developed recommendations that are nearly complete. In other areas, work remains to be done. The report is organized as follows:

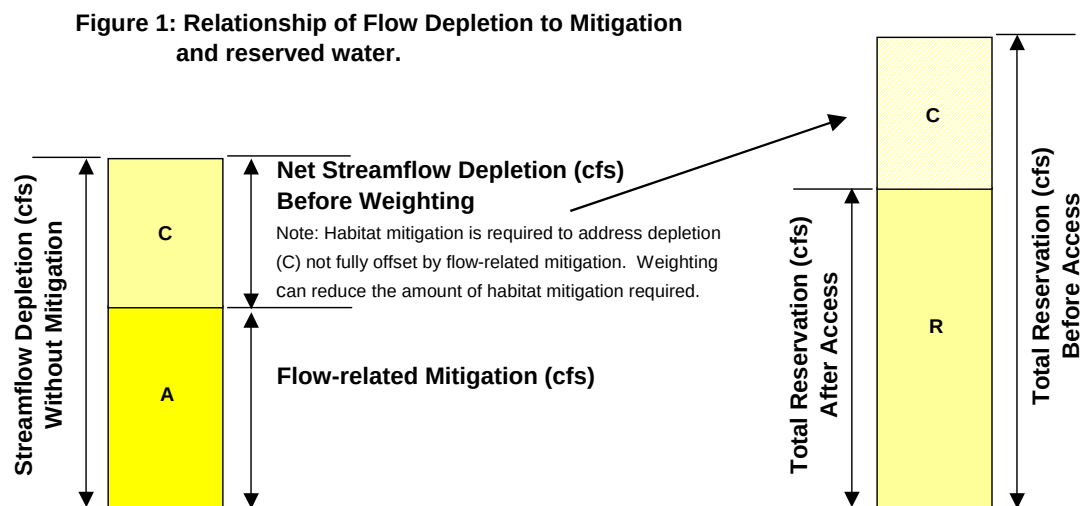
- 1.0 Background and Purpose
- 2.0 Reservation Accounting
- 3.0 Preliminary Steps for Water Right Applications
- 4.0 Mitigation Actions
- 5.0 Monitoring and Maintenance of Mitigation Actions
- 6.0 Cost Considerations
- 7.0 Small Systems
- 8.0 Mitigation Banking
- 9.0 Application and Scoring Procedures
- 10.0 Items Requiring Further Development

These sections primarily summarize the elements of the reservation program and mitigation strategy. Details of each element are contained in the attachments to this Report.

2.0 Reservation Accounting

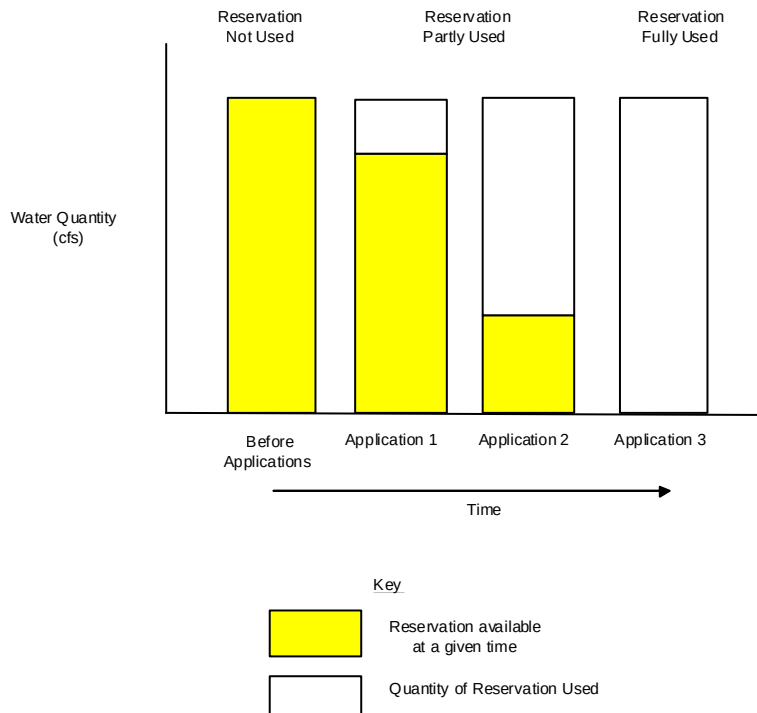
The Watershed Management Plans established the closure amounts by stream and by eligible applicants, but did not provide a detailed discussion of how the reservations would be tracked and managed over time as new water rights are issued to specific users. The Subcommittee has developed more detailed guidance on this topic.

Water reservation accounting principles are based on the guidance outlined in Section 3.3.1 and Appendices I (WRIA 25/26) and H (WRIA 27/28) of the Plans. The specific procedures used for determining mitigation “credits” and “debits” are described in Section 4 of this report. The fundamental relationships between mitigation actions, flow depletion, “credits” and “debits”, and reservation accounting are shown in Figure 1. These relationships will provide the basis for development and management of a water reservation accounting system.



A given reservation may be used up all in a single water-right application; or may be gradually “drawn down” over time. Figure 2 depicts a reservation that is gradually drawn down, by three water right applications over a period of several years.

Figure 2. Use of Reservation Over Time



The primary approach for mitigating streamflow depletion impacts is through flow-related actions. If streamflow depletion is fully mitigated through flow-related actions, the reservation would not be debited and would remain available for future access. However, if impacts are only partially offset through flow-related actions (Figure 1, Segment A), the remaining streamflow depletion (Figure 1, Segment C) is “debited” from the reserve.

As depicted in Segment C, habitat/watershed mitigation actions will also be required to offset net streamflow depletion impacts, but will not be used to reduce the amount of “debit” from the reservation.

Additional instream flow benefits that result in “up-weighting” of the flow-related mitigation credits under the procedures outlined in Section 4 can be used to reduce the amount of habitat mitigation required to address net stream flow depletion as represented by Segment C. The type, scope and scale of habitat mitigation will be determined using the guidance outlined in Section 4 of this document. Attachment E contains a spreadsheet tool that helps to illustrate how weighting of flow-related mitigation actions may reduce the amount of habitat mitigation required.

Successful implementation of the reserved water strategy will require that the Department of Ecology, as the primary regulatory entity, develop a management and accounting system to track

the status of water reservations and related data. To be functional for applicants and decision-makers, this system should be web-accessible. The Planning Units recommend that the following general elements be included in this system:

- Reservation amount (original and current)
- Complete history of reservation debits and credits by stream
- Complete history of reservation debits and credits by entity
- Project application information:
 - ◆ Entity
 - ◆ Type (flow, habitat)
 - ◆ Status (approved, denied, pending)
 - ◆ Description, goals and objectives
 - ◆ Location(s) (legal description, subbasin, reach, etc)
 - ◆ Project metrics
 - ◆ Plans and specifications
 - ◆ Debit and credit calculations
 - ◆ Permit conditions, restrictions
 - ◆ Monitoring
 - ◆ Operation and maintenance requirements
 - ◆ Relationship to other projects
 - ◆ Agreements
- Related flow monitoring data and information, if required
- Number of domestic wells, installed under the reservation policy, compared with number planned at time the reservation was established.³
- Banking metrics (to be determined)
- Web-linkages to related plans, guidance documents, and other information sources

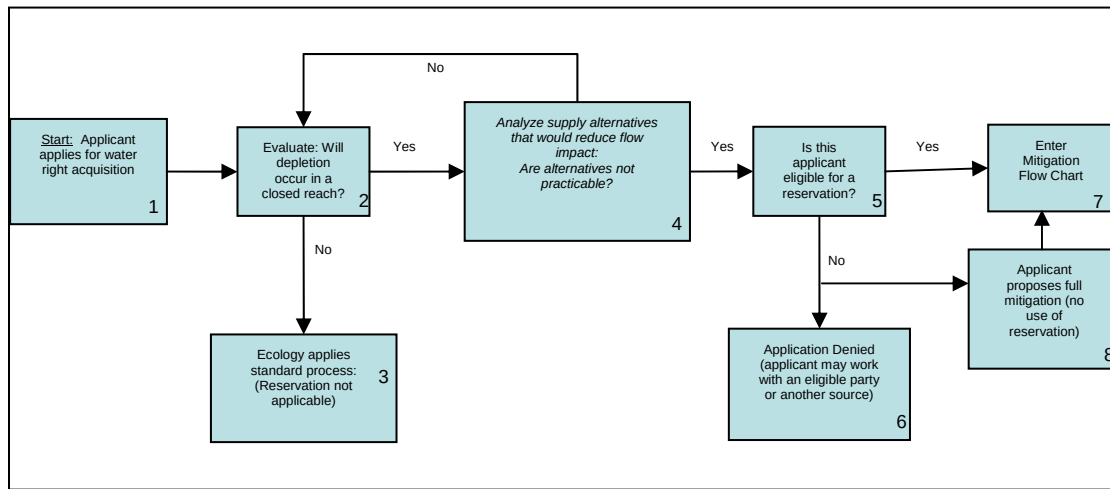
The Planning Units recommend that the details of a water reservation management and accounting system be determined further as part of continued activity during the Phase 4 Implementation period. The Department of Ecology should coordinate closely with the Planning Units, purveyors, resource agencies, LCFRB, and other implementation partners during development of this system.

3.0 Preliminary Steps for Water Right Applications

Figure 3 shows preliminary steps to determine whether a water rights applicant can apply for reserved waters, and whether a mitigation proposal is required.

³ The quantity of water reserved for domestic wells was generally selected based on “predicted land use over a 20-year time horizon” (see Appendix I of WRIA 25/26 Plan and Appendix H of WRIA 27/28 Plan).

Figure 3. Pre-Screening Procedure for Reserved Water



- Flow depletion estimates on a stream will be quantified based on standard methods currently accepted by Ecology (cost to applicant is a separate discussion)
- For surface water applications, there will be a well-defined point of diversion on a surface water body. For ground water applications, a discrete “point of impact” on an affected water body will need to be defined, to enable the steps discussed below.

4.0 Mitigation Actions

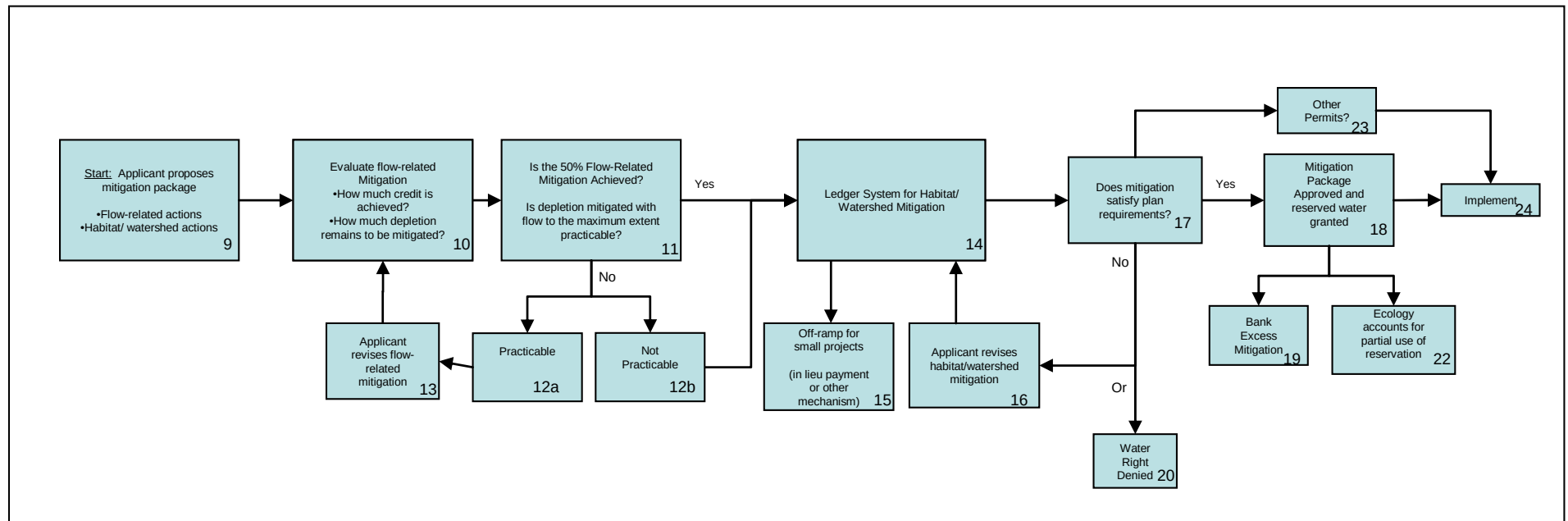
Under the policies presented in the Watershed Management Plans, applications for reserved waters must be accompanied by offsetting and mitigating actions. The Subcommittee understands that these actions will normally be expressed as conditions associated with a water right issued by the Department of Ecology. The Subcommittee understands that “offsetting” actions are essentially flow-related mitigation actions that replace water in the stream. Other mitigating actions may include a wide variety of actions that either help moderate streamflow impacts or provide other benefits to aquatic resources and aquatic habitat. Collectively, all of these offsetting and mitigating actions are referred to as “mitigation” in this report and attachments.

The procedures recommended by the Subcommittee break mitigation down into two main categories:

- Flow-related mitigation; and
- Habitat/watershed mitigation.

These two categories are handled somewhat differently because the plan emphasizes flow-related mitigation actions over other actions. Figure 4 displays the process for an applicant’s mitigation proposal to be evaluated.

Figure 4. Mitigation Evaluation for Reserved Water



Mitigation ordinarily must occur within the same LCFRB-defined subbasin (or for the larger river systems, a subbasin that is hydrologically part of the same larger basin). Limited exceptions may be permissible, where greater benefits can be demonstrated through mitigation in another subbasin.

Key steps in the process occur in Box 10 (Evaluate Flow-Related Mitigation) and Box 14 (Ledger System for Habitat/Watershed Mitigation). The evaluation process that occurs within these two boxes is elaborated further in Attachments C and D.

In brief, these two evaluations are conducted as follows:

4.1 Box 10: Evaluation of Flow-Related Mitigation

Flow-related mitigation actions may include a range of actions that directly replace flow depleted by a new water withdrawal or diversion. Actions that may be proposed in this category could include:

- Acquisition of out-of-stream water rights to be dedicated for instream flows;
- Salvaged water obtained through conservation actions not mandated by law, that result in increased stream flows (e.g. conservation on irrigated farmland);
- Pumping of ground water with direct or indirect discharge to a stream at a time and manner to provide net increase in flow;
- Modification of wastewater systems to permit increased discharge of treated effluent to a stream, meeting suitable water quality requirements; and
- Other projects that directly enhance stream flow.

The following basic assumptions apply to flow-related mitigation:

- Flow depletion estimates on a stream will be quantified based on standard methods currently accepted by Ecology;
- For surface water applications, there will be a well-defined “point of diversion” on a surface water body. For ground water applications, a discrete “point of impact” on an affected water body will need to be defined, to enable the steps discussed below. In cases involving more than one pumping or withdrawal location, or variable stream flow capture along a gradient, multiple points of diversion or impact will be established;
- The 50% requirement for flow-related mitigation must be accomplished at the defined point(s) of impact or diversion. For this test, the quantity of flow will be the only metric. However, seasonality will be considered; and
- The required 50% flow-related mitigation may be provided in a location other than at the defined point(s) of diversion or impact provided the applicant demonstrates that overall greater resource benefits would result. In these limited exceptions, a quantitative analysis similar to that described in Appendix E must demonstrate overall greater resource benefits as measured by distance (e.g., miles) of watercourse

affected, quantity of flow (cfs) benefit and impact relative to baseline habitat conditions, water quality and salmon recovery reach tiering, in both the impacted and benefiting reaches.

A determination will be made as to whether the flow-related mitigation proposed has similar attributes to the water depleted, or significant differences. This step will compare the depleted water body and the water body identified for mitigation, using attributes such as length of stream affected; physical relationship (mainstem/tributary); seasonality of effects; water quality; and importance to listed species.

If there are significant differences between the depletion effect and the mitigation action, then a “weighting” process will be performed on the mitigation action. The weighting process determines how much “credit” will be awarded for the flow-related mitigation action, in comparison with the flow depletion (see Attachments C and E).

Based on the results of this weighting process, a determination will be made as to whether the flow depletion is fully offset; partially offset; or more than offset. The results will be used to determine:

- whether further mitigation is required using habitat/watershed mitigation actions; and
- whether excess mitigation credit is awarded that can be banked for the future (see Section 7).

Further details on evaluation of flow-related mitigation actions are presented in Attachment C. Attachment E contains an example of scoring of flow-related mitigation, including a spreadsheet tool to assist with the weighting and scoring procedure.

4.2 Box 14: Evaluation of Habitat/Watershed Mitigation

After the applicant’s flow-related mitigation actions have been evaluated, further actions may still be needed to mitigate the remaining flow depletion. Evaluation of habitat/watershed mitigation actions is more challenging, because these actions do not directly offset stream flow and results are much harder to quantify. Furthermore, it is expected that habitat/watershed mitigation actions will be highly diverse from one application to another.

The Subcommittee devoted considerable attention to developing a scoring system that could accommodate a wide array of habitat/watershed mitigation actions. The initial basis for a scoring system of this nature was review of similar procedures developed by other agencies. For example consulting staff reviewed and summarized the Regional General Permit impact and mitigation point system used by the U.S. Army Corps of Engineers for dredge and fill projects under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Consulting staff also reviewed the Ohio Environmental Protection Agency guidance for Section 401 certification; and the procedures used by the Deschutes River (Oregon) Groundwater Mitigation Bank. Features that seemed most applicable to the mitigation program for WRIAs 25/26 and 27/28 were based primarily on the Corps of Engineers example.

The Subcommittee recommends use of a “ledger system” for scoring proposed mitigation actions. On the “debit” side of the ledger is the remaining stream flow depletion that was not mitigated through flow-related. The debit is scored based on four factors:

- Quantity of remaining flow depletion measured in cubic feet per second (cfs);
- Length of stream affected by the flow depletion, measured in tenths of a mile (0.1 mi.);
- Whether instream flow is considered limiting to fish production at the reach-scale relative to other habitat factors; and
- Importance of the affected stream reaches as fish habitat (based on reach tiers from the LCFRB Habitat Work Schedule).

A matrix was developed to enable any stream depletion to be “scored” using these four factors. This debit score then becomes the basis for comparison of habitat/watershed mitigation actions for a given water right application.

On the “credit” side of the ledger, the applicant’s habitat/watershed mitigation actions are also scored. The Subcommittee identified five standard categories of habitat/watershed mitigation that are expected to be encountered most frequently. For each of these five categories, a simple scoring system was developed. The value of mitigation within each category is generally defined by 1) the importance of the mitigation reach to fish recovery, and 2) the specific kind of mitigation action proposed. The value of mitigation between each category and flow depletion was determined using different rationale and methods.

Table 2 lists the five standard categories of habitat/watershed mitigation. Further details are provided in Attachment D.

In the ledger system process, the points on the “credit” side are compared with points on the “debit” side to determine how fully the applicant’s proposal mitigates for the remaining stream depletion.

As indicated in Section 2 (Reservation Accounting), scoring of habitat/watershed mitigation does not affect the quantity of water deducted from the applicant’s reservation. Instead, it is used to determine whether the applicant has fully met the mitigation requirements of the Watershed Management Plans.

It should also be noted that fully mitigating the remaining flow depletion (after accounting for flow-related mitigation) may not be required in all cases. For further information, see Section 5 (Cost Considerations).

Table 2
Rationale for Scoring Different Types of Habitat/Watershed Mitigation Actions

	Mitigation Actions	Rationale	Processes and Functions Associated with Mitigation Actions	Mitigates Reduction in Aquatic Habitat	Mitigates Hydrologic Impacts	Method for Determining Value Relative to Flow Reduction
1	Side Channel/ Off-Channel Habitat Restoration (per acre)	Increase the quantity of aquatic habitat	Refugia; spawning habitat; invertebrate production; over-wintering habitat	X		IFIM modeled relationship between streamflow and WUA
2	In-Channel Improvements (per 100 sq. ft)	Increase utilization of "downstream" aquatic habitat by increasing habitat quality	Refugia; wood and gravel recruitment; sediment sorting; bedform diversity; bed material retention	X		IFIM modeled relationship between streamflow and WUA
3	Wetland Restoration (per acre)	Some wetlands can attenuate transport of upslope stormwater to streams; store water from high-flow events; and / or contribute to baseflows	Maintenance of stream low-flow ; Attenuation of stormwater impacts; wetland water quality function; wetland habitat function		X	Best Professional Judgment
4	Floodplain Reconnection (per acre)	Levee removal or setback allows for increased utilization of floodplain and increased water storage for low flow maintenance	Channel stability; sediment sorting; floodplain connectivity /storage; bedform diversity; hydraulic diversity; nutrient input; refugia		X	Best Professional Judgment
5	Riparian Preservation and Restoration (per acre)	Riparian vegetation attenuates transport of water from watershed to channel and improves habitat conditions in WUA	Shading; Bank stability; width/ depth; pollutant filtering; flow retention; erosion control; LWD input; refugia; channel roughness; allochthonous material input; floodplain roughness		X	Best Professional Judgment
6	Other Mitigation Actions	Applicants may propose other types of habitat / watershed mitigation. Those proposals will be evaluated on a case-by-case basis	Variable	Variable	Variable	Best Professional Judgment

Some additional elements of the mitigation procedure are listed below. For further requirements, see Attachment D.

- The mitigation actions must be for actions that are not already mandated to occur (e.g. culverts, critical areas protection, etc.);
- Mitigation should occur in the same sub-basin as the flow depletion. Mitigation may be completed in another sub-basin if the applicant can demonstrate a greater resource benefit;
- Mitigation projects and actions should be developed and implemented using best available science and have a high long-term likelihood of success. Specific performance goals and measures (e.g. success rates, temporal, desired future conditions, etc.) will be associated with each mitigation action and mutually agreed upon by the applicant and Ecology; and
- In cases where multiple parties contribute to a project, the water right applicant only receives credit proportional to their contribution.

5.0 Monitoring and Maintenance of Mitigation Actions

Where mitigation actions depart from simply acquiring offsetting water rights, they may need to involve monitoring and/or maintenance components. This is important because some mitigation actions may not perform as planned; may deteriorate over time; or may be affected by floods or other changes in watershed conditions. The Planning Units intend that flow-related mitigation accompanying the issuance of reserved waters be effective throughout the “lifetime” of the authorized water use.

The Mitigation Subcommittee discussed different concepts for how long-term monitoring and maintenance needs of habitat mitigation actions could be addressed. The Subcommittee recommends that the applicant be responsible for monitoring and maintenance for only a fixed period of time (e.g. three years; ten years). The intent is to ensure that the mitigation action is successful as initially conceived, but not to require an open-ended obligation to maintain it permanently. Performance standards should be developed for different types of mitigation actions, similar to those used in comparable local, state and federal programs. At the same time, where an action has uncertain effects over the long-term, this should be reflected in the mitigation scoring procedure.

6.0 Cost Considerations

The policy on water right reservations in the Watershed Management Plans for WRIAs 25/26 and 27/28 indicates that cost should be a valid consideration in evaluating the adequacy of mitigation proposals (Attachments A and B). There are several steps where cost considerations may apply:

- In determining whether water supply alternatives are available that would avoid depletion of a closed stream;

- In determining whether an applicant can mitigate more than 50% of stream flow depletion using actions that are not flow-related;
- In determining whether flow-related actions will be used “to the maximum extent practicable;” and
- Where habitat/watershed mitigation is proposed to supplement the required flow-related mitigation, determining whether the habitat/watershed mitigation actions meet the mitigation program requirements.

The intent of using cost as a consideration is to prevent situations where water users having a designated reservation cannot reasonably access the reservation because mitigation requirements are too burdensome. The reservations were set aside with the understanding that water users may need to deplete stream flow, within limits, as new supplies are needed. The barriers to accessing this supply should not be so high that it makes the reservations unavailable in practical terms.

However, the reservation was not intended as a “free pass” either. A balance must be struck so that at least a minimum level of mitigation will be achieved. Therefore in cases where mitigation costs exceed the defined threshold, this does not mean that mitigation will not be done. Instead, it should drive the applicant to consider other mitigation alternatives. Even if no suitable alternatives can be found, the applicant would need to mitigate up to the cost threshold.

The Mitigation Subcommittee has defined cost considerations in greater detail, in order to make this element of the reservation program operational for actual decisions on water right reservations and associated mitigation actions. This included consideration of four alternative approaches.

6.1 Principles

The following principles were used in comparing alternative approaches to cost considerations:

- Cost considerations should support mitigation objectives of the plan; yet should not prevent access to reservations by designated users;
- Methods of defining cost considerations should be based on standard economic practices in the water resources field and should reflect both immediate and long-term economic factors;
- Cost considerations should be simple in application. Cost thresholds should be easy to define for a specific water right application and should not require extensive research or analysis by the applicant or Ecology; and
- The approach should yield consistent outcomes from project to project and among different applicants.

6.2 Approaches Considered

Several methods were considered for defining a cost threshold for the reservation program. These include:

1. Percentage of total cost for a water development project;
2. Market value of equivalent water rights (as a surrogate to assess the value of water to municipal users);
3. Economic value of water for in-stream purposes; and
4. Representative costs of similar mitigation actions.

The Subcommittee reviewed a discussion paper prepared by the consultant staff comparing these four alternatives. Information from the discussion paper is included in Attachment F.

(Note: the alternatives presented focus on cost considerations for evaluating mitigation actions. They do not necessarily apply to evaluating water supply alternatives.)

6.3 Recommended Approach

Based on review of these four approaches, the Subcommittee recommends that a representative market value of water rights be defined for the WRIA 25 – 28 planning area (Approach #2). This value will serve as ceiling on “reasonable cost” in order for communities to gain access to their designated water reservations. It should be noted that this is not a limitation on water rights pricing. Instead, it uses data from actual water rights sales for equivalent water rights as a surrogate for the value of water to municipal water systems.

Water rights are routinely bought and sold, or leased, in the State of Washington, other areas of the Pacific Northwest, and throughout the western states. Considerable data has been accumulated on the range of prices paid by municipal water suppliers for water rights. These prices are independent of project infrastructure needs for water projects, and reflect a cost solely to obtain access to a water resource.

Conceptually, use of comparable costs for water rights appears to provide an appropriate basis for comparison with mitigation costs, because mitigation costs also represent a cost to obtain access to the reserved water resource. As long as comparable transactions are used as the basis, prices paid for water rights represent the “willingness-to-pay” of municipal water systems, and thus should yield a threshold that is not excessively burdensome.

Under this approach, it is proposed that a standard unit value of water be estimated, through review of actual water rights transactions for comparable supplies (i.e. supplies purchased for municipal supply purposes). The cost would need to be adjusted periodically, reflecting changes in market conditions and willingness-to-pay. If mitigation costs per unit do not exceed this value, then the cost of mitigation would be considered “reasonable.”

Of the approaches considered, this one matches best with the Principles defined above. This approach is recommended because it best combines attributes of practicality and consistency with the intent of the cost threshold in the mitigation program. If a “standard” value for access to water is defined, this approach can be relatively simple to apply to individual applications, and would also yield consistent results from user to user. The primary challenge is defining the standard value and the means of adjusting it periodically. Most water users should find this approach easy to understand.

If carefully applied, this method should prevent municipal water suppliers from being required to spend more on mitigation than it is worth to them and their customers. At the same time, it appears a cost level can be determined that will deter applications for reserved water supplies except where there is a strong need for the supply; and that will encourage substantial levels of mitigation are performed.

The primary challenge is that prices for water rights vary considerably from place to place based on local market conditions; and depending on the specific characteristics of each water right. This approach will require developing a standard cost suitable for use in evaluating the adequacy of mitigation proposals in WRIAs 25/26 and 27/28.

Further analysis is needed to determine what costs would actually be for representative stream flow depletions expected in the water rights reservation context; and to assess how this cost framework would affect the level of mitigation to be required. The Subcommittee recommends that further development of this concept include consideration of whether different values should be used in the four individual WRIAs, or a single value to be applied across all four WRIAs.

6.4 Unresolved Questions

Several practical questions may still need to be resolved in order to apply this approach to cost considerations. These questions include:

- Should the standard value be defined as a range instead of a fixed value? One problem with a fixed value is it may inadvertently establish the “floor” for water rights prices in the region. Using a range of values may give water suppliers more bargaining power in cases where they purchase water rights for mitigation purposes. On the other hand, use of a range of values may make this approach more difficult to use in actual water right decisions. The applicant and Ecology may not agree where in the range the cost threshold should fall;
- How will establishment of a standard value for access to water supplies affect small public water systems in the region (e.g. those with fewer than 500 customers)?;
- In comparing mitigation costs to a cost threshold, should only up-front capital costs be considered? Or should long-term operations and maintenance costs be included (and perhaps discounted using standard costing methods)? If O&M costs are included this will better reflect actual costs to the supplier; but may result in less mitigation being required; and

- How frequently should the standard unit value of access to water be adjusted to reflect changing market conditions and willingness-to-pay?

(Note: options will also need to be identified regarding cost considerations for water supply alternatives. In the overall process of applying for use of the reservation, an alternatives analysis precedes the assessment of mitigation needs.)

7.0 Small Systems

The Watershed Planning Units in both WRIAs 25/26 and 27/28 recognize that the mitigation procedures outlined in this report may pose a substantial challenge for small water systems needing access to their reserved waters. The Planning Units intend that an “off-ramp” be provided for small systems, involving an alternate means of satisfying the overall goals of the Watershed Management Plans. For example, this may involve developing a process in which a payment can be made to a mitigation fund for the WRIA, rather than preparing a specific mitigation plan. This would enable funds from a number of small systems to be “pooled.” In addition to making the procedure more simple for small systems, this offers the potential advantage of enabling larger and more valuable mitigation projects to be performed, instead of many small projects scattered throughout the watersheds.

At this time, development of separate procedures for small systems remains to be performed. LCFRB has secured additional grant funding from Ecology that will be used, in part, for this purpose. The overall mitigation program should not be considered complete until this element has been developed.

8.0 Mitigation Banking

The Mitigation Subcommittee has had initial discussions regarding possible banking of mitigation credits in the context of accessing reserved water supplies. Banking of mitigation credits is the means by which a party can accumulate and hold credit for habitat restoration work done so that it may be applied in the future or transferred to another party to access their reservation.

The ability to bank habitat restoration credits offers the following possible advantages:

- Parties may undertake habitat restoration actions to meet current and/or anticipated mitigation needs in a manner, time, scope, nature, and cost that are most advantageous to them;
- Parties with limited or no habitat restoration expertise and experience may be able to acquire needed mitigation credits without having to directly identify, design, and undertake restoration work;
- Provides an incentive to undertake earlier, larger, and more effective restoration efforts; and
- Provides the potential to help leverage non-mitigation habitat restoration efforts addressing high priority needs.

There are two elements of banking:

1. ***Accumulating Credit for Future Use:*** A water rights applicant performs mitigation now; to support a water right application in the future. Banking provides a clear procedure for “storing” credit for use in the future.
2. ***Transferring Credit to Another Person:*** In this case a party takes a habitat restoration action to support a water right application by another party. The water rights applicant would compensate the first party for the right to use the habitat restoration credit to its mitigation obligation in part or in full. Banking provides a place to store credit, pending transfer to a water rights applicant.

The second element also provides a place where applicants needing mitigation can find persons who have appropriate habitat restoration credits available to sell. This could involve acquisition of habitat restoration credits from a party who has conducted a habitat restoration action.

A single system for accumulating credit for future use can ultimately meet both aspects listed above. However, the accounting system would be simpler to establish and administer if it is initially set up to support only the first element. Therefore, the Subcommittee recommends that the two elements listed above be implemented in a phased approach. Phase 1 should be implemented immediately upon activation of the Mitigation Strategy described in this report. Phase 2 should be developed in the near future.

Phase 1 - Accumulating Credit for Future Use: For a single entity to accumulate credit for future use, the following information is needed:

- Person or organization carrying out the action (and receiving credit);
- Subbasin where credit is awarded;
- Amount of credit, based on the same scoring system developed for any mitigation proposal used to tap reserved water; and
- Other information as needed (to be determined).

Several questions need to be discussed regarding Phase 1:

Policy question: How will these procedures relate to other systems of mitigation banking?

The Subcommittee anticipates that other procedures for broader applications of mitigation banking (apart from water right reservations) may be developed in the region or state. Banking procedures set up for the narrow purposes of accessing the water right reservations in WRIAs 25-28 should not preclude participation in these broader mitigation banking systems. Moreover if this occurs, credits from other banking systems should be eligible to be used in accessing reserved water supplies, as long as the provisions described in this strategy document are met.

Policy question: Should the scoring or “credit” determination be done:

- At the time the habitat restoration action is proposed and carried out; or
- At a later date, when the water right is awarded.

The Mitigation Subcommittee recommends that credit be determined at the time the habitat restoration action is awarded. This supports the objective of providing a high degree of certainty in the mitigation credit program. However it is noted that some elements of the scoring process may be difficult to carry out until the water source characteristics are defined. This issue should be examined further, when the banking concept is further developed.

Policy question: If a habitat restoration action is in place for several years before the water right application is filed and awarded, should extra credit be allowed? Early habitat restoration efforts would increase the environment and fish benefit without or prior to stream depletion.

Policy question: Who should operate and maintain the banking process? Should an advisory group based in WRIAs 25-28 be used to periodically review and make recommendations to the organization operating the banking system?

Logistical question: What statutory, procedural, administrative or budgetary needs are involved in establishing the banking system?

Logistical question: What happens if credit is accumulated, but the reservation quantity is fully used up before the water right application is filed in the future? This would apply only to reservations that are established for a group of water users, rather than a specific water user. The Mitigation Subcommittee recommends that reserved water supplies be awarded sequentially, based on the date of application, regardless of any banked mitigation credits. However if credits are banked and cannot be used in a given subbasin, it may be possible to use those credits for a water right in another subbasin, but only if it can be demonstrated that mitigation in the other subbasin cannot be accomplished or would offer little value.

Phase 2: Transferring Mitigation Credits

Ultimately it would add value if the banking system could also support trading of credits among parties doing habitat restoration work and water right applicants. The primary challenge this adds to the system is that the agency administering the accounting system will need procedures to validate who actually gets to use the credits, when credits are traded or sold. There may be some liability associated with the system, in case of disputes over who receives mitigation credits. Procedures will be needed to minimize this liability. These procedures could include a certification process for mitigation actions.

The ability to transfer credit from habitat restoration party to a water right applicant will likely require the concurrence of any granting entity engaged in funding the additional work. In instances where an action was funded by a habitat restoration grant, it will also likely require procedures to ensure that the proceeds from such transfers are used to conduct additional restoration work of similar environmental value.

9.0 Application and Scoring Procedures

The scoring procedure for proposed mitigation actions will require considerable effort on the part of both the applicant and the State agencies with responsibility for reviewing water rights and

habitat mitigation actions. The Subcommittee envisions that the procedure for preparing and reviewing the necessary information could be performed as follows:

- An applicant for a new water right should have an opportunity to meet with Ecology and DFW prior to submitting an application, to discuss the proposed water use, mitigation scoring, and mitigation alternatives;
- A questionnaire should be developed to accompany the water right application. The questionnaire should be designed to assemble the information that will be needed in the scoring procedure. Guidance materials should be developed for applicants to support the process. An applicant will then be required to submit the application form/questionnaire in order to trigger the scoring procedure;
- Ecology and DFW will share responsibility for initial scoring of the application, using a standard scoring sheet (most of the scoring items will be specifically assigned either to Ecology or to DFW; some items may truly be done jointly). In doing so, they may request additional information from the applicant;
- Results will be provided back to the applicant; and the applicant should have an opportunity to discuss the results with agency reviewers. At this point, an applicant should have an opportunity to submit further information if needed. If this yields new information, the application may be re-scored;
- Final results will then be provided to the applicant. The applicant may choose to move forward; withdraw; or submit to Advisory Committee review;
- A standing Advisory Committee (AC) should be convened representing the planning units (however the AC will not include Ecology or DFW. For any particular application, the AC also will not include the applicant). The role will be to review disputed scores through some kind of structured process that includes hearing from both Ecology and the applicant;
- After reviewing an application submitted for review, the AC will provide written recommendations and findings to Ecology and the applicant regarding the proposal's consistency with the purpose, intent and requirements of the Watershed Plan and adopted guidelines;
- Upon receipt of review comments from the AC, Ecology will have the final word on how to proceed. Ecology may choose to re-score the application; or leave the scoring intact. Ecology is not required to follow the AC recommendation. At that point, Ecology will issue the decision on:
 - ◆ whether to approve or deny the application, including the mitigation program. This should be accompanied by documentation of the rationale for the decision, with reference to the scoring system;
 - ◆ if approved, Ecology's Report of Examination will detail the conditions to be associated with the water right, including mitigation requirements; and
 - ◆ how much the reservation will be debited.
- As with any other water right decision, the decision is appealable through the Pollution Control Hearings Board.

The steps above will require materials to be developed that would be used in the application process. These include: a) an application form/questionnaire designed to obtain the information needed for evaluation and scoring; b) a fact sheet or guidance document explaining in summary form how the scoring process works and what kind of mitigation features will earn higher credit; and c) a scoring sheet that allows staff to score applications efficiently and consistently (the scoring sheet will presumably be electronic, so it performs the scoring automatically as staff input information).

In addition, the Subcommittee believes Ecology and DFW should also develop a simple training program for staff charged with reviewing applications from WRIAs 25-28.

10.0 Items Requiring Further Development

This report has addressed a number of interrelated aspects of the strategy for managing water rights reservations in WRIAs 25-28. For some of these aspects, more work remains to be done to provide for effective implementation. As LCFRB and the Planning Units continue to work on the Detailed Implementation Plan (Phase 4 of the watershed planning process), the following items should receive further attention:

- Specific details of the cost considerations, to support implementation. This should include consideration of how the procedure can work effectively for small water systems in the region;
- Attention to how small water systems can utilize the program, with limited resources. As indicated in the Watershed Management Plans, this may include allowing for payments into a mitigation fund, in lieu of undertaking small mitigation actions;
- Further development of a mitigation banking approach for access to water right reservations;
- Development of the procedures and documents Ecology would need for applicants to be able to document their mitigation proposals and to support the scoring procedure;
- For scoring habitat/watershed actions, and for those elements that depend on IFIM results derived from larger rivers in the region, there is a need to downscale the scoring system so it can be suitable for smaller streams;
- Further attention to how performance standards can be established, so that mitigation actions can be determined suitable and effective after construction; and
- Further attention is needed at the “front-end” of the process, to set standards for analysis of alternative sources of supply that could minimize or avoid depletion of stream flows.

Attachment A

WRIA 25/26 Grays-Elochoman and Cowlitz Watershed Management Plan Reserved Water Strategy Implementation

Policy Background

The reserved water strategy outlined in the WRIA 25/26 Grays-Elochoman and Cowlitz Watershed Management Plan (hereafter Plan) is based upon the following policies and goals that are designed to balance the objectives of water supply and stream flow protection:

“Public and private water users throughout WRIs 25 and 26 should have access to water resources to meet new or expanded needs for water supply consistent with adopted land use plans. To facilitate coordinated planning and ensure consistency with adopted land use plans, decisions regarding water use and allocation should be coordinated between Department of Ecology and affected jurisdictions.” (Policy WSP-1, Pg 3-9)

“Water resource development to meet new or expanded needs should avoid or minimize effects on stream flows or aquatic habitat, in stream reaches where flow conditions are an important factor for sustaining aquatic life, including fish populations in their various life stages.” (Policy WSP-2, Pg 3-19)

“Manage stream flows to effectively support fish recovery and habitat enhancement plans.” (Goal, Section 4.1, Pg 4-1)

Much of the policy discussion that provides the foundation and rationale for the reserved water concept is found in Section 4.1.1 of the Plan. This discussion emphasizes the need to identify water sources that will not cause significant effects on stream flow or aquatic habitat. As part of the instream flow protection strategy, the Planning Unit recommended Policy SFP-2 (Pg 4-6), which would restrict issuance of new water rights that would reduce low flows, except under certain pre-defined circumstances. This policy “recognizes that total closure of streams to all new water right applications would conflict with the goal of ensuring adequate water supplies are available for the region (Pg 4-3)”. Therefore the policy has conditions for:

- Domestic wells, served by septic systems;
- Specific communities that may not have access to alternative supplies. In these cases a pre-defined quantity of water will be “reserved” for possible allocation to that community. The reserved quantity will be defined in terms of the unmitigated stream flow depletion that will result from development of new supply capacity; and
- Other communities and industries that may need supplies in the future, but whose needs cannot be well-defined at this time. Again, a pre-defined quantity will be reserved to meet these needs.

The reserved supplies discussed above (except for domestic wells) can be tapped only if the community first demonstrates there is no other practicable alternative, commits to effective stewardship through conservation and/or production of reclaimed water; and commits to offsetting actions and mitigating actions that minimize the effects on stream flow or aquatic habitat. Actions will be evaluated within the context of other supply alternatives, water supply total project cost, and the cost of the off-setting and mitigating actions. The procedure for municipalities to follow when requesting new or expanded water rights is found in Section 3.3.1 (Pg 3-10). Additional discussion and guidance relating to reservations and related mitigation is found in Appendix I (Pg I-6).

Determination of Reservation Quantities

Reservation quantities were established by the Planning Unit based primarily upon the following:

- Anticipated needs for municipalities and other user groups through 2020 (Policy SFP-2, Pg 4-18 through Pg 4-20); and
- Recommendations presented by the Washington Departments of Fish and Wildlife (WDFW) and Ecology for protection of instream flows (Appendix I, Pg I-28).

Anticipated needs were determined based upon growth projections and estimates associated with the various categories of water users, including large and small public water systems, domestic wells, and other beneficial uses. The forecasts were obtained from purveyor water system plans or other planning documents and were described in terms of average day demand (ADD) and maximum day demands (MDD) expressed in millions of gallons per day. Projected demands were compared to existing water right availability and capacity to determine projected future supply needs.

WDFW and Ecology provided the Planning Unit with recommendations for establishing water right reservations. The rationale for their recommendations is described in an October 4, 2004 memo from WDFW (Pgs I-28 through I-30). To determine acceptable flow reserves, the agencies identified flow quantities that equate to 1-2% reduction in wetted usable area for species of concern during the 90% exceedence flows in September and October. For watersheds where instream flow studies were not conducted, a 1-2% reduction in flow from the 90% exceedence flow during the low flow season was used as a surrogate. Thus the recommendations were based on very low-flow conditions (9 out of 10 days are as wet or wetter for that date). Because of their sensitivity to flow reduction, small streams were not recommended for establishment of reserves.

The final water right reservations reflected in the Plan represent a balance of the above considerations. Section 3.3.1 (Pg 3-12) describes water reservations as follows:

“In order to satisfy the goals associated with the establishment of closures and/or instream flows, and the goals associated with providing a secure source of water for future public water supply, it is recommended that in each basin a block of water be reserved for future

uses that would not be subject to the closures and/or instream flows established by rules for WRIAs 25 and 26.”

In many cases reservation quantities were consistent with WDFW and Ecology recommendations for instream flow protection. In other cases reservations to meet growth needs were established in areas where none were recommended by state agencies. Several reservations were also negotiated during the final plan development and adoption phases based on revised supply need considerations.

Reservation quantities were established and agreed upon based on the understanding that implementing the long-term water supply (e.g., regional source development) and stream flow strategies (e.g., regional source development) should result in improved instream flow conditions. Reservations should thus be viewed as negotiated quantities that are intended to represent an overall balance between instream flow and supply needs, within the context of the long-term strategies for water management and mitigation to offset stream impacts.

Definition of Water Reservation:

During the final stages of the 2006 remand process in WRIA 25/26, county concerns were raised regarding adequacy of reservations for several entities, as well as whether the table headings accurately reflected the reservation strategy. Concerns included whether identifying the previously defined “net streamflow depletion allowance” as the reservation amount in rule would create situations where only 50% of calculated water needs (Maximum Streamflow Depletion Allowance, 2004 Plan Table I-2a) could be secured because of the following limitation:

“Even in these limited cases, the amount of stream flow depletion from new water rights issued under this policy shall be no greater than the quantity shown in Table I-2a, under the column heading Net Stream Flow Depletion Allowance.” (December 2004 Plan, Pg I-6).

Under the above original Plan language, if the “net stream flow depletion after mitigation” quantity was calculated assuming that a 50% flow offset was possible, but in practice it was not, an applicant would only be entitled to 50% of their needed water supply and could not secure the remainder through mitigation. This was viewed as contrary to Plan guidance that allowed for mitigation of streamflow depletion through flow-related and/or habitat actions. As a result of this concern, the Planning Unit revised the Plan language and tables relating to water reservations.

The adopted Plan included changes to the quantity of water identified as the reservation. The discussion of reservations in Section 4.1.1 (Pg 4-3) states that the pre-defined quantity of water reserved for allocation will be defined in terms of the “unmitigated stream flow depletion that will result from development of new supply capacity”. Policy SFP-2 (Pg 4-6 and 4-18) also states that the reserved quantity for domestic wells, community systems, municipal systems and other beneficial uses represents the “unmitigated stream flow depletion” in each subbasin. The relationship between stream flow depletion and water reservations was further clarified in revisions to Sections 3.3.1 (Pg 3-11) and Appendix I (Pg I-6). These sections state the following:

“In no case shall the amount of stream flow depletion from new water rights issued under this policy exceed the quantity shown in Table I-2, under the column heading “unmitigated streamflow depletion allowance”, or the 2% recommended flow reserves (column 4, “recommendation for flow reserve”) outlined in the October 4, 2004 memo from WDFW (see page I-29), **whichever is less**, subject to the following exceptions: for the Grays River, Skamokawa Creek, Elochoman River, and Abernathy/Germany Creek Subbasins, the amount of stream flow depletion under this policy shall not exceed the quantity shown in Table I-2, under the “unmitigated streamflow depletion allowance” column.”

The above wording further establishes the reservation as the “unmitigated stream flow depletion”, but also references use of the 2% recommended flow reserve, with specific exceptions, if that quantity is less.

The above changes highlighted the need to ensure that the reservation tables accurately reflect the sequential relationship between unmitigated stream flow, offset requirements, and the resulting target depletion allowance. Tables ES-3 (Pg ES-12), 4-4 (Pg 4-20 through 4-22), I-2 (Pgs I-17 through 19 – Attachment 1), and I-2a (Pgs H-19 through H-24 - Attachment 2), were modified to include the following three columns:

- “Unmitigated Streamflow Depletion Allowance” – this column represents the water reservation based on supply need through 2020;
- “Water Right Acquisition/Flow Augmentation Offset (Maximum Extent Practicable)” – this column refers to the requirement of water users to offset at least 50 percent of their future water uses through acquisition of water rights or flow augmentation, to the maximum practicable. This column does not apply to domestic wells; and
- “Target Streamflow Depletion Allowance” – this column is calculated as the unmitigated streamflow depletion minus the Water Right Acquisition/Flow Augmentation Offset requirement.

These table revisions were intended to more clearly describe the sequential relationship between reservations and mitigation and the intent of each column heading, and to ensure that an applicant’s ability to secure use of the reservation through mitigation is not precluded.

Implementation Roles and Responsibilities:

The Plan recognizes that the Department of Ecology is the entity responsible for making water right permit decisions and applying the reservation strategy, and also acknowledges the role of WDFW in evaluating requests for reservation use. In addition, the Plan calls for coordination with affected entities. Sections 3.3.1 (Pg 3-10 through 3-12) and Appendix I (Pg I-6 and I-7) describe the following roles and responsibilities:

“The Department of Ecology has the responsibility for reviewing water right applications. Under its current process, Ecology issues water right permits only if the proposed use meets the following requirements, in accordance with RCW 90.03.290...”

“The Planning Unit recommends that Ecology (in conjunction with Fish & Wildlife) evaluate requests for reservation use by reviewing the applicant’s analysis of other alternatives and by evaluating the applicant’s proposal in terms of off-setting and mitigating actions.” (Section 3.3.1, Pg 3-11; Appendix I, Pg I-6)

“Application for the reservation will be reviewed, analyzed, and processed by Ecology in consultation by Fish & Wildlife”... (Appendix I, Pg I-5)

“The Planning Unit recommends that decisions regarding the use of water right reservations be coordinated between the affected County, local governmental entities, Department of Ecology, and the Planning Unit.” (Section 3.3.1, Pg 3-12; Appendix I, Pg I-7)

These Plan sections re-affirm the regulatory and decision-making role of Ecology and WDFW, and also establish coordination roles for Counties, local governmental entities, and the Planning Unit. Specific coordination functions and roles are not described in the Plan, but will be defined in Section 3 (Roles and Responsibilities) of the Detailed Implementation Plan (DIP).

Water Reservation Accounting

The Plan does not outline a formal accounting process for tracking “debits” and “credits” associated with implementation of the reserved water strategy and mitigation banking. However, successful implementation of the reserved water strategy will require that Ecology, as the primary regulatory entity, establish an accounting system that addresses the various Plan elements.

The Plan identifies several categories of mitigation actions related to the decision making process outlined in Section 3.3.1 and Appendix I. These mitigation actions will be used to determine mitigation “credits” and “debits” related to use of the reservation. In some cases mitigation actions relate to specific steps in the decision-making process (e.g., determination of 50% flow requirement), but in other cases the intended application is broader and not associated with a single step in the evaluation process. The following is a summary of the mitigation action types recognized in the Plan, along with a description of their relationship to the evaluation process:

- “...where an applicant applies for a water right under a reservation, they be required to mitigate the predicted stream flow depletion to the maximum extent practicable through flow-related actions...” (Appendix I, Pg I-6; Section 3.3.1, Pg 3-11).

This language is not specific to any particular step in the decision making process and establishes that in developing an overall mitigation package for evaluation, applicants must rely upon flow-related actions to the maximum extent practicable.

- “No less than half of the unmitigated stream flow depletion (see Table I-2) must be offset through the acquisition of active upstream water rights or other flow augmenting actions in the same subbasin upstream of the new proposed water right.” (Appendix I, Pg I-6; Section 3.3.1, Pg 3-11).

This language establishes the minimum 50% flow mitigation requirement, and establishes that active water right acquisition and other flow augmenting actions can be used to

satisfy this requirement. This language refers specifically to the “Water Right Acquisition/Flow Augmentation Offset” columns in Tables I-2 and I-2a.

- “In these limited cases, acquisition of offsetting active water rights or flow augmentation actions shall be implemented to the extent feasible. Any remaining streamflow depletion shall be mitigated through other habitat actions designed to mitigate the effects of the stream flow depletion not being directly offset.” (Appendix I, Pg I-6; Section 3.3.1, Pg 3-11 and 3-12)

This language refers to situations when achieving the 50% flow mitigation through acquisition of active water rights and flow augmenting actions is not feasible or is cost-prohibitive. This wording establishes that under the specified circumstances habitat actions can be used to mitigate flow impacts. This language refers specifically to the “Water Right Acquisition/Flow Augmentation Offset” columns in Tables I-2 and I-2a.

- “The Planning Unit recommends that Ecology consider other mitigating actions to address impacts that cannot be practicably off-set (no more than half) through water-for-water actions. This includes actions such as the restoration of wetlands and side-channels that increase stream storage capacity. The Planning Unit supports consideration of mitigation credits for stream flow augmentation actions.” (Appendix I, Pg I-7; Section 3.3.1, Pg 3-11 and 3-12)

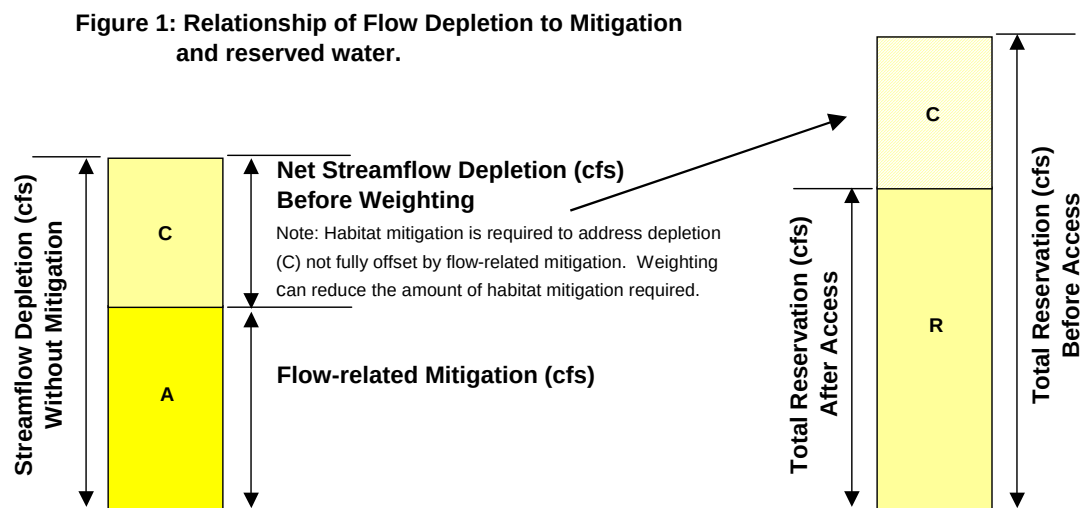
The above language is **distinct and separate from** the previous provisions relating to situations where providing the 50% flow mitigation is not practicable. Given the separation of this discussion from the previous bullet, and the reference to actions that cannot be practicably off-set through water-for-water actions, this establishes that habitat actions such as wetland and side-channel restoration can be used to address residual impacts associated with the “Target Streamflow Depletion Allowance” columns.

- “The Planning Unit recommends that Ecology consider habitat restoration actions other than the restoration of wetlands and side-channels using the following criteria:
 - habitat actions should focus upon projects that improve stream conditions impaired by flow (e.g., projects that improve width to depth relationships or improve landscape-level hydrologic processes, etc.);
 - habitat actions should address threats and limiting factors through priority actions identified in the Lower Columbia Salmon Recovery Plan;
 - habitat actions should be evaluated within the context of when baseflow impacts will occur and the expected timeframe of habitat project benefits. (Section 3.3.1, Pg 3-11 and 3-12);

This language is also separate from the previous two bullets, is not associated with a specific step in the mitigation process, and establishes that habitat actions focusing on improving conditions impaired by flow or addressing priority habitat limiting factors can be used to off-set stream impacts. This category can therefore also be used to address impacts associated with the “Target Streamflow Depletion Allowance”.

The following (Figure 1) is a graphic representation of the relationship between mitigation actions, flow depletion and reservation accounting. The primary approach for mitigating streamflow depletion impacts is through flow-related actions. As described above, the Plan guidance and requirements emphasize that flow related actions must be used to the maximum

extent practicable in developing an overall mitigation package. The Plan calls for use of direct water right acquisition or other flow augmenting actions as the primary means to address the “Water Right Acquisition/Flow Augmentation Offset” (Segment A), with use of habitat actions where this is not feasible. If streamflow depletion is fully mitigated through flow-related actions, the reservation would not be debited and would remain available for future access. However, if impacts are only partially offset or not offset at all through flow-related actions (Figure 1, Segment A), the remaining streamflow depletion (Figure 1, Segment C) is “debited” from the reserve. As depicted in Segment C, habitat actions will also be required to offset net streamflow depletion impacts, but will not be used to reduce the amount of “debit” from the reservation. However, additional instream flow benefits that result in up-weighting of the flow-related mitigation credits can be used to reduce the amount of habitat mitigation required to address net stream flow depletion as represented by Segment C.⁴



Addressing Water Reservations in Rule:

The WRIA Plan calls for incorporation of water right reservations into State Rules. Specifically, Policy SFP-2 (Pgs 4-6 and 4-18) states the following:

“The Department of Ecology should adopt State Rules (WACs) under its Instream Resources Protection Program to restrict issuance of new water rights in WRIAs 25 and 26. In all affected streams reaches a closure should be established, but with certain exceptions as indicated below.”

In addition, the discussion of water reservations in Section 3.3.1 includes the following recommendation:

“In order to satisfy the goals associated with the establishment of closures and/or instream flows, and the goals associated with providing a secure source of water for

⁴ See Integrated Strategy for Implementing Water Right Reservations, Section 2.0 (Reservation Accounting), for a description of flow-related mitigation up-weighting.

future public water supply, it is recommended that in each basin a block of water be reserved for future uses that would not be subject to the closures and/or instream flows established by rules for WRIAs 25 and 26”. (Recommendation, Page 3-12)

Pages 3-12 and 3-13 provides further guidance regarding incorporation of water reservations into state rule:

“The amount of water, the entity, and the source(s) of the water to be reserved for public supply is recommended by the Planning Unit in Appendix I (Table I-2) and is intended to be stated in the proposed stream flow protection rules to be adopted by the Department of Ecology for WRIAs 25 and 26”

The WRIA 25/26 Plan clearly calls for providing water reservations in rule, and refers to Table I-2 for further defining the content of this rule. Table I-2 includes the three columns described above, including the “unmitigated stream flow depletion” quantity. Because Section 4.1.1 (Pg 4-3) and Policy SFP-2 (Pg 4-6 and 4-18) define the “unmitigated stream flow depletion” as the water reservation amount, this quantity should be identified as such in rule. Application of the reservation strategy must also be within the context of the additional guidance and procedures found in Sections 3.3.1 (Pg 3-11) and Appendix I (Pg I-6), discussed above. The following should therefore be incorporated as part of the rule language:

- Sections 3.3.1 (Pg 3-11 through 3- 13) and Appendix I - Section IV (Pgs I-6 and I-7); and
- Tables ES-3 (Pg ES-12), 4-4 (Pg 4-20 through 4-22), I-2 (Pgs I-17 through 19 – Attachment 1), and I-2a (Pgs H-19 through H-24)

Attachments: Attachment 1 – Table I

Attachment 2 – Table I-2a

Table I-2
Water Right Reservation Summary for WRIAs 25/26

Water User ⁽¹⁾	Unmitigated Streamflow Depletion Allowance (cfs)⁽²⁾	Water Right Acquisition/Flow Augmentation Offset (Maximum Extent Practicable⁽⁷⁾)(cfs)⁽³⁾	Target Streamflow Depletion Allowance (cfs)⁽⁴⁾
<i>Grays River Subbasin</i>			
Wahkiakum PUD	0.30	0.15	0.15
Small Community Water Systems- Wahkiakum Co.	0.75	0.37	0.37
Domestic Wells – Wahkiakum Co.	0.20	0.00	0.20
Subbasin Total	1.25		0.72
<i>Skamokawa Creek Subbasin</i>			
Domestic Wells	0.20	0.00	0.20
Subbasin Total	0.20		0.20
<i>Elochoman River Subbasin</i>			
Cathlamet	0.00	0.00	0.00 ⁽⁵⁾
Small Community Water Systems –Wahkiakum Co.	0.37	0.19	0.19
Domestic Wells – Wahkiakum Co.	0.20	0.00	0.20
Subbasin Total	0.57		0.39
<i>Abernathy/Germany Creek Subbasin</i>			
Wahkiakum Co. Portion			
Domestic Wells	0.07	0.00	0.07
Cowlitz Co. Portion			
Domestic Wells	0.36	0.00	0.36
Subbasin Total	0.43		0.43
<i>Coal Creek/Longview Slough Subbasin</i>			
Not Applicable (restrictions on new water rights not proposed)	N/A		
<i>Upper Cowlitz River Subbasin</i>			
Randle – Other Beneficial Uses	0.24	0.12	0.12
Packwood	0.00	0.00	0.00 ⁽⁵⁾
Small Community Water Systems – Lewis Co.	0.37	0.19	0.19
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	0.75	0.37	0.37
Subbasin Total	1.37		0.69
<i>Cispus River Subbasin</i>			
Lewis Co. Portion			
Small Community Water Systems – Lewis Co.	0.37	0.19	0.19
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	0.37	0.19	0.19
Skamania Co. Portion			
Small Community Water Systems – Skamania Co.	0.37	0.19	0.19
Domestic Wells Skamania Co.	0.01	0.00	0.01
Other Beneficial Uses – Skamania Co.	0.37	0.19	0.19
Subbasin Total	1.5		0.78
<i>Tilton River Subbasin</i>			
Morton			0.00 ⁽⁵⁾
Small Community Water Systems – Lewis Co.	0.37	0.19	0.19
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	0.37	0.19	0.19
Subbasin Total	0.75		0.39

Table I-2
Water Right Reservation Summary for WRIAs 25/26

Water User ⁽¹⁾	Unmitigated Streamflow Depletion Allowance (cfs)⁽²⁾	Water Right Acquisition/Flow Offset (Maximum Extent Practicable⁽⁷⁾)(cfs)⁽³⁾	Target Streamflow Depletion Allowance (cfs)⁽⁴⁾
<i>Mayfield Dam Subbasin</i>			
Mossyrock	0.20	0.10	0.10
Small Community Water Systems – Lewis Co.	0.37	0.19	0.19
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	0.37	0.19	0.19
Subbasin Total	0.95		0.49
<i>Toutle River Subbasin</i>			
Lewis Co. Portion			
Small Community Water Systems – Lewis Co.	0.37	0.19	0.19
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	0.37	0.19	0.19
Cowlitz Co. Portion			
Small Community Water Systems – Cowlitz Co.	0.37	0.19	0.19
Domestic Wells – Cowlitz Co.	0.01	0.00	0.01
Other Beneficial Uses – Cowlitz Co.	0.37	0.19	0.19
Skamania Co. Portion			
Small Community Water Systems – Skamania Co.	0.37	0.19	0.19
Domestic Wells – Skamania Co.	0.00	0.00	0.00
Other Beneficial Uses – Skamania Co.	0.37	0.19	0.19
Subbasin Total	2.24		1.14
<i>Coweeman River Subbasin</i>			
Small Community Water Systems – Cowlitz Co.	0.37	0.19	0.19
Domestic Wells – Cowlitz Co.	0.01	0.00	0.01
Subbasin Total	0.38		0.20
<i>Lower Cowlitz River Subbasin</i>			
Lewis Co. Portion			
Winlock	.33	0.165	0.165
Toledo	0.47	0.24	0.24
Vader	0.00	0.00	0.00 ⁽⁵⁾
Small Community Water Systems – Lewis Co.	0.75	0.37	0.37
Domestic Wells – Lewis Co.	0.01	0.00	0.01
Other Beneficial Uses – Lewis Co.	6.6	3.3	3.3
Cowlitz Co. Portion			
Longview			NA ⁽⁶⁾
Kelso			NA ⁽⁶⁾
Cowlitz PUD			NA ⁽⁶⁾
Castle Rock	2.6	1.3	1.3
Small Community Water Systems – Cowlitz Co.	0.75	0.37	0.37
Domestic Wells – Cowlitz Co.	0.01	0.00	0.01
Other Beneficial Uses – Cowlitz County	0.75	0.37	0.37
Subbasin Total	12.27		6.135

Notes:

(1) Categories of water users include:

- Large Public Water Systems, which are listed individually.
 Small Community Water Systems.
 Domestic Wells, including those serving multiple homes but exempt from the requirement to apply for a water right permit.
 Other Beneficial Uses, such as self-supplied industrial uses.
- (2) Calculated based upon an estimate of additional water rights needed to meet water demands through 2020. The Unmitigated Streamflow Depletion refers to the total amount of streamflow reduction allowed within the subbasin as a result of pumping or diversion. In some cases, the amount is equal to the anticipated need (Qi). In other cases, the amount is lower, recognizing that a portion or all of the need may be met using groundwater supplies. In these cases, the impacts to streams may be lower than the amount of water withdrawn from the aquifer. For domestic wells, the depletion amount (or potential streamflow impact) is calculated as 30% of the anticipated need, taking into account that an estimated 70% of water pumped from such wells is returned to streamflows via septic system returns.
- (3) Refers to the requirement of water users to offset 50 percent of their future water uses through acquisition of water rights or flow augmentation. Does not apply to Domestic Wells.
- (4) Calculated as the Unmitigated Streamflow Depletion minus the Water Right Acquisition/Flow Augmentation Offset requirement. This allowance applies only to impacts upon mainstem flows; it is not intended to allow for extensive dewatering of smaller water bodies. Water right applicants must provide further evidence regarding potential impacts to smaller tributary creeks resulting from new or expanded water resource development.
- (5) Current water rights are sufficient to meet needs through year 2020. Therefore no reservation is established.
- (6) Not applicable, due to location in tidally influenced area.
- (7) See pages I-6 and I-7 for a description of off-setting and mitigation actions.

Table I-2a
 Water Right Reservation Calculations for WRIAs 25/26

	Anticipated Needs ⁽¹⁾			Unmitigated Streamflow Depletion Allowance (cfs) ⁽³⁾	Water Right Acquisition/ Flow Augmentation	Target Streamflow Depletion Allowance (cfs) ⁽⁵⁾
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)		Offset (Maximum Extent Practicable ⁽¹⁰⁾) (cfs) ⁽⁴⁾	
Grays River Subbasin						
Wahkiakum PUD Small Community Water Systems -	NA	0	0.30	0.30	0.15	0.15
Wahkiakum Co Domestic Wells -	2	200	0.75	0.75	0.37	0.37
Wahkiakum Co	NA	177	0.65	0.20	0.00	0.20
Subbasin Total						0.72
Skamokawa Creek Subbasin						
Domestic Wells - Wahkiakum Co	NA	177	0.65	0.20	0.00	0.20
Subbasin Total						0.20
Elochoman River Subbasin						
Cathlamet Small Community Water Systems -	NA	0	0.00	0.00	0.00	0.00 ⁽⁶⁾
Wahkiakum Co Domestic Wells -	1	100	0.37	0.37	0.19	0.19
Wahkiakum Co	NA	177	0.65	0.20	0.00	0.20
Subbasin Total						0.38

Table I-2a
Water Right Reservation Calculations for WRIAs 25/26

	Anticipated Needs ⁽¹⁾			Unmitigated Streamflow Depletion Allowance (cfs) ⁽³⁾	Water Right Acquisition/ Flow Augmentation Offset (Maximum Extent Practicable ⁽¹⁰⁾) (cfs) ⁽⁴⁾	Target Streamflow Depletion Allowance (cfs) ⁽⁵⁾
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)			
Abernathy/Germany Creek Subbasin						
Domestic Wells - Wahkiakum Co	NA	59	0.22	0.07	0.00	0.07
Domestic Wells - Cowlitz Co	NA	330	1.21	0.36	0.00	0.36
Subbasin Total						0.43
Coal Creek/Longview Slough Subbasin						
Not Applicable (restrictions on new water rights not proposed)						NA
Upper Cowlitz River Subbasin						
Randle ⁽⁷⁾	NA	NA	0.24	0.24	0.12	0.12
Packwood Small Community Water Systems - Lewis Co	NA	0	0.00	0.00	0.00	0.00 ⁽⁶⁾
Domestic Wells - Lewis Co	1	100	0.37	0.37	0.19	0.19
Other Beneficial Uses - Lewis Co	NA	2	0.01	0.01	0.00	0.01
	2	200	0.75	0.75	0.37	0.37
Subbasin Total						0.69 ⁽⁸⁾
Cispus River Subbasin						
Small Community Water Systems - Lewis Co	1	100	0.37	0.37	0.19	0.19
Small Community Water Systems - Skamania Co	1	100	0.37	0.37	0.19	0.19
Domestic Wells - Lewis Co	NA	2	0.01	0.01	0.00	0.01
Domestic Wells - Skamania Co	NA	2	0.01	0.01	0.00	0.01
Other Beneficial Uses - Lewis Co	1	100	0.37	0.37	0.19	0.19
Other Beneficial Uses - Skamania Co	1	100	0.37	0.37	0.19	0.19
Subbasin Total						0.78

Table I-2a
Water Right Reservation Calculations for WRIAs 25/26

	Anticipated Needs ⁽¹⁾			Unmitigated Streamflow Depletion Allowance (cfs) ⁽³⁾	Water Right Acquisition/ Flow Augmentation Offset (Maximum Extent Practicable ⁽¹⁰⁾)	Target Streamflow Depletion Allowance (cfs) ⁽⁵⁾	
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)		(cfs) ⁽⁴⁾		
Tilton River Subbasin							
Morton Small Community Water Systems - Lewis Co	NA	0	0.00	0.00	0.00	0.00	⁽⁶⁾
Domestic Wells - Lewis Co	1	100	0.37	0.37	0.19	0.19	
Other Beneficial Uses - Lewis Co	NA	4	0.01	0.01	0.00	0.01	
	1	100	0.37	0.37	0.19	0.19	
Subbasin Total						0.39	
Mayfield Dam Subbasin							
Mossyrock Small Community Water Systems - Lewis Co	NA	28	0.20	0.20	0.10	0.10	
Domestic Wells - Lewis Co	1	100	0.37	0.37	0.19	0.19	
Other Beneficial Uses - Lewis Co	NA	5	0.02	0.01	0.00	0.01	
	1	100	0.37	0.37	0.19	0.19	
Subbasin Total						0.48	⁽⁸⁾
Toutle River Subbasin							
Small Community Water Systems - Lewis Co	1	100	0.37	0.37	0.19	0.19	
Small Community Water Systems - Cowlitz Co	1	100	0.37	0.37	0.19	0.19	
Small Community Water Systems - Skamania Co	1	100	0.37	0.37	0.19	0.19	
Domestic Wells - Lewis Co	NA	2	0.01	0.01	0.00	0.01	
Domestic Wells - Cowlitz Co	NA	6	0.02	0.01	0.00	0.01	
Domestic Wells - Skamania Co	NA	0	0.00	0.00	0.00	0.00	
Other Beneficial Uses - Lewis Co	1	100	0.37	0.37	0.19	0.19	
Other Beneficial Uses - Cowlitz Co	1	100	0.37	0.37	0.19	0.19	
Other Beneficial Uses - Skamania Co	1	100	0.37	0.37	0.19	0.19	

Table I-2a
Water Right Reservation Calculations for WRIAs 25/26

	Anticipated Needs ⁽¹⁾			Unmitigated Streamflow Depletion Allowance (cfs) ⁽³⁾	Water Right Acquisition/ Flow Augmentation Offset (Maximum Extent Practicable ⁽¹⁰⁾) (cfs) ⁽⁴⁾	Target Streamflow Depletion Allowance (cfs) ⁽⁵⁾
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)			
Subbasin Total						1.14
Coweeman River Subbasin						
Small Community Water Systems - Cowlitz Co	1	100	0.37	0.37	0.19	0.19
Domestic Wells - Cowlitz Co	NA	8	0.03	0.01	0.00	0.01
Subbasin Total				0.38	0.19	0.20
Lower Cowlitz River Subbasin						
Longview	(Not applicable, due to location in tidally influenced area. ⁽⁹⁾)					
Kelso	(Not applicable, due to location in tidally influenced area. ⁽⁹⁾)					
Cowlitz PUD	(Not applicable, due to location in tidally influenced area. ⁽⁹⁾)					
Castle Rock ⁽⁷⁾	NA	NA	2.60	2.60	1.30	1.30
Winlock ⁽⁷⁾	NA	NA	0.33	0.33	0.165	0.165
Toledo ⁽⁷⁾	NA	NA	0.47	0.47	0.24	0.24
Vader	NA	0	0.00	0.00	0.00	0.00 ⁽⁶⁾
Small Community Water Systems - Cowlitz Co	2	200	0.75	0.75	0.37	0.37
Small Community Water Systems - Lewis Co	2	200	0.75	0.75	0.37	0.37
Domestic Wells - Cowlitz Co	NA	6	0.01	0.01	0.00	0.01
Domestic Wells - Lewis Co	NA	5	0.01	0.01	0.00	0.01
Other Beneficial Uses - Cowlitz Co	2	200	0.75	0.75	0.37	0.37
Other Beneficial Uses - Lewis Co	NA	NA	6.60	6.60	3.30	3.30
Subbasin Total				12.27		6.135 ⁽⁸⁾

Notes:

⁽¹⁾ Qa = Annual Allotment; Qi = Instantaneous Quantity; afy = acre-feet per year; cfs = cubic feet per second
Anticipated needs are calculated in the following ways for four different types of water users:

Large Public Water Systems - Needs are based upon deficiencies in existing water rights to meet water demand growth projected to 2020.

Table I-2a
Water Right Reservation Calculations for WRIAs 25/26

<u>Anticipated Needs ⁽¹⁾</u>			Unmitigated Streamflow Depletion Allowance (cfs) ⁽³⁾	Water Right Acquisition/ Flow Augmentation Offset (Maximum Extent Practicable ⁽¹⁰⁾) (cfs) ⁽⁴⁾	Target Streamflow Depletion Allowance (cfs) ⁽⁵⁾
No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)			

Small Community Water Systems - Needs are noted in terms of "blocks" or quantities of water. The number of blocks assigned to each subbasin is based upon the general likelihood of future water demand growth by these types of consumers in that area (e.g., there will likely be more such growth in the Lower Cowlitz River Subbasin, than in the Upper Cowlitz River Subbasin, due to the land use differences in these two subbasins.)

Domestic Wells - Needs are based upon estimated growth in the number of domestic wells by 2020. Domestic wells include those serving multiple homes but are exempt from the requirement to apply for a water right permit.

Other Beneficial Uses - Needs are noted in terms of "blocks" or quantities of water, using a similar rationale as applied to Small Community Water Systems, needed to meet water demand growth to 2020.

- (2) 1 "block" = 100 afy water right on a Qa basis (or approx. 90,000 gallons per day on an average day basis)
= 0.37 cfs water right, on a Qi basis (assuming a maximum day:average day peaking factor of 2.0, and an instantaneous:maximum day peaking factor of 1.33)
- (3) Calculated based upon an estimate of additional water rights needed to meet water demands through 2020. The Unmitigated Streamflow Depletion refers to the total amount of streamflow reduction allowed within the subbasin as a result of pumping or diversion. In some cases, the amount is equal to the anticipated need (Qi). In other cases, the amount is lower, recognizing that a portion or all of the need may be met using groundwater supplies. In these cases, the impacts to streams may be lower than the amount of water withdrawn from the aquifer. For domestic wells, the depletion amount (or potential streamflow impact) is calculated as 30% of the anticipated need, taking into account that an estimated 70% of water pumped from such wells is returned to streamflows via septic system returns.
- (4) Refers to the requirement of water users to offset 50 percent of their future water uses through acquisition of water rights or flow augmentation. Does not apply to Domestic Wells.
- (5) Calculated as the Unmitigated Streamflow Depletion minus the Water Right Acquisition/Flow Augmentation Offset requirement. This allowance applies only to impacts upon mainstem flows; it is not intended to allow for extensive dewatering of smaller water bodies. Water right applicants must provide further evidence regarding potential impacts to smaller tributary creeks resulting from new or expanded water resource development.
- Allowances are to be considered available only for the category to which they are assigned. However, every 5 years, Ecology and local parties should review the status and use of the allowances and may shift allowance quantities between categories to better address needs, so long as the subbasin total allowance does not change.
- (6) Current water rights are sufficient to meet needs through year 2020. Therefore no reservation is established.
- (7) Revised water demand projections were determined during the 2005/2006 watershed plan remand process, and are not reflected in previous assessments and growth management projections.
- (8) The size of reservations in the Upper Cowlitz, Mayfield Dam, and Lower Cowlitz Subbasins are under review by the Planning Unit. These reservations may be increased, recognizing that flows on the mainstem Cowlitz River greatly exceed minimum flows needed for aquatic habitat. For the same reason, mitigation requirements may be reduced to some extent for any new withdrawals affecting the mainstem Cowlitz River.
- (9) The sources of water supply used by this purveyor are located within the tidally-influenced portion of the Lower Cowlitz River, which will remain open for new appropriations. Therefore, no water right reservations are required.
- (10) See pages I-6 and I-7 for a description of off-setting and mitigation actions.

Attachment B

WRIA 27/28 Salmon/Washougal and Lewis Watershed Management Plan Reserved Water Strategy Implementation

Policy Background

The reserved water strategy outlined in the WRIA 27/28 Salmon/Washougal and Lewis Watershed Management Plan (hereafter Plan) is based upon the following policies and goals that are designed to balance the objectives of water supply and stream flow protection:

“Public and private water users throughout WRIs 27 and 28 should have access to water resources to meet new or expanded needs for water supply consistent with adopted land use plans.” (Policy WSP-1, Pg 3-10)

“Water resource development to meet new or expanded needs should avoid or minimize effects on stream flows or aquatic habitat in stream reaches where flow conditions are an important factor for sustaining aquatic life, including fish populations in their various life stages.” (Policy WSP-2, Pg 3-10)

“Manage stream flows effectively to sustain aquatic biota, including fish populations in their various life stages.” (Objective, Section 1.3, Pg 1-4)

Much of the policy discussion that provides the foundation and rationale for the reserved water concept is found in Section 4.1.1 of the Plan. This discussion emphasizes the need to identify water sources that will not cause significant effects on stream flow or aquatic habitat. As part of the instream flow protection strategy, the Planning Unit recommended Policy SFP-2 (Pg 4-6), which would prohibit issuance of new water rights that would reduce low flows, except under certain pre-defined circumstances. This policy “recognizes that a total closure of streams to all new water right applications would conflict with the goal of ensuring adequate water supplies are available for the region” (Pg 4-3). Therefore the policy has exceptions for the following selected purposes:

- Domestic wells, served by septic systems;
- Specific communities that may not have access to alternative supplies. In these cases a pre-defined quantity of water will be “reserved” for possible allocation to that community. **The reserved quantity will be defined in terms of the net effect on stream flow from development of new supply capacity (emphasis added).**
- Other communities and industries that may need supplies in the future, but whose needs cannot be well-defined at this time. Again, a pre-defined quantity will be reserved to meet these needs. (Pg 4-3)

The reserved supplies discussed above (except for domestic wells) can be tapped only if the community first demonstrates there is no other practicable alternative, commits to effective stewardship through conservation and/or production of reclaimed water; and commits to offsetting actions and mitigating actions that minimize the effects on stream flow or aquatic habitat. Actions will be evaluated within the context of other supply alternatives, water supply total project cost, and the cost of the off-setting and mitigating actions. The procedure for municipalities to follow when requesting new or expanded water rights is found in Section 3.3.1 (Pg 3-11). Additional discussion and guidance relating to reservations and related mitigation is found in Appendix H (Pg H-2).

Determination of Reservation Quantities

Reservation quantities were established by the Planning Unit based primarily upon the following:

- Anticipated needs for municipalities and other user groups through 2020 (Policy SFP-2, Pg 4-19; Pg 4-20); and
- Recommendations presented by Washington Departments of Fish and Wildlife (WDFW) and Ecology for protection of instream flows (Appendix H, Pg H-25);

Anticipated needs were determined based upon growth projections and estimates associated with the various categories of water users, including large and small public water systems, domestic wells, and other beneficial uses. The forecasts were obtained from purveyor water system plans and other planning documents and were described in terms of average day demand (ADD) and maximum day demands (MDD) expressed in millions of gallons per day. Projected demands were compared to existing water right availability and capacity to determine projected future supply needs.

WDFW and Ecology provided the Planning Unit with recommendations for establishing water right reservations. The rationale for their recommendations is described in an October 4, 2004 memo from WDFW (Pgs H-25 and H-26). To determine acceptable flow reserves, the agencies identified flow quantities that equate to 1-2% reduction in wetted usable area for species of concern during the 90% exceedence flows in September and October. For watersheds where instream flow studies were not conducted, a 1-2% reduction in flow from the 90% exceedence flow during the low flow season was used as a surrogate. Thus the recommendations were based on very low-flow conditions (9 out of 10 days are as wet or wetter for that date). Because of their sensitivity to flow reduction, small streams were not recommended for establishment of reserves.

The final water right reservations reflected in the Plan represent a balance of the above considerations. Section 3.3.1 (Pg 3-13) describes water reservations as follows:

“In order to satisfy the goals associated with the establishment of closures and/or instream flows, and the goals associated with providing a secure source of water for future public water supply, it is recommended that in each basin a block of water be reserved for future

public water supply that would not be subject to the closures and/or instream flows established by rules for WRIAs 27 and 28.”

In many cases reservation quantities were consistent with WDFW and Ecology recommendations for instream flow protection. In other cases reservations to meet growth needs were established in areas where none were recommended by state agencies. Several reservations were negotiated during the final plan development and adoption phases based on revised supply need considerations.

Reservation quantities were established and agreed upon based on the understanding that implementing the long-term water supply (e.g., regional source development) and stream flow strategies (e.g., regional source development) should result in improved instream flow conditions. Reservations should thus be viewed as negotiated quantities that are intended to represent an overall balance between instream flow and supply needs, within the context of the long-term strategies for water management and mitigation to offset stream impacts.

Definition of Water Reservation:

Numeric reservations are presented in water right reservation summary tables found in several areas of the Plan:

- Table ES-3 (Pg ES-12)
- Table 4-4 (Pg 4-21)
- Table H-2 (Pgs H-17 and H-18) (Attachment 1)
- Table H-2a (Pgs H-19 and H-20) (Attachment 2)

Tables ES-3, 4-4 and H-2 all identify the amount of water, the entity, and the sources of water to be reserved for public supply. These tables all refer to the “net stream flow depletion allowance after mitigation (cfs)”. Table H-2a includes a “net stream flow depletion after mitigation” column as well, and also includes columns for anticipated needs, stream flow depletion without mitigation, and offset/mitigation requirements, all expressed numerically in cfs. These tables suggest that the “net streamflow depletion allowance after mitigation” column is intended to represent stream flow “reservations”.

Policy SFP-2 states that the “rules adopted shall not prevent issuance of water rights for selected purposes and uses” (Pg 4-6 and 4-19). With regard to domestic wells, small community systems, other beneficial uses, and municipal water systems, this policy states that these quantities “represent the net depletion of stream flow in each subbasin...”. The discussion of reservations in Section 4.1.1 (Pg 4-3) also states that “the reserved quantity will be defined in terms of the net effect on stream flow from development of new supply capacity.” These references and the tables discussed above all confirm that the numeric quantity that constitutes the water right “reservation” is the “net stream flow depletion allowance after mitigation”.

Implementation Roles and Responsibilities:

The Plan recognizes that the Department of Ecology is the entity responsible for making water right permit decisions and applying the reservation strategy, and also acknowledges the role of WDFW in evaluating requests for reservation use. Sections 3.3.1 (Pg 3-11 through 3-13) and Appendix H (Pg H-6 and H-7) describe the following roles and responsibilities:

“The Department of Ecology has the responsibility for reviewing water right applications. Under its current process, Ecology issues water right permits only if the proposed use meets the following requirements, in accordance with RCW 90.03.290...” (Section 3.3.1, Pg 3-11)

“The Planning Unit recommends that Ecology (in conjunction with Fish & Wildlife) evaluate requests for reservation use by reviewing the applicant’s analysis of other alternatives and by evaluating the applicant’s proposal in terms of off-setting and mitigating actions.” (Section 3.3.1, Pg 3-12; Appendix H, Pg H-6)

“Application for the reservation will be reviewed, analyzed, and processed by Ecology in consultation by Fish & Wildlife”... (Appendix H, Pg H-6)

These Plan sections affirm the regulatory and decision-making role of Ecology and WDFW in evaluating and processing water right applications under the reserved water strategy, and making determinations regarding adequacy of mitigation.

Water Reservation Accounting

The Plan does not outline a formal accounting process for tracking “debits” and “credits” associated with implementation of the reserved water strategy and mitigation banking. However, successful implementation of the reserved water strategy will require that Ecology, as the primary regulatory entity, establish an accounting system that addresses the various Plan elements.

The Plan identifies several categories of mitigation actions related to the decision making process outlined in Section 3.3.1 and Appendix H. These mitigation actions will be used to determine mitigation “credits” and “debits” related to use of the reservation. In some cases mitigation actions relate to specific steps in the decision-making process (e.g., determination of 50% flow requirement), but in other cases the intended application is broader and not associated with a single step in the evaluation process. The following is a summary of the mitigation action types recognized in the Plan, along with a description of their relationship to the evaluation process:

- “...where an applicant applies for a water right under a reservation, they be required to mitigate the predicted stream flow depletion to the maximum extent practicable through flow-related actions...” (Appendix H, Pg H-6; Section 3.3.1 Pg 3-12)

This language is not specific to any particular step in the decision making process and establishes that in developing an overall mitigation package for evaluation, applicants must rely upon flow-related actions to the maximum extent practicable.

- “No less than half of the predicted stream flow depletion (see Table H-2a) must be offset through the acquisition of active upstream water rights or other flow augmenting actions in the same subbasin upstream of the new proposed water right.” (Appendix H, Pg H-6; Section 3.3.1 Pg 3-12)

This language establishes the minimum 50% flow mitigation requirement, and establishes that active water right acquisition and other flow augmenting actions can be used to satisfy this requirement. This language refers specifically to the “Offset/Mitigation Requirement” column in Tables H-2a (Appendix H, Pg H-19)

- “In these limited cases, acquisition of offsetting active water rights or flow augmentation actions shall be implemented to the extent feasible. Any remaining offset requirement shall be mitigated through other habitat actions designed to offset the effects of the stream flow depletion not being offset.” (Appendix H, Pg H-7; Section 3.3.1, Pg 3 -12)

This language refers to situations when achieving the 50% flow mitigation through acquisition of active water rights and flow augmenting actions is not feasible or is cost-prohibitive. This wording establishes that under the specified circumstances habitat actions can be used to mitigate flow impacts. This language refers specifically to the “Offset/Mitigation Requirement” column in Table H-2a.

- “The Planning Unit recommends that Ecology consider other mitigating actions to address impacts that cannot be practicably off-set (no more than half) through water-for-water actions. This includes actions such as the restoration of wetlands and side-channels that increase stream storage capacity.” (Appendix H, Pg H-7; Section 3.3.1, Pg 3-12 and 3-13)

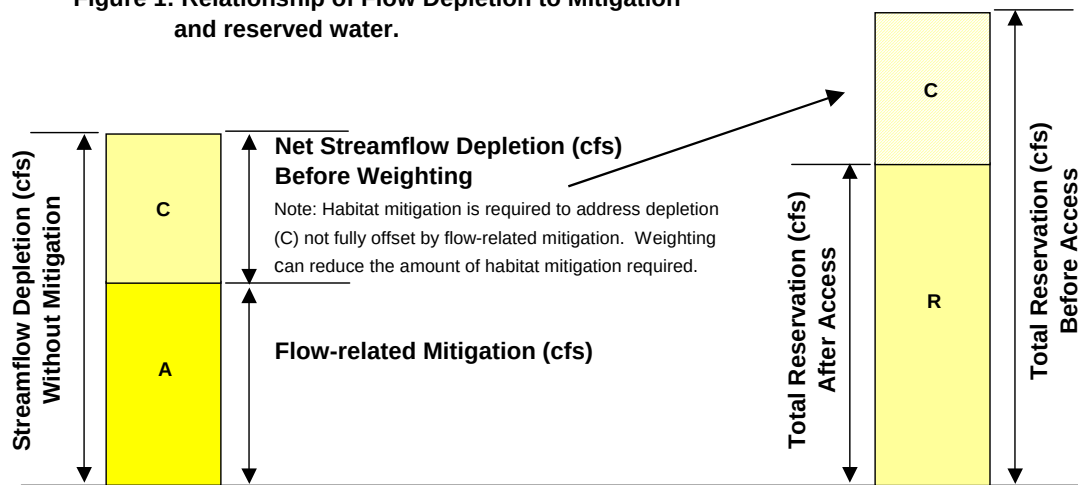
The above language is **distinct and separate from** the previous provisions relating to situations where providing the 50% flow mitigation is not practicable. Given the separation of this discussion from the previous bullet, and the reference to actions that cannot be practicably offset through water-for-water actions, this establishes that habitat actions such as wetland and side-channel restoration can be used to address residual impacts associated with the “Net Stream Flow Depletion Allowance After Mitigation” column in Table H-2 and H-2a.

- “The Planning Unit recommends that Ecology consider habitat restoration actions other than the restoration of wetlands and side-channels using the following criteria:
 - ◆ habitat actions should focus upon projects that improve stream conditions impaired by flow (e.g., projects that improve width to depth relationships or improve landscape-level hydrologic processes, etc.);
 - ◆ habitat actions should address threats and limiting factors through priority actions identified in the Lower Columbia Salmon Recovery Plan;

- ◆ habitat actions should be evaluated within the context of when baseflow impacts will occur and the expected timeframe of habitat project benefits. (Section 3.3.1, Pg 3-1; Appendix H, Pg H-7);

This language is also separate and distinct from the previous two bullets, is not associated with a specific step in the mitigation process, and establishes that habitat actions focusing on improving conditions impaired by flow or addressing priority habitat limiting factors can be used to off-set stream impacts. This category can therefore also be used to address impacts associated with the “Net Stream Flow Depletion Allowance After Mitigation” column.

Figure 1: Relationship of Flow Depletion to Mitigation and reserved water.



The above graphic represents the relationship between mitigation actions, flow depletion and reservation accounting. The primary approach for mitigating streamflow depletion impacts is through flow-related actions. As described above, the Plan guidance and requirements emphasize that flow related actions must be used to the maximum extent practicable in developing an overall mitigation package. The Plan calls for use of direct water right acquisition or other flow augmenting actions as the primary means to address the “Offset/Mitigation Requirement” (Segment A), with use of habitat actions where this is not feasible. If streamflow depletion is fully mitigated through flow-related actions, the reservation would not be debited and would remain available for future access. However, if impacts are only partially offset or not offset at all through flow-related actions (Figure 1, Segment A), the remaining streamflow depletion (Figure 1, Segment C) is “debited” from the reserve. As depicted in Segment C, habitat actions will also be required to offset net streamflow depletion impacts, but will not be used to reduce the amount of “debit” from the reservation. However, additional instream flow benefits that result in up-weighting of the flow-related mitigation credits can be used to reduce the amount of habitat mitigation required to address net stream flow depletion as represented by Segment C.⁵

⁵ See Integrated Strategy for Implementing Water Right Reservations, Section 2.0 (Reservation Accounting), for a description of flow-related mitigation up-weighting.

Addressing Water Reservations in Rule:

The WRIA Plan calls for incorporation of water right reservations into State Rules. Specifically, Policy SFP-2 (Pgs 4-6 and 4-19) states the following:

“The Department of Ecology should adopt State Rules (WACs) under its Instream Resources Protection Program to restrict issuance of new water rights in WRIAs 27 and 28. In all affected streams reaches a closure should be established, but with certain exceptions as indicated below”.

In addition, the discussion of water reservations in Section 3.3.1 includes the following recommendation:

“In order to satisfy the goals associated with the establishment of closures and/or instream flows, and the goals associated with providing a secure source of water for future public water supply, it is recommended that in each basin a block of water be reserved for future public water supply that would not be subject to the closures and/or instream flows established by rules for WRIAs 27 and 28.” (Recommendation, Page 3-13)

Page 3-13 provides further guidance regarding incorporation of water reservations into state rule:

“The amount of water, the entity, and the source(s) of the water to be reserved for public supply is recommended in Appendix H (Table H-2) and should be identified in the proposed rules to be adopted by the Department of Ecology for WRIAs 27 and 28...”

The WRIA 27/28 Plan clearly calls for providing water reservations in rule, and refers to Table H-2 for further defining the content of this rule. As described above, Table H-2 defines the water reservation as “net stream flow depletion allowance after mitigation” (Pg H-17). Based on this, it is clear that the “net streamflow depletion allowance after mitigation” should be included as the “reservation” in rule. **However, there are explicit Plan provisions discussed below that will necessitate including in rule exceptions to this definition.**

The procedure described in Section 3.3.1 and Appendix H recognizes that “...there may be occasional exceptions where offsetting one half of the predicted stream flow depletion fully or in part may be infeasible or cost-prohibitive”. The Kalama River and Upper North Fork Lewis River subbasins were called out as examples of where this situation is thought to exist. The Plan further states:

“In these limited cases, acquisition of offsetting active water rights or flow augmentation actions shall be implemented to the extent feasible. Any remaining offset requirement shall be mitigated through other habitat actions designed to offset the effects of the stream flow depletion not being offset. In no case shall the amount of stream flow depletion from new water rights issued under this policy exceed the quantity shown in Table H-2a, under the column heading “Net Stream flow Depletion Allowance.” (Section

3.3.1, Pg 3-12; Appendix H, Section IV, Pg H-6))

Where these exceptions were thought to exist, the “net stream flow depletion allowance after mitigation” column in Tables ES-3, 4-4, H-2 and H-2a, identify the same quantity as the “stream depletion without mitigation” column in Table H-2a. However, the Plan recognizes that other situations may exist, and the intent is to allow mitigation of impacts through a combination of flow actions (to extent feasible), and other habitat actions. If the “net stream flow depletion after mitigation” quantity was calculated assuming a 50% flow offset was possible, but in practice it was not, an applicant would only be entitled to secure 50% of their needed water supply and would not be allowed secure the remainder through mitigation because of the following limitation:

“In no case shall the amount of stream flow depletion from new water rights issued under this policy exceed the quantity shown in Table H-2a, under the column heading “Net Stream flow Depletion Allowance”.

The potential result would be inequitable treatment of entities under the Plan and inconsistent application of mitigation provisions. Given that water reservations are defined in the Plan as “the net stream flow depletion after mitigation” as concluded above, it will be important to clearly address the exception in rule. This could be accomplished by including the following in the rule language:

- Footnoting the water reservation tables to refer to the discussion regarding exceptions (Sections 3.3.1 and Appendix H);
- Including Sections 3.3.1 (Pg 3-11 through 3- 13) and Appendix H - Section IV (Pgs H-6 through H-8); and
- Including both Tables H-2 and H-2a as part of the “reservation strategy”, to explicitly describe the sequential relationship between reservations and mitigation and the intent of each column heading, and to ensure that an applicant’s ability to secure use of the reservation through mitigation is not precluded.

Attachments: Attachment 1 – Table H
Attachment 2 – Table H-2a

Table H-2	
Water Right Reservation Summary for WRIAs 27/28	
Water User ⁽¹⁾	Net Stream flow Depletion Allowance After Mitigation (cfs) ⁽²⁾
<i>Kalama River Subbasin</i>⁽⁵⁾	
Kalama	1.92
Small Systems and Domestic Wells	0.35
Subbasin Total	2.26
<i>North Fork Lewis Subbasin</i>	
Cowlitz County Portion	
Small Systems and Domestic Wells	0.26
Clark County Portion	
Small Systems and Domestic Wells	0.49
Skamania County Portion	
Domestic Wells	0.40
Small Systems	0.40
Commercial	0.21 ⁽⁶⁾
Subbasin Total	1.76
<i>East Fork Lewis Subbasin</i>⁽⁵⁾	
Clark County Portion	
CPU, Battle Ground, and Ridgefield ⁽⁴⁾	2.20
Small Systems and Domestic Wells	0.66
Skamania County Portion	
Small Systems and Domestic Wells	0.00
Subbasin Total	2.85
<i>Salmon Creek Subbasin</i>	
CPU, Battle Ground, and Ridgefield ⁽⁴⁾	0.13
Small Systems and Domestic Wells	0.12
Subbasin Total	0.24
<i>Burnt Bridge Creek Subbasin</i>	
Vancouver	0.02
Small Systems and Domestic Wells	0.00
Subbasin Total	0.02
<i>Lacamas Creek Subbasin</i>	
Camas	0.50
CPU	0.30
Small Systems and Domestic Wells	0.36
Subbasin Total	1.16
<i>Washougal River Subbasin</i>⁽⁵⁾	
Clark County Portion	
Washougal	0.00 ⁽³⁾
Small Systems and Domestic Wells	0.36
Skamania County Portion	
Small Systems and Domestic Wells	0.74 ⁽⁷⁾
Subbasin Total	1.10
<i>Columbia River Tributaries Subbasin</i>	
Clark County Portion	
Small Systems and Domestic Wells	0.22
Skamania County Portion	
Small Systems and Domestic Wells	0.22
Subbasin Total	0.44

Notes:

⁽¹⁾ Categories of water users include:

Large Public Water Systems, which are listed individually.

Small Systems, which refers to Public Water Systems not listed individually and required to apply for a water rights permit.

Domestic Wells, including those serving multiple homes but exempt from the requirement to apply for a water right permit.

Other Beneficial Uses, such as self-supplied industrial uses.

⁽²⁾ Calculated based upon an estimate of additional water rights needed to meet water demands through 2020. Incorporates the effects of offsetting and mitigation activities. The allowance applies only to mainstem flows; it is not intended to allow for extensive dewatering of smaller water bodies.

⁽³⁾ Current water rights are sufficient to meet needs through year 2020. Therefore no reservation is established.

- (4) Wells serving CPU, Battle Ground, and Ridgefield may draw partly from the East Fork Lewis River Subbasin and partly from the Salmon Creek Subbasin. Therefore, the stream flow depletion is split between these subbasins, based on information provided by CPU.
- (5) In the lower reaches of this subbasin, there may be opportunity to increase reservation amounts, pending further study to refine understanding of flow impacts.
- (6) Withdrawal impacts shall be limited to the mainstem North Fork Lewis River above Swift Reservoir only.
- (7) During future plan review, the size of this reservation will be reconsidered in light of Skamania County's request for 1.15 cfs needed to accommodate approximately 3109 homes.

Table H-2a
Water Right Reservation Calculations for WRIAs 27/28

	Anticipated Needs ⁽¹⁾			Stream flow Depletion Without Mitigation (cfs) ⁽³⁾	Offset/ Mitigation Requirement (cfs) ⁽⁴⁾	Net Stream flow Depletion After Mitigation (cfs) ⁽⁵⁾
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)			
<i>Kalama River Subbasin</i>⁽⁹⁾						
Kalama	NA	290	3.83	1.92	0.00	1.92
Small Community Water Systems - Cowlitz Co.	1	100	0.37	0.37	0.19	0.19
Domestic Wells - Cowlitz Co.	NA	141	0.52	0.16	0.00	0.16
Subbasin Total						2.26
<i>North Fork Lewis River Subbasin</i>						
Small Community Water Systems - Cowlitz Co.	1	100	0.37	0.37	0.19	0.19
Small Community Water Systems - Clark Co.	2	200	0.75	0.75	0.37	0.37
Small Community Water Systems - Skamania Co. ⁽¹⁰⁾	NA	NA	NA	0.40	0.00	0.40
Domestic Wells - Cowlitz Co.	NA	61	0.22	0.07	0.00	0.07
Domestic Wells - Clark Co.	NA	105	0.39	0.12	0.00	0.12
Domestic Wells - Skamania Co. ⁽¹⁰⁾	NA	NA	NA	0.40	0.00	0.40
Commercial - Skamania County ^{(10) (12)}	NA	NA	NA	0.21	0.00	0.21
Ridgefield	(Not applicable, due to location in tidally influenced area. ⁽⁸⁾)					
Subbasin Total						1.76
<i>East Fork Lewis River Subbasin</i>⁽⁹⁾						
CPU, Battle Ground and Ridgefield ⁽⁶⁾	NA	5,000	15.00	4.40	2.20	2.20
Small Community Water Systems - Clark Co.	1	100	0.37	0.37	0.19	0.19
Small Community Water Systems - Skamania Co.	0	0	0.00	0.00	0.00	0.00
Domestic Wells - Clark Co.	NA	421	1.55	0.47	0.00	0.47
Domestic Wells - Skamania Co.	NA	15	0.05	0.02	0.00	TBD
Subbasin Total						2.85
<i>Salmon Creek Subbasin</i>						
CPU, Battle Ground and Ridgefield ⁽⁶⁾	NA	1,050	2.45	0.25	0.13	0.13
Small Community Water Systems - Clark Co.	0	0	0.00	0.00	0.00	0.00
Domestic Wells - Clark Co.	NA	105	0.39	0.12	0.00	0.12
Subbasin Total						0.24

Table H-2a (cont.) Water Right Reservation Calculations for WRIAs 27/28						
	Anticipated Needs ⁽¹⁾			Stream flow Depletion Without Mitigation (cfs) ⁽³⁾	Offset/ Mitigation Requirement (cfs) ⁽⁴⁾	Net Stream flow Depletion After Mitigation (cfs) ⁽⁵⁾
	No. of "Blocks" ⁽²⁾	Qa (afy)	Qi (cfs)			
Burnt Bridge Creek Subbasin						
Vancouver						0.02
Small Community Water Systems - Clark Co.	0	0	0.00	0.00	0.00	0.00
Domestic Wells - Clark Co.	NA	NA	NA	0.00	0.00	0.00
Subbasin Total						0.02
Lacamas Creek Subbasin						
Camas ⁽⁷⁾	NA	3,240	6.01	1.00	0.50	0.50
Clark Public Utilities (CPU)	NA	1,973	3.63	0.60	0.30	0.30
Small Community Water Systems - Clark Co.	1	100	0.37	0.37	0.19	0.19
Domestic Wells - Clark Co.	NA	158	0.58	0.17	0.00	0.17
Subbasin Total						1.16
Washougal River Subbasin⁽⁹⁾						
Washougal	NA	0	0.00	0.00	0.00	0.00
Small Community Water Systems - Clark Co.	1	100	0.37	0.37	0.19	0.19
Small Community Water Systems - Skamania Co. ⁽¹⁰⁾⁽¹¹⁾	NA	NA	NA	0.20	0.10	0.10
Domestic Wells - Clark Co.	NA	158	0.58	0.17	0.00	0.17
Domestic Wells - Skamania Co. ⁽¹⁰⁾⁽¹¹⁾	NA	NA	NA	0.64	0.00	0.64
Subbasin Total						1.10
Columbia River Tributaries Subbasin						
Small Community Water Systems - Clark Co.	0.55	55	0.21	0.21	0.10	0.10
Small Community Water Systems - Skamania Co.	0.55	55	0.21	0.21	0.10	0.10
Domestic Wells - Clark Co.	NA	105	0.39	0.12	0.00	0.12
Domestic Wells - Skamania Co.	NA	25	0.08	0.12	0.00	0.12
Subbasin Total						0.44

Table H-2a (cont.)
Water Right Reservation Calculations for WRIs 27/28

	Anticipated Needs ⁽¹⁾			Stream flow Depletion Without Mitigation (cfs) ⁽³⁾	Offset/ Mitigation Requirement (cfs) ⁽⁴⁾	Net Stream flow Depletion After Mitigation (cfs) ⁽⁵⁾
	No. of "Block s" ⁽²⁾	Qa (afy)	Qi (cfs)			
<i>Burnt Bridge Creek Subbasin</i>						
Vancouver						0.02
Small Community Water Systems - Clark Co.	0	0	0.00	0.00	0.00	0.00
Domestic Wells - Clark Co.	NA	NA	NA	0.00	0.00	0.00
Subbasin Total						0.02
<i>Lacamas Creek Subbasin</i>						
Camas ⁽⁷⁾	NA	3,240	6.01	1.00	0.50	0.50
Clark Public Utilities (CPU)	NA	1,973	3.63	0.60	0.30	0.30
Small Community Water Systems - Clark Co.	1	100	0.37	0.37	0.19	0.19
Domestic Wells - Clark Co.	NA	158	0.58	0.17	0.00	0.17
Subbasin Total						1.16
<i>Washougal River Subbasin⁽⁹⁾</i>						
Washougal	NA	0	0.00	0.00	0.00	0.00
Small Community Water Systems - Clark Co.	1	100	0.37	0.37	0.19	0.19
Small Community Water Systems - Skamania Co. ⁽¹⁰⁾⁽¹¹⁾	NA	NA	NA	0.20	0.10	0.10
Domestic Wells - Clark Co.	NA	158	0.58	0.17	0.00	0.17
Domestic Wells - Skamania Co. ⁽¹⁰⁾⁽¹¹⁾	NA	NA	NA	0.64	0.00	0.64
Subbasin Total						1.10
<i>Columbia River Tributaries Subbasin</i>						
Small Community Water Systems - Clark Co.	0.55	55	0.21	0.21	0.10	0.10
Small Community Water Systems - Skamania Co.	0.55	55	0.21	0.21	0.10	0.10
Domestic Wells - Clark Co.	NA	105	0.39	0.12	0.00	0.12
Domestic Wells - Skamania Co.	NA	25	0.08	0.12	0.00	0.12
Subbasin Total						0.44

Notes:

Qa = Annual Allotment; Qi = Instantaneous Quantity; afy = acre-feet per year; cfs = cubic feet per second; NA = Not Applicable

(1) Anticipated needs are calculated in the following ways for three different types of water users:

Large Public Water Systems - Needs are based upon deficiencies in existing water rights to meet water demand growth projected to 2020 (except Kalama - 50 year need was used).

Small Community Water Systems - Needs are noted in terms of "blocks" of water. The number of blocks assigned to each subbasin is based upon the general likelihood of future water demand growth by these types of consumers in that area (e.g., there will likely be more such growth in the Washougal River Subbasin than in the Burnt Bridge Creek Subbasin, due to the ability of larger purveyors to meet future needs in the latter.)

Domestic Wells - Needs are based upon estimated growth in the number of domestic wells by 2020.

(2) "1 "block"" = 100 afy water right on a Qa basis (or approx. 90,000 gallons per day on an average day basis)

= 0.37 cfs water right, on a Qi basis (assuming a maximum day:average day peaking factor of 2.0, and an instantaneous:maximum day peaking factor of 1.33)"

- (3) The Stream flow Depletion without Mitigation refers to the total amount of stream flow reduction that would occur within the subbasin as a result of pumping or diversion, if there were no mitigation offset. In some cases, this quantity is equal to the anticipated need (Qi). In other cases, this quantity is lower, recognizing that a portion or all of the need may be met using groundwater supplies. In these cases, the impacts to streams may be lower than the amount of water withdrawn from the aquifer. For domestic wells, the depletion amount is calculated as 30% of the anticipated need, taking into account that an estimated 70% of water pumped from such wells is returned to stream flows via septic system returns.
- (4) Refers to the requirement of water users to offset 50 percent of their future water uses that are guaranteed within the context of this reservation. Does not apply to Domestic Wells.
- (5) Calculated as the Stream flow Depletion minus the Offset/Mitigation Requirement. This allowance applies only to impacts upon mainstem flows; it is not intended to allow for extensive dewatering of smaller water bodies. Water right applicants must provide further evidence regarding potential impacts to smaller tributary creeks resulting from new or expanded water resource development. Allowances are to be considered available only for the category to which they are assigned. However, every 10 years, Ecology and local parties should review the status and use of the allowances and may shift allowance quantities between categories to better address needs, so long as the subbasin total allowance does not change.
- (6) Wells serving CPU, Battle Ground and Ridgefield may draw partly from the East Fork Lewis River Subbasin, and partly from the Salmon Creek Subbasin. Therefore the stream flow depletion is split between these subbasins, based on information provided by CPU.
- (7) The majority of the City of Camas is located within the Lacamas Creek Subbasin, though portions are also located within the Burnt Bridge Creek and Washougal River Subbasins. The City's water sources are located within both the Lacamas Creek and Washougal River Subbasins. Therefore, the stream flow depletion for Camas applies to both subbasins (i.e., total stream flows in both subbasins collectively are not to be reduced by more than the amount indicated for the City).
- (8) Not applicable, due to location in tidally influenced area.
- (9) In the lower reaches of this subbasin, there may be opportunity to increase reservation amounts, pending further study to refine understanding of flow impacts.
- (10) Revised water demand projections were determined during the 2005/2006 watershed plan remand process based on projected build-out in relation to current minimum lot sizes and anticipated growth needs, and are not reflected in previous assessments and growth projections.
- (11) During future plan review, the size of this reservation will be reconsidered in light of Skamania County's request for 1.15 cfs needed to accommodate approximately 3109 homes.
- (12) Withdrawal impacts shall be limited to the mainstem North Fork Lewis River above Swift Reservoir only.

Attachment C

Evaluation of Flow-Related Mitigation

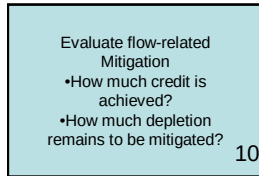


Figure 1: Box 10 from main flowchart

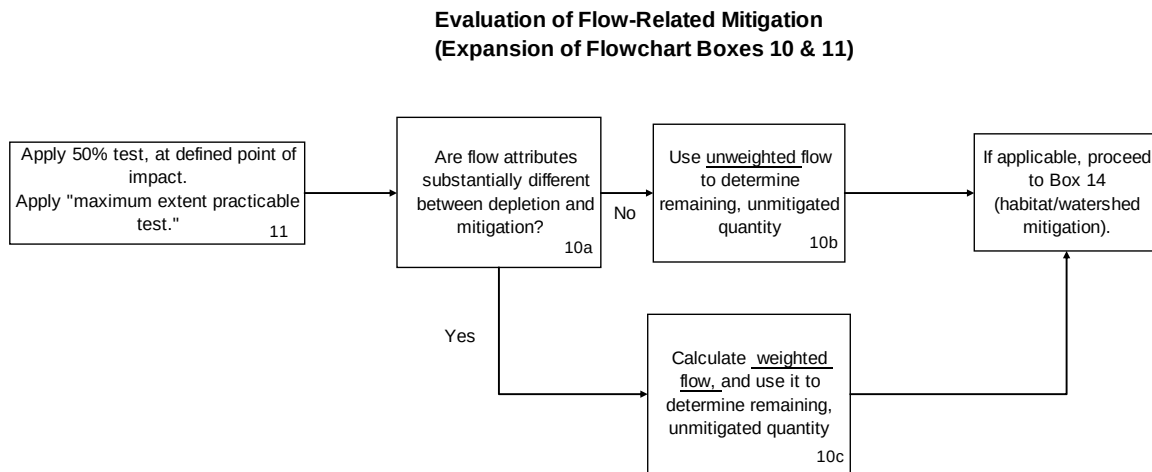


Figure 2: Expanded flowchart for Flow Related Mitigation

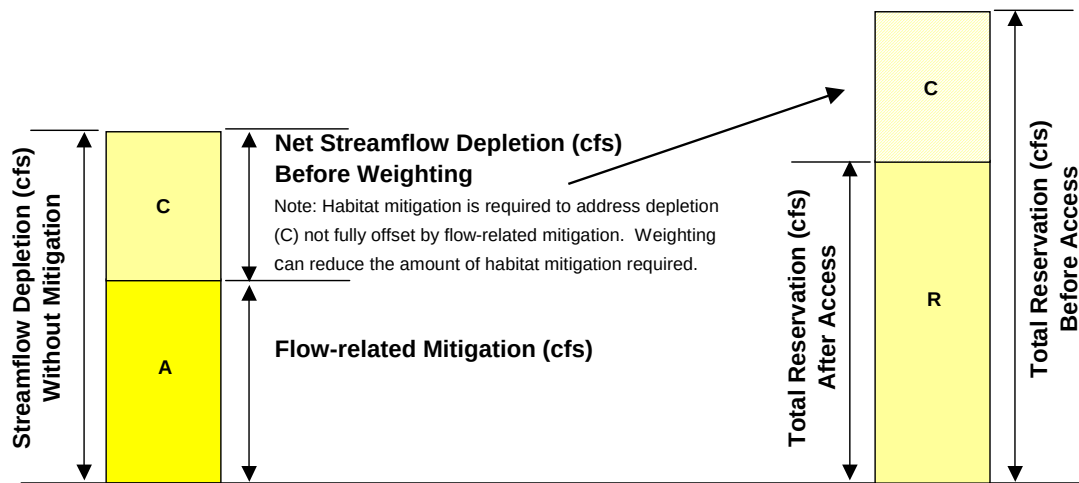
Goal:

- Create a transparent and structured process to evaluate flow-related mitigation proposals
- Enable processing of highly diverse mitigation proposals

Context:

- Applicant must mitigate at least 50% of their flow depletion with flow-related actions (unless this is infeasible or cost-prohibitive)
- Flow-related mitigation must be used “to the maximum extent practicable”
- After mitigation from flow-related actions is credited, applicants must mitigate remaining impacts through habitat/watershed actions (see Figure 3) unless this is infeasible or cost-prohibitive.

Figure 3: Relationship of Flow Depletion to Mitigation Actions



(Note: see separate discussion regarding computation of Habitat/Watershed Mitigation Credit)

Assumptions:

- Flow depletion estimates on a stream are quantified based on standard methods currently accepted by Ecology (cost to applicant is a separate discussion)
- For surface water applications, there will be a well-defined “point of diversion” on a surface water body. For ground water applications, a discrete “point of impact” on an affected water body will need to be defined, to enable the steps discussed below. In cases involving more than one pumping or withdrawal location, or variable stream flow capture along a gradient, multiple points of diversion or impact will be established
- Mitigation ordinarily must occur within the same LCFRB-defined subbasin (or for the larger river systems, a subbasin that is hydrologically part of the same larger basin). Limited exceptions may be permissible, where greater benefits can be demonstrated through mitigation in another subbasin.

Approach:

- The plans require that at least 50% of flow depletion be offset with flow-related mitigation. The 50% requirement for flow-related mitigation must be accomplished at the defined point(s) of impact or diversion. For this test, the quantity of flow will be the only metric. However, seasonality will be considered.
- The required flow-related mitigation may be provided in a location other than at the defined point of diversion or impact provided the applicant demonstrates that overall greater resource benefits would result. In these limited exceptions, a quantitative analysis similar to that described in Appendix E must demonstrate overall greater resource benefits as measured by distance (e.g., miles) of watercourse affected, quantity of flow (cfs) benefit and impact relative to baseline habitat conditions, water quality and salmon recovery reach tiering, in both the impacted and benefiting reaches.

- If an applicant cannot meet the 50% requirement, they are permitted to provide evidence to demonstrate achieving 50% using flow-related mitigation is not feasible or is cost-prohibitive (*Note: criteria for this demonstration still need to be developed*). In this case they must provide habitat/watershed mitigation instead.
- The plans also require that applicants mitigate using flow-related actions “to the maximum extent practicable.” This means that 50% is not the “ceiling” for flow-related mitigation. In cases where the depletion is not fully offset by flow-related mitigation actions, the applicant must provide a written description of efforts performed to identify feasible actions for flow restoration, and any challenges or obstacles that prevent further use of flow-related mitigation for the application in question. Consistent with the policy in the watershed plans, this explanation may include both economic and logistic considerations.
- If an applicant’s flow-related mitigation satisfies the 50% requirement but does not fully offset the impact of withdrawing water, they will be required to mitigate further, using habitat/watershed actions.” In order to determine how much mitigation remains to be accomplished, further assessment of the flow-related mitigation action is required, as described in the following steps.
 - A determination will be made whether the flow-related mitigation proposed has similar attributes to the water depleted; or significant differences. If the depletion and mitigation have similar attributes, then the weighting process does not need to be applied.
 - If the depletion and mitigation have substantially different characteristics that affect habitat or other important stream functions, then a weighting process will be applied. The weighting procedure will not affect how much is debited from the reservation. However, it can reduce the amount of habitat/watershed mitigation required. Therefore, if depletion and mitigation have different characteristics, the next step will be to select which attributes are substantially different and should therefore be used in weighting the mitigation proposal. The following attributes will be used to make this determination:
 - Mainstem/tributary relationship (if mitigation will be applied to a different part of the stream network than depletion)
 - Length of stream reaches affected, measured in river miles (to the nearest tenth of a mile)
 - LCFRB reach tiers (these represent fish presence and priority, as well as habitat importance)
 - Seasonality
 - Water quality

A spreadsheet tool has been developed to address the first three of these elements. See Attachment E for further information.

- Once the attributes to be used have been selected from this menu, the approach to weighting is:

- The attributes selected are first weighted in terms of their relative importance. This is done in the “depletion” column. The sum of depletion weights for all attributes selected must equal 100, but the individual weights may be different from each other.
 - Next, attention is given to the “mitigation” column. For each attribute, mitigation is scored relative to the depletion effect, based on simple criteria (*these have not yet been defined*). The mitigation action may receive either a higher weight or a lower weight than the depletion effect. (A mitigation weight higher than the depletion weight means the mitigation action more than offsets the depletion for that attribute; and vice versa).
 - The “relative value” of the mitigation overall is equal to mitigation weight divided by depletion weight. Credit received for mitigation is the quantity of flow produced by the mitigation action measured in cfs, multiplied by the total relative value of the mitigation action.
- o Example : Weighting Factors
(only used if depletion effect has substantially different attributes from mitigation action):

In this example, only three attributes (out of five possible) are identified as being “substantially different” between the depletion and the mitigation

Weighting Factor	Depletion Weight (normalized to 100 total)	Mitigation Weight (assessed relative to Depletion Weight)
Mainstem/trib relationship	20	40
Length of stream affected	n/a	n/a
LCFRB Tiers	60	80
Seasonality	n/a	n/a
Water Quality	20	10
Total Weight	100	130
Relative Value of Mitigation:	130/100 = 1.3	

Assume depletion quantity = 4.0 cfs and flow-related mitigation quantity = 2.0 cfs. The net depletion is 2.0 cfs and therefore the reservation will be debited by that amount. This is represented by “C” in Figure 3.

However in this example each unit of mitigation is valued higher than each unit of depletion, by a factor of 1.3

So Mitigation Credit is: $1.3 \times 2.0 \text{ cfs} = 2.6 \text{ cfs}$ The additional 0.6 cfs of mitigation credit from weighting reduces the amount of habitat mitigation that is required to address the net streamflow depletion, but does not reduce the total amount (2 cfs) deducted from the reservation.

Therefore the remaining portion not mitigated by flow-related actions is:
 $(4.0 \text{ cfs}) - (2.6 \text{ cfs}) = 1.4 \text{ cfs}$. This quantity represents the net habitat mitigation obligation.

(Note: in the table above, it may be useful to develop boundaries on how much larger or smaller mitigation weights can be, compared with depletion weights). The limit may apply on both the high side and the low side (e.g. 1/5 on the low side and 5X on the high side, or other values to be selected). This needs further consideration)

- Credit awarded for cases where the depletion and mitigation are on the same exact stream may be different than when the depletion and mitigation are on a mainstem and tributary; or on different tributaries within a sub-basin (see Figure 4). This can be handled through the weighting system discussed above. The “tributary/mainstem” attribute is intended to allow weighting based on this consideration.
- Downstream mitigation. The 50% requirement discussed above must be achieved at the point of impact of the withdrawal. However, it is recognized that some mitigation proposals may include multiple mitigation actions, and some of these may also include downstream, flow-related actions. As long as the 50% requirement is met at the point of impact, additional mitigation actions located downstream of the point of impact will also be considered, and weighted as discussed above.

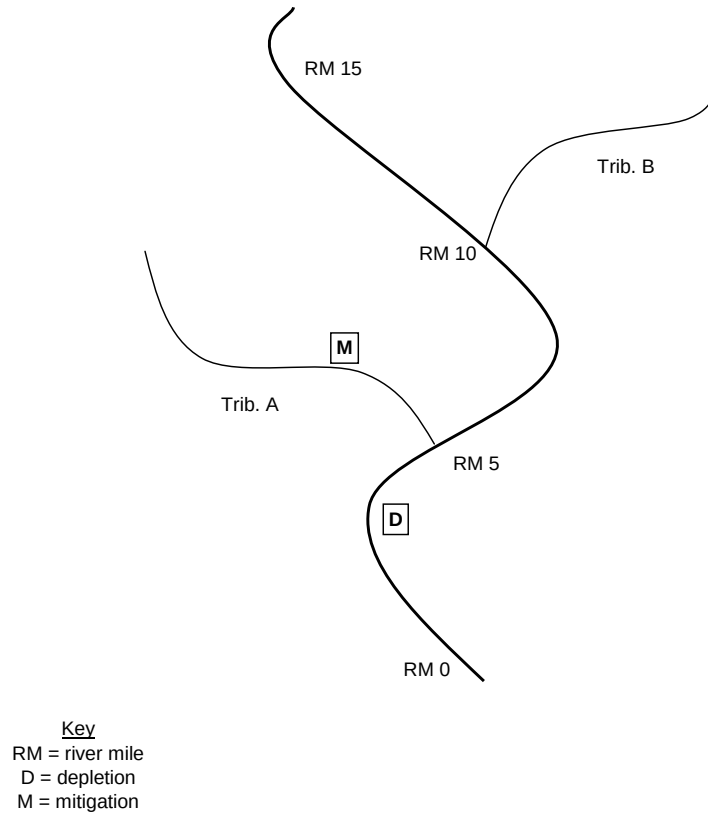


Figure 4: Hypothetical Stream (mainstem & tributaries)

Attachment D

How to Evaluate Habitat /Watershed Mitigation

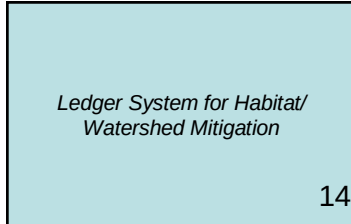


Figure 1: Box 14 from Main Flowchart

Executive Summary:

Habitat / Watershed mitigation is required in order to access an instream flow reservation when full mitigation has not been achieved via flow-related means. The goal of this requirement is to “...mitigate the effects of the stream flow depletion not being directly offset” or “address impacts that cannot be practicably off-set (no more than half) through water-for-water actions” (WRIA 25/26 Watershed Management Plan). The WRIA 25/26 and 27/28 planning units also called for habitat mitigation to address stream and river habitat more broadly, even when not directly mitigating for lost instream flow, using the following criteria.

- “habitat actions should focus upon projects that improve stream conditions impaired by flow (e.g., projects that improve width to depth relationships or improve landscape-level hydrologic processes, etc.)”
- “habitat actions should address threats and limiting factors through priority actions identified in the Lower Columbia Salmon Recovery Plan”

This section defines a transparent and structured process to evaluate watershed / habitat mitigation proposals for comparison with remaining unmitigated stream flow depletion. A point system has been developed that equates highly diverse habitat mitigation actions to a unit of stream flow depletion. In order to access the reservation, habitat “mitigation points” must equal or exceed the amount of “depletion points”. This criterion is subject to cost ceilings, as defined in section 5.0.

Depletion points are based on the magnitude of flow depletion and the river miles that will be depleted. Further weighting of depletion points is based on stream reach biological importance and sensitivity to flow depletion. Basic rules are defined in order to receive points for habitat mitigation actions.

Specific types of mitigation actions and corresponding tables of points per unit of mitigation are defined. Some mitigation point tables are based on IFIM estimates of aquatic habitat lost per incremental loss of instream flow. When mitigation actions did not have a clear relationship

with a defined area of aquatic habitat, ranges of points were defined, allowing for best professional judgment.

Habitat mitigation proposals that are not defined in this guidance document can be proposed for evaluation on any given application for reserved water. The amount of points awarded for these actions will be determined on a case-by-case basis.

Context:

- The applicant has met at least 50% of their mitigation with flow-related actions (or to the maximum extent practicable).
- The applicant must satisfy the remaining flow depletion via habitat / watershed mitigation as a threshold requirement in order to access the instream flow reservation.

Goal:

- Create a transparent and structured process to evaluate watershed / habitat mitigation proposals for comparison with remaining depletion.
- Enable processing of highly diverse mitigation proposals

Assumptions:

- A ledger approach with dimensionless points can be used as an accounting system to “credit” mitigation points against depletion “debit” points (Table 1).
- Streamflow depletion that remains un-mitigated after “flow-related” mitigation can be equated to “depletion points”.
- The sum total of “mitigation points” must equal or exceed the “depletion points” in order to access the instream flow reservation.
- A variety of habitat / watershed related mitigation actions can be completed to accrue mitigation points.

I. Ledger System: Scoring Flow Depletion (impacts):

- Convert remaining flow depletion to dimensionless points using the following three factors:
 - Remaining unmitigated flow depletion- a unit of flow depletion is 0.1 cfs per river mile. River miles used in the impact calculation are only those that are 1) projected to be depleted by the water rights application, and 2) closed to conventional water rights applications.
 - If instream flow is considered limiting to fish production at the reach-scale relative to other habitat factors, then additional stream depletion must be accompanied by twice the habitat mitigation. The doubling the mitigation requirements is intended as a disincentive in order to avoid flow depletion impacts in waterbodies that are already limited by flow. Instream flow as a limiting factor is defined in terms of a “high” ranking in the LCFRB Habitat Work Schedule (HWS) Multi-Species Project Benefits matrix (Appendix A).
 - Reach Importance to fish recovery, according to the Habitat Work Schedule “Reach Tier”. The interpretation of the reach tiers follows directly from the 2007 LCFRB Habitat Work Schedule Evaluation Criteria (Appendix A). The relative

proportion of depletion points follows from the LCFRB (2007) project evaluation and scoring process (The Habitat Work Schedule Evaluation Criteria are used to prioritize restoration proposals for funding.)

Convert remaining flow depletion to depletion points

	Reach Importance to Fish Recovery		
	Tier 1	Tier 2	Tier 3-4
	Depletion Points per 0.1 cfs-mile		
For depletion of surface waters where Instream flows is not an ecological limiting factor (i.e. medium or low project benefit on the Habitat Work Schedule).	5	3	1
For depletion of surface waters where Instream flow is an ecological limiting factor (i.e. high project benefit on the habitat work schedule)	10	6	2

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream (left column) that is flow limited (bottom row). Therefore, every river mile that is depleted by 0.1 cfs will accrue 10 depletion points. Since 3 river miles were affected (x3) and 0.2 cfs were depleted (x2), 60 mitigation points will be required to access the water reservation. This impact scenario will be used in mitigation examples that follow in this document.

II. Ledger System: Scoring Mitigation Actions for Comparison Against Depletion:

A. Background Information on Scoring Habitat/Watershed Mitigation Actions

- Basic rules for habitat / watershed mitigation proposals.
 - The mitigation actions must be for actions that are not already mandated to occur (e.g. culverts, critical areas protection, etc.)
 - Mitigation should normally occur in the same sub-basin as the flow depletion. However, in limited cases mitigation may be completed in another sub-basin if the applicant can demonstrate a substantially greater resource benefit will result.
 - Mitigation actions should be done in reaches where the related Habitat Work Schedule factor (Appendix A) is limiting (i.e. Multi-species Project Benefit = High or Medium)
 - Mitigation projects and actions should be developed and implemented using best available science and have a high long-term likelihood of success. Specific performance goals and measures (e.g. success rates, duration, desired future conditions, etc.) will be associated with each mitigation action and mutually agreed upon by the applicant and Ecology.
 - Mitigation projects may have a maintenance component, but must have a preservation component (e.g. transfer of development rights; public ownership, conservation covenant).

- In cases where multiple parties contribute to a project, the water right applicant only receives credit proportional to their contribution.
- Approaches to scale habitat / watershed mitigation value to streamflow depletion.
 - For each of these five categories, a simple scoring system has been developed. The value of mitigation within each category is generally defined by 1) the importance of the mitigation reach to fish recovery, and 2) the specific kind of mitigation action proposed. Mitigation actions were delineated as separate rows in the table if they had unique value, in terms of fish habitat recovery. If scoring across rows was defined by reach tiers, then the amount of points awarded is proportional to the LCFRB Habitat Work Schedule scoring criteria.
 - Since this framework includes a variety of mitigation actions, the value of mitigation between each category and flow depletion was determined using different rationale and methods.

Rationale for Scoring Different Types of Habitat/Watershed Mitigation Actions

	Mitigation Actions	Rationale	Processes and Functions Associated with Mitigation Actions	Mitigates Reduction in Aquatic Habitat	Mitigates Hydrologic Impacts	Method for Determining Value Relative to Flow Reduction
1	Side Channel/ Off-Channel Habitat Restoration (per acre)	Increase the quantity of aquatic habitat	Refugia; spawning habitat; invertebrate production; over-wintering habitat	X		IFIM modeled relationship between streamflow and In-channel Habitat
2	In-Channel Improvements (per 100 sq. ft)	Increase utilization of "downstream" aquatic habitat by increasing habitat quality	Refugia; wood and gravel recruitment; sediment sorting; bedform diversity; bed material retention	X		IFIM modeled relationship between streamflow and In-channel Habitat
3	Wetland Restoration (per acre)	Some wetlands can attenuate transport of upslope stormwater to streams; store water from high-flow events; and / or contribute to baseflows	Maintenance of stream low-flow ; Attenuation of stormwater impacts; wetland water quality function; wetland habitat function		X	Best Professional Judgment
4	Floodplain Re-connection (per acre)	Levee removal or setback allows for increased utilization of floodplain and increased water storage for low flow maintenance	Channel stability; sediment sorting; floodplain connectivity /storage; bedform diversity; hydraulic diversity; nutrient input; refugia		X	Best Professional Judgment
5	Riparian Preservation and Restoration (per acre)	Riparian vegetation attenuates transport of water from watershed to channel and improves habitat conditions in the stream.	Shading; Bank stability; width/ depth; pollutant filtering; flow retention; erosion control; large woody debris input; refugia; channel roughness; leaf litter inputs; floodplain roughness		X	Best Professional Judgment
6	Other Mitigation Actions	Applicants may propose other types of habitat / watershed mitigation. Those proposals will be evaluated on a case-by-case basis	Variable	Variable	Variable	Best Professional Judgment

Instream Flow Incremental methodology (IFIM) modeled relationship between streamflow and usable aquatic habitat:

This IFIM approach is being applied to two in-channel mitigation actions 1) side channel/ off-channel habitat restoration and 2) in-channel improvements mitigation.

The value of in-channel mitigation actions can be quantified in terms of the usable aquatic habitat that is created or restored. The usable aquatic habitat created or restored can then be related to incremental flow loss via IFIM modeling results that relate changes to Weighted Usable Area (i.e. In-channel habitat) to In-channel flow. IFIM modeling studies have been completed in the East Fork Lewis, Kalama, and Washougal Rivers. In each study, we examined the modeled relationship between Weighted Usable Area and flow at the same low flows defined to make the water reservations (Appendix A). Based on the IFIM curves within the range of typical low flows, an average of 6.6 sq. feet of Weighted Usable Area per 1000 ft of stream length is predicted to be lost from an incremental loss of 0.1 cfs (Appendix A)

In this point system, streamflow depletion is defined in terms of 0.1 cfs per river mile. Since the depletion points are accrued in terms of river miles, the basis for mitigation scoring must be related to river miles. A loss of 6.6 sq. ft lost per 1000 ft of stream equals 34.85 sq. ft Weighted Usable Area lost per river mile. Therefore, 34.85 sq. ft is the effective “impact” of 0.1 cfs streamflow depletion per river mile. This is the value of one point for both depletion and mitigation.

The mitigation actions involving aquatic habitat creation or restoration are expressed in terms of 100 sq. ft created or restored. Therefore, since 34.85 sq. ft is equal to one point, for each 100 sq. ft of aquatic habitat created or restored, 3 points are awarded.

0.1 cfs reduction = 6.6 sq. ft Weighted Usable Area lost per 1000 feet of stream (IFIM studies)

1 mile = 5280 ft 5280 ft / 1000 ft = 5.28

6.6 sq. ft * 5.28 = 34.85sq. ft. Weighted Usable Area lost per river mile, per 0.1 cfs reduction in flow

This estimate is a generalization from the IFIM modeling results and not a quantitative extrapolation of the modeling results. Nevertheless, it provides a useful basis for assigning points to mitigation actions that create or improve in-channel habitat (i.e. weighted usable area), relative to loss of in-stream flow in large rivers.

Since the IFIM modeling results do not address smaller streams and rivers, this relationship between flow and habitat loss may not apply. In order to protect smaller streams, the amount of mitigation points awarded for instream mitigation is subject to change on a case-by-case basis. Future development of these mitigation guidelines will utilize other IFIM results to 1) consider

the use of % reduction in Weighted Usable Area as a function of flow, and 2) see if the ratio is constant or if it changes with channel size.

B. Scoring Tables for Habitat/Watershed Mitigation Actions

Side Channel/ Off-Channel Habitat Restoration

- A proposal for off-Channel Habitat Restoration must be justified and deemed appropriate in reach-scale and watershed-scale analyses. The Habitat Work Schedule result is from a watershed analysis.
- A detailed reach and site-scale assessment is required to determine potential benefits and risks (hydrology change could affect upstream or downstream bank stability / erosion). Potential benefits include fish access / refugia and increasing the hydrological connection with the floodplain. Newly created or restored side-channel habitat must be established successfully, but is not necessarily expected to persist into perpetuity, given the dynamic nature of channel-forming processes.
- In-channel Large Woody Debris and riparian restoration must accompany any new habitat reconnected or created.
- Requires permitting, maintenance, and monitoring

Scoring Considerations

- Base scoring is defined by the relationship between streamflow and In-channel habitat from IFIM.
- Scoring across columns reflects reach importance to fish recovery. Proportional increases in points awarded follows proportion of points awarded in LCFRB Habitat Work Schedule Evaluation Criteria.

Scoring matrix for Side Channel / Off-Channel habitat mitigation actions. Side Channel/ Off-Channel Habitat Restoration	Reach Importance to Fish Recovery		
	Tier 1	Tier 2	Tier 3-4
	Mitigation Points		
Creation or restoration of functional side-channel (100 sq. ft)	15	9	3

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream that is flow limited. Therefore, 60 mitigation points will be required to access the water reservation. In this scenario, the following examples of mitigation actions would meet this requirement:

- Creation or restoration of 400 sq. ft of functional side-channel in a tier 1 reach
- Creation or restoration of 667 sq. ft of functional side-channel in a tier 2 reach
- Creation or restoration of 2000 sq. ft of functional side-channel in a tier 3-4 reach

Note: For all scenarios, a change in miles of depleted stream flow would drive mitigation requirements up or down.

In-channel improvements

- Goal is to improve instream conditions (e.g. improved pool habitat, sub-surface [hyporheic] flows, hiding cover, width to depth ratios, temperatures, etc.)
- Methods can be variable (e.g. in-stream structures include engineered large woody debris jams, boulder clusters, drop structures and porous weirs.)
- Commonly done as a means of improving in-channel habitat for fish and are meant to be analogs to otherwise naturally occurring features.
- Correct design and installation is critical to avoiding unintended degradation of stream habitat and processes.
- Needs to address causes of habitat problems, not symptoms
- A proposal for channel restoration using instream structures must be justified and deemed appropriate in site-scale, reach-scale and watershed-scale assessments. A detailed reach and site-scale assessment is required to determine potential benefits and risks. The Habitat Work Schedule limiting factor and reach tier results are from a watershed assessment.
- Requires permitting, maintenance, and monitoring.

Scoring Considerations

- Base scoring is defined by IFIM modeled relationship between streamflow and in-channel habitat.
- Scoring across columns reflects reach importance to fish recovery. Proportional increases in points awarded follows proportion of points awarded in LCFRB Habitat Work Schedule Evaluation Criteria.
- Instream structures are intended to improve existing aquatic habitat, and therefore make it more usable for salmonids. No additional aquatic habitat is being created. The mitigation plan must clearly indicate and justify how much area of salmonid habitat is being made more usable.

Scoring matrix for Instream Condition mitigation. In-channel improvements	Reach Importance to Fish Recovery		
	Tier 1	Tier 2	Tier 3-4
	Mitigation Points		
Restoration of functional aquatic habitat using Instream Structures; per 100 sq. ft	15	9	3

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream that is flow limited. Therefore, 60 mitigation points will be required to access the water reservation. In this scenario, the following examples of mitigation actions would meet this requirement:

- Restoration of 400 sq. ft. of fish habitat in a tier 1 reach
- Restoration of 667 sq. ft. of fish habitat in a tier 2 reach
- Restoration of 2000 sq. ft. of fish habitat in a tier 3-4 reach

Wetland Restoration

- Mitigation is subject to Army Corps / Ecology guidance and permitting requirements

- The wetland must have a demonstrated surface or hyporheic (subsurface) connection to a stream.

Scoring Considerations-

- Wetland restoration, creation, and enhancement will improve different ecological functions depending on its position in the watershed, and the hydrological connectivity with rivers and streams.
- In general, restoration gets more credit than creation because restoring wetland functions in a historical wetland has a higher likelihood of success.
- Enhancement of the restored or created wetland is commonly done, and adds some value. An example of enhancement includes noxious weed control and re-vegetation with appropriate native wetland plants.
- The following potential benefits can be used to determine the case-by-case point value:
 - Maintenance of stream hydrology in low-flow conditions
 - Attenuation of stormwater impacts to receiving waters, such as a stream
 - Improvement in water quality function
 - Improvement in habitat function

Scoring matrix for wetland mitigation actions.

Per Acre	Mitigation Points per acre
Restoration (re-establishment or rehabilitation)	15-20
Creation (establishment)	10-15
Enhancement	5-10

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream that is flow limited. Therefore, 60 mitigation points will be required to access the water reservation. In this scenario, the following examples of mitigation actions would meet this requirement:

- 3 to 4 acres of wetland restoration (depending on judgments regarding value)
- 4 to 6 acres of wetland creation
- 6 to 12 acres of wetland enhancement (can be used in combination with restoration and creation).

Floodplain Reconnection

- A proposal for levee\structure removal or modification must be justified and deemed appropriate in reach-scale and watershed-scale analyses. The Habitat Work Schedule result is from a watershed analysis.
- A detailed reach and site-scale assessment is required to determine potential benefits and risks.
- Requires riparian restoration.
- Requires permitting, maintenance, and monitoring.

Scoring Considerations

- Scoring across columns reflects reach importance to fish recovery. Proportional increases in points awarded follow from the LCFRB Habitat Work Schedule Evaluation Criteria.
- The following potential benefits can be used to determine the case-by-case point value:
 - Habitat Restoration
 - Erosion reduction
 - Water quality improvements
 - Groundwater recharge
 - Restoring wildlife migration corridors
 - Reduction of flood-hazard risk

Scoring matrix for Floodplain Re-connection actions. Floodplain Utilization	Reach Importance to Fish Recovery		
	Tier 1	Tier 2	Tier 3-4
	Mitigation Points		
Reconnection of floodplain via levee setback or removal (per acre)	3-7	2-6	1-3

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream that is flow limited. Therefore, 60 mitigation points will be required to access the water reservation. In this scenario, the following examples of mitigation actions would meet this requirement:

- 9 to 20 acres of floodplain reconnection associated with a tier 1 river
- 10 to 30 acres of floodplain reconnection associated with a tier 2 river
- 20 to 60 acres of floodplain reconnection associated with a tier 3 or 4 river

Riparian Restoration

- Preservation can only be done by itself if the riparian habitat is of high quality and is at risk. “At risk” is defined by 1) not protected under a local critical areas or other land use ordinance, and 2) a demonstrated likelihood of future conversion of that habitat to another use.
- Low quality habitat requires restoration and preservation; more points are awarded for restoration and preservation. A “low quality riparian habitat” that has restoration potential must be defined by the applicant and verified by Ecology and / or WDFW.

- o More points are awarded for work done in reaches that are of higher priority to fish (defined by Habitat Work Schedule reach tier).
- o Riparian zone is defined as land within the Site-Potential Tree Height of the stream bank
- o “High Quality” riparian habitat must be verified by WDFW. However, a definition follows from the WDFW “Management Recommendations for Washington’s Priority Habitats: Riparian” definition of “intact” riparian vegetation. Some elements of this definition include:
 - a mixture of coniferous and deciduous trees;
 - a high degree of structural diversity (multiple canopy layers, a well-developed shrub layer, and variability in tree age, shape, and species);
 - high density and diversity of wildlife and plant species;
- o Headwater streams are generally first or second order streams less than 5-10 feet in bankfull width (Oregon Headwaters Research Cooperative 2001).

Scoring Considerations

- Scoring across columns reflects reach importance to fish recovery. Proportional increases in points awarded follows proportion of points awarded in LCFRB Habitat Work Schedule Evaluation Criteria.
- Overall scoring reflects the expected indirect benefit to in-channel habitat that would mitigate for incremental flow reduction. Restoration and preservation riparian habitat primarily supports in-channel habitat forming processes, but does not directly compensate for loss in hydrological function. Therefore, there is no suitable quantitative relationship between this mitigation action and flow depletion. However, the indirect benefits of riparian function to stream habitat are well defined and accepted. Therefore, it is valid to promote the restoration and preservation of riparian habitat as a mitigation option. Scoring reflects the expected indirect benefit to streams per incremental flow reduction.

Scoring matrix for riparian mitigation actions.

Points per acre of riparian habitat	Reach Importance to Fish Recovery		
	Tier 1	Tier 2	Tier 3-4
	Mitigation Points		
Preservation of high quality riparian habitat	4-6	3-5	1.5-3
Restoration and Preservation of low quality riparian habitat	8-12	4-6	3-5

Example: A water rights application will result in a 0.2 cfs reduction in flow in 3 miles of a tier 1 stream that is flow limited. Therefore, 60 mitigation points will be required to access the water reservation. In this scenario, the following examples of mitigation actions would meet this requirement:

- Preservation of 12-15 acres of riparian habitat associated with a tier 1 stream
- Preservation of 12-20 acres of riparian habitat associated with a tier 2 stream
- Preservation of 20-40 acres of riparian habitat associated with a tier 3-4 stream

- Restoration and preservation of 5-7.5 acres of riparian habitat associated with a tier 1 stream
- Restoration and preservation of 10-15 acres of riparian habitat associated with a tier 2 stream
- Restoration and preservation of 12-20 acres of riparian habitat associated with a tier 3-4 stream

Reference Information

Various reference documents may be useful in applying the scoring system described above. An initial list of documents includes:

Washington State Department of Fish and Wildlife, *Stream Habitat Restoration Guidelines* (SHRG)

Washington State Department of Fish and Wildlife, *Integrated Streambank Protection Guidelines* (ISPG)

Appendix A: Tables supporting table logic and definitions

An example of a Habitat Work Schedule (Habitat Work Schedule) for a portion of the Grays River sub-basin. The Reach Tiers (1-4) are used to determine the importance of the reach to fish recovery. The Multi-Species Project Benefit ratings are used for scoring, in terms of ecological limiting factors.

Stream Reaches	Species Presence and Reach Potential						Restoration v. Preservation Value		Multi-Species Project Benefits Note: project benefits are derived from conditions of limiting factors and not from field observation of site-specific project needs									
	Winter Steelhead	Summer Steelhead	Fall chinook	Spring chinook	Coho	Chum	Restoration	Preservation	Access to blocked habitats	Stream channel habitat structure & bank stability	Off channel & side channel habitat	Floodplain function and channel migration processes	Riparian conditions & functions	Water quality	Instream flows	Regulated stream mngt for habitat functions	Watershed conditions & hillslope processes	Food ²
Designation																		
Grays 2	L		H		H	H	1	50%	50%	L	H	H	H	H	H	L	H	M
Grays 2B	H		L		H	H	1	49%	51%	L	H	H	H	H	H	L	H	M
Grays 2C	M		M		H	H	1	48%	52%	L	H	H	H	H	H	L	H	M
Grays 2A	M		M		H	M	1	49%	51%	L	H	H	H	H	H	L	H	M
WF Grays 1 Lower	H		L		M	H	1	59%	41%	L	H	H	H	H	H	L	H	L
Grays 1G tidal	L		M		H	M	1	51%	49%	L	H	H	H	H	H	L	H	M
Fossil Cr Lower	M				M	H	1	78%	22%	L	H	H	H	M	H	L	H	L
Grays 2D	L				M	H	1	49%	51%	L	H	H	H	M	H	L	H	M
WF Grays 1	H				L	M	1	61%	39%	L	H	H	H	M	H	L	H	L
Klints Cr Lower	L				L	H	1	38%	62%	L	H	H	H	L	H	L	H	L
WF Grays 2	H				L	L	1	62%	38%	L	H	H	H	M	H	L	H	L
WF Grays 3	H				M		1	58%	42%	L	H	H	H	L	H	L	H	L
Beaver Cr	H				L		1	54%	46%	L	H	M	M	L	M	L	H	L
Crazy Johnson	L					H	1	15%	85%	L	H	H	H	M	L	L	M	L
Blaney Cr 1	H						1	66%	34%	L	H	H	M	M	H	L	H	L
EF Grays 1	H						1	48%	52%	L	H	H	M	M	L	L	H	L
EF Grays 3	H						1	60%	40%	L	M	M	M	M	L	M	L	L
Grays 3B ¹	H						1	77%	23%	L	H	H	M	H	M	L	H	L
Grays 4A	H						1	77%	23%	L	H	H	M	M	L	H	L	L
Grays 4B	H						1	76%	24%	L	H	H	M	M	L	H	L	L
SF Grays 1	H						1	73%	27%	L	H	H	H	H	H	L	H	L
SF Grays 2	H						1	75%	25%	L	M	M	M	M	L	H	M	L

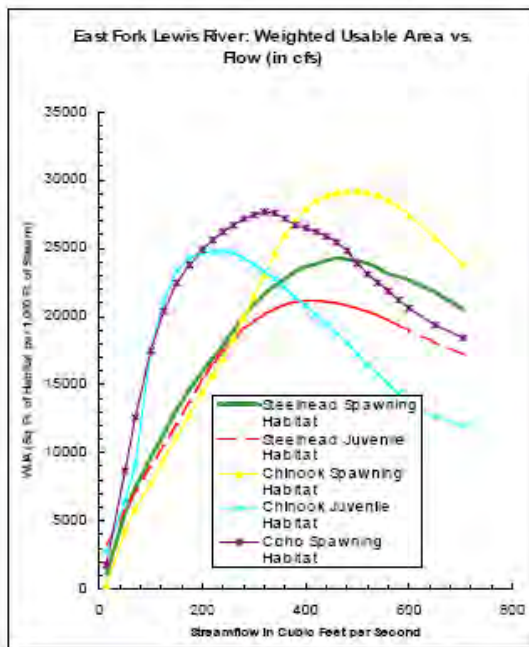
Rules for determining reach importance to fish recovery (reach tiers). The rules are from the LCFRB Habitat Work Schedule Evaluation Criteria (LCFRB 2007).

Designations Rule	
Reaches	Rule
Tier 1	All high priority reaches (based on EDT) for one or more primary populations.
Tier 2	All reaches not included in Tier 1 and which are medium priority reaches for one or more primary population and / or all high priority reaches for one or more contributing populations.
Tier 3	All reaches not included in Tiers 1 and 2 and which are medium priority reaches for contributing populations and/or high priority reaches for stabilizing populations.
Tier 4	Reaches not included in Tiers 1, 2, and 3 and which are medium priority reaches for stabilizing populations and / or low priority reaches for all populations.

Mitigation actions and their relation to Habitat Work Schedule (Habitat Work Schedule) factors.

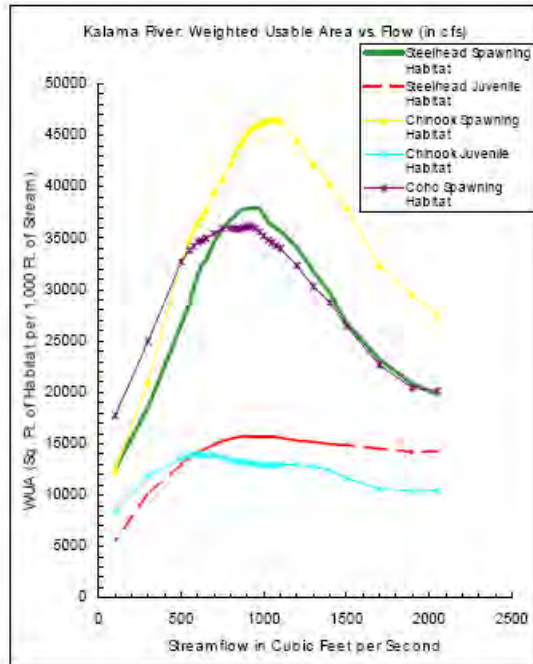
	HWS Factor	Mitigation Actions
1	Off channel and side channel habitat	Side Channel/ Off-Channel Habitat Restoration
2	Stream channel habitat structure and bank stability	In-channel Improvements
3	Watershed conditions and hillslope processes	Wetland Restoration
4	Floodplain function and channel migration processes	Floodplain Re-connection
5	Riparian conditions and functions	Riparian Preservation and Restoration

East Fork Lewis River Fish Habitat: Weighted Usable Area vs. Flow (in CFS)



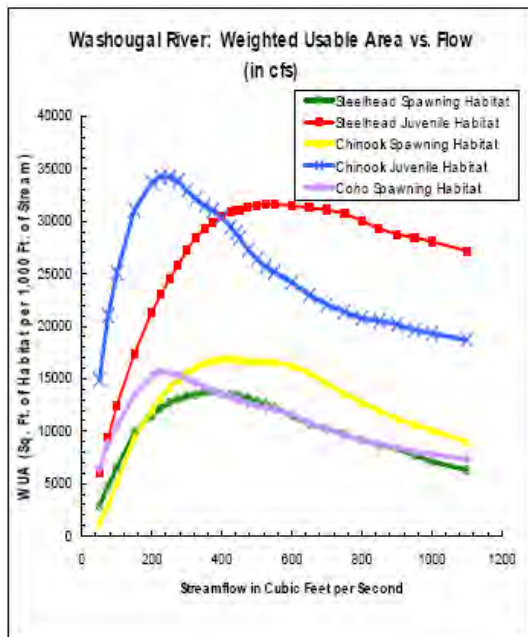
Flow in cfs	Steelhead Spawning Habitat	Steelhead Juvenile Habitat	Chinook Spawning Habitat	Chinook Juvenile Habitat	Coho Spawning Habitat
705	20516	17219	23548	11969	18418
650	21607	18102	25747	12687	19374
600	22565	18976	27412	13708	20607
580	22936	19346	28049	14352	21199
560	23111	19728	28529	15079	21865
540	23564	20075	28870	15783	22468
520	23896	20353	29089	16398	23098
500	24077	20590	29202	17186	23905
480	24196	20804	29178	18017	24816
460	24254	20979	29045	18754	25434
440	24112	21084	28879	19403	25893
420	23837	21153	28507	20108	26195
400	23559	21163	27846	20807	26499
380	23301	21067	27007	21421	26689
360	22767	20888	25962	22115	27167
340	22262	20554	24614	22754	27576
320	21649	20177	23051	23307	27652
300	20871	19677	21418	23815	27453
280	19986	19085	19893	24278	27149
260	18944	18346	18337	24646	26693
240	17913	17494	16998	24763	26204
220	16940	16540	15649	24708	25605
200	15956	15362	14439	24682	24908
175	14629	13757	12836	24286	23779
150	13169	12072	11162	23330	22460
125	11328	10511	9480	21182	20392
100	9625	8984	7663	17514	17482
70	7424	7091	5931	9089	12606
50	5576	5601	4244	6464	8680
14	1054	3192	283	2680	1770

Kalama River Fish Habitat: Weighted Usable Area vs. Flow (in cfs)



Flow in cfs	Steelhead Spawning Habitat	Steelhead Juvenile Habitat	Chinook Spawning Habitat	Chinook Juvenile Habitat	Coho Spawning Habitat
2050	19775	14274	27521	10475	20137
1900	20549	14199	29559	10433	20440
1700	23193	14512	32358	10616	22670
1500	26753	14862	37943	11634	26467
1400	29665	14961	40256	12470	28732
1300	31748	15197	42193	12765	30299
1200	34095	15269	44474	12963	32324
1100	35716	15588	46308	12972	34019
1075	35960	15643	46557	12928	34274
1050	36204	15670	46519	12899	34575
1025	36540	15669	46476	12903	34811
1000	37244	15663	46296	12911	35215
975	37866	15665	46136	12959	35621
950	37823	15708	45919	13045	35960
925	37886	15713	45651	13119	36130
900	37876	15736	45166	13173	36145
875	37823	15729	44610	13208	36004
850	37551	15669	44001	13242	35850
825	37114	15571	43252	13318	35803
800	36798	15466	42289	13437	35991
750	35926	15277	40753	13705	35929
700	34667	14896	39520	13858	35462
650	32856	14497	37888	13864	34992
625	32458	14319	37082	13916	34747
600	31367	14126	36466	13952	34619
575	30124	13899	35708	13973	34224
550	28596	13628	34759	13863	33821
500	26572	13064	32710	13550	32711
300	18565	10044	21030	11902	24969
100	12474	5671	12467	8339	17729

Washougal River Fish Habitat: Weighted Usable Area vs. Flow (in cfs)



Flow (in cfs)	Steelhead Spawning Habitat	Steelhead Juvenile Habitat	Chinook Spawning Habitat	Chinook Juvenile Habitat	Coho Spawning Habitat
1100	8300	27171	8982	18895	7326
1000	7122	28064	10134	19329	7794
950	7716	28432	10806	19637	8061
900	8320	28765	11192	20165	8415
850	8738	29272	11981	20512	8785
800	9132	30036	12746	20744	9143
750	9700	30721	13599	21376	9630
700	10220	31095	14565	22066	10239
650	10710	31271	15563	22965	10818
600	11449	31467	16250	24173	11832
550	12272	31631	16595	25170	12096
525	12669	31628	16686	25662	12233
500	12871	31510	16856	26393	12452
475	13157	31320	16708	27246	12653
450	13378	31063	16824	28420	12983
440	13395	30980	16883	28873	13101
425	13442	30864	16970	29478	13313
400	13632	30442	16901	30368	13566
375	13779	29803	16755	31018	13834
350	13732	29278	16512	31459	14225
325	13491	28413	16087	32131	14615
300	13363	27243	15570	32896	15002
275	13071	25866	14925	33945	15396
250	12765	24508	14125	34207	15509
225	12173	22995	13173	34022	15098
200	11473	21345	12024	33665	15328
150	9903	17428	9368	31067	13450
100	8675	12490	5112	25110	10491
75	4799	9371	3012	21068	8869
50	2873	6010	1275	14882	6445

Average Sq. ft. lost per 1000 ft of stream per 0.1 cfs incremental reduction in flow

Sub-Basin	Change in WUA
E.F. Lewis River	7
Kalama River	8
Washougal River	4

Attachment E

Example of Flow-Related Mitigation

Clark Public Utilities (CPU) Fargher Lake (Gilmour) Water Rights Case Study

Note: This case study description was authored by Clark Public Utilities. The WRIA 25-28 Mitigation Subcommittee responses to the questions raised are included below.

Case Study Description:

Clark Public Utilities needs additional water rights in the Pioneer, Meadow Glade, and Sara areas to augment supply in the north Clark County vicinity, including growth that is occurring in the Battle Ground and Ridgefield areas. Consistent with the WRIA 27/28 Planning Unit recommendations; CPU is targeting the deep Sand and Gravel Aquifer (SGA) as a source of supply while remedial solutions are implemented to clean up contamination that has affected the shallow Pleistocene Alluvial Aquifer (PAA) in the Vancouver Lake lowland. Operation of new supply sources would ultimately affect discharge of groundwater to nearby surface water bodies such as the East Fork Lewis River, Lake River, and the Columbia River. The East Fork would be considered a closed water body under the new watershed planning rules whereas Lake River and the Columbia River would be open to further appropriations.

PGG developed a preliminary groundwater flow model to evaluate how SGA development might influence stream flow in the lower portions of the East Fork Lewis River. **Figure 1** shows the locations of potential future supply wells in the model area. Under peak supply development Wells 32 and 33 would be operated at about 1,400 gpm and the Sara well would be operated at about 1,500 gpm (total pumping rate of 4,300 gpm or 9.6 cfs). Average rates of withdrawal would be about one-half the peak rates or a total of about 2,150 gpm (4.8 cfs).

PGG used the preliminary groundwater flow model to assess rates of streamflow capture based on the average rate of groundwater withdrawal from the proposed supply areas. **Figure 2** presents the estimated baseflow depletion along the East Fork of the Lewis River under these average withdrawal conditions. Baseflow depletion accumulates from upstream to downstream. Predicted rates of depletion are relatively small upstream of RM 9.4 due to isolation of the East Fork from the production aquifer (SGA). The model predicts that only 0.04 cfs of stream flow depletion would occur upstream of RM 9.4. Downstream of RM 9.4, where the pumped aquifer is in greater hydraulic connection to the East Fork, the model predicts a higher rate of stream flow depletion. Just above the confluence between the East Fork and the North Fork, the model predicts a net stream flow depletion of about 2.0 cfs (46% of pumping).

The model assumes that the wells would be operated at a continuous average rate. However actual production would be linked to seasonal demand with pumping rates varying by a factor of about two. The exact timing of seasonal capture would be dependent on the distance of the pumping well from the river and the storage properties of the aquifer. Given the distance of the proposed pumping centers from the river and the fact that the aquifer in the Pioneer area is

unconfined, significant lag times might be expected. Most of the capture would be focused on the mainstem, although the lower portion of small tributaries such as McCormick Creek might be affected to some extent. Very limit capture would occur below RM 2.5 as the East Fork enters the bedrock canyon downstream of LaCenter.

To mitigate for the potential impacts to the East Fork system CPU purchased a surface-water right for irrigation from the Gilmour farm near Fargher Lake Village, in the East Fork Lewis River watershed. The Gilmour water right has been evaluated and determined to represent an active water use from a small creek (Swale Creek tributary to Rock Creek), for a substantial amount of water, in a surface water basin with limited flows.

The water right was issued for 0.92 cfs and irrigation of 92 acres. In recent years, Gilmour's irrigated acreage expanded to about 150 acres. Water was used to grow mint and seed grass and for processing of the mint during the harvest season. Total consumptive use during the irrigation season for the Gilmour agricultural operation varied between 0.07 cfs in April to as high as 1.3 cfs during July and then to as low as 0.65 cfs in September. The Gilmour Farm did not use water during the non-irrigation season that extends between October and March.

The retirement of the Gilmour right will have significant instream flow benefits for the entire length of Rock Creek downstream from Fargher Lake, as well as for the East Fork Lewis River from the mouth of Rock Creek to La Center, where the river becomes tidally influenced via the Columbia River. **Figure 2** illustrates how the retirement of the Gilmour right will enhance flows in Rock Creek and portions of the East Fork Lewis River above RM 9.4 and mitigate stream flow capture impacts due to groundwater pumping below RM 9.4.

The diversion lies near the headwaters of Rock Creek or approximately 6 river miles north of the East Fork Lewis River. Rock Creek enters the East Fork at RM 16 or approximately 7 miles upstream of where future withdrawals by CPU will induce capture from the stream. Increased flow would be realized through a reach of about 13 miles that extends from Gilmour diversion on Rock Creek down to Daybreak Park (**Figure 1**).

Stream flow surveys by PGG and Clark County personnel indicate that flow ceases in the upper reaches of Rock Creek during the late summer and early fall. The stream was observed to be dry at the SR-503 crossing in early July, 2003 and county personnel have observed dry streambed conditions at Gabriel Road in early fall. Therefore, additional water introduced near the headwaters of the stream should provide substantial habitat benefits to the entire Rock Creek drainage.

Questions presented to the WRIA 25-28 Mitigation Subcommittee, and Proposed Responses:

1. Most debits from Reserve Block are going to be year-round uses, while most of water rights available for mitigation are going to be seasonal in nature with a different use profile – how do we reconcile that difference?

Mitigation Subcommittee Response: Management of both high and low flows is addressed in the Plan (Section 4.1, Appendices H and F). However, the plan emphasizes

the importance of managing flows during the dry periods of the year to provide for protection of fish, other aquatic life, recreation, and watershed health (Pg 4-1, Pg H-5, etc). The Plan makes numerous references to maintenance of baseflows as a high priority (Pg H-5). In light of this, for each application Ecology and WDFW would need to define the critical baseflow period, based on the fish populations and life histories present in relation to the hydrograph. Ecology would also make the determination on how much of an existing water right proposed for retirement would be recognized for use in mitigation, as well as the timing, using existing procedures. Ecology would then assess the volume and timing of mitigation flows in relation to the critical baseflow period, using the WRIA 25-28 mitigation guidelines.

(Note: Please refer to the attached “CPU Fargher Lake (Gilmour) Mitigation Example Weighting of Flow-Related Mitigation” document for an example of how to evaluate seasonality.)

2. With a larger summer irrigation season hit and minimal use the rest of the year, how do we assess “value” of an irrigation right for mitigation and how do we factor in the timing of capture vs. the timing of consumptive irrigation use vs. the timing of low flow season which may extend into late September or early October?

Mitigation Subcommittee Response: As noted above, the critical flow period would have to be defined based on the hydrograph, fish considerations, and the other beneficial uses involved. Pg H-7 states that “*responsibility for analysis of available water sources lies with the water rights applicant*”, and that the “*application for the reservation will be reviewed, analyzed, and processed by Ecology in consultation with Fish and Wildlife*”. Based on this, if information on the relationship between capture, consumption and critical flow periods is lacking, Ecology could require it as part of the submittal. If it is not available, assumptions would have to be made and documented for use in the evaluation process.

3. Historical water use by Gilmour has varied seasonally due to his historical agricultural practices. Theoretically, Mr. Gilmour would be able to place the full 0.92 cfs into use between May 1 and October 1 of every year. Therefore, shouldn’t the full water right quantity be recognized for mitigation regardless of what recent patterns were established for consumptive use?

Mitigation Subcommittee Response: The authority for determining how much of a water right will be recognized as valid for mitigation purposes lies with the Department of Ecology. The WRIA 25-28 Mitigation Subcommittee has not developed specific guidelines or recommendations for determining how much of an existing water right would be recognized based on use patterns.

4. How do we define the stream flow capture reach? As noted above, capture would accrue incrementally from near zero at Daybreak Park (RM 9.4) to about 2.0 cfs near the bedrock notch just downstream of LaCenter (RM 2.5). If we define depletion in terms of both capture and distance along the stream, then what values do we assign to each?

Mitigation Subcommittee Response: In cases where capture varies across stream reaches, it could be proportioned along the stream gradient (see attached worksheet). If modeling is available, it should be used as the basis for proportioning. Two options for determining a “point of withdrawal” for assessing whether the 50% requirement is met could include using the midpoint of each proportioned reach and making individual depletion determinations, or establishing a single midpoint and averaging depletion for the combined reaches.

5. How much credit should CPU receive for the flow mitigation? Mitigation will be introduced almost 13 miles upstream of the area of capture. How do you assess “value” of providing mitigation water this far upstream from the area of capture? If no additional surface water rights become available for purchase, will CPU’s total capture within the lower East Fork be limited to 1.84 cfs with half this amount mitigated by the Gilmour right?

Mitigation Subcommittee Response: Credit will be determined using the draft flow-related mitigation guidelines the Planning Unit has been developing. Credits and debits will address factors such as length of stream affected, the reach tiering, and the flow impacts/benefits in each reach. Other weighting factors include water quality, timing, and the mainstem/tributary relationship. The attached draft spreadsheet presents one example of how the various factors could be documented to assist with credit determinations (see attached).

6. CPU is also investigating development of water supply from the Lewis River and Vancouver Lake lowland areas. The Lewis River supply would come from the shallow Pleistocene Alluvial Aquifer (PAA) that is hydraulically connected to the tidal reaches of both the East Fork and North Fork of the Lewis River. The Vancouver Lake lowland supply would initially come from the deep SGA aquifer and eventually the PAA aquifer after a remedial solution has been developed for the environmental sites that occur in the area. The costs associated with development of both of these supply areas would be far greater than development of new supplies in the Pioneer, Meadow Glade, and Sara area and it may take considerably longer to develop these supplies given the need to secure water rights and build infrastructure. CPU currently uses most all of their primary annual (Qa) water rights and new water rights are needed immediately to meet projected growth.

According to Section 3.3.3 of the WRIA 27/28 Watershed Plan:

Communities requesting additional ground water rights to serve growth must evaluate the relationship of their proposed water supply projects to stream flows.

Where this evaluation indicates that development of the source of supply will impact the flow regime, the Planning Unit recommends that the municipal water supplier analyze alternative options for water supplies. In such cases, supply alternatives include use of a different (most likely a deeper) aquifer, purchase of water from a neighboring community, development of a tidally-influenced source, or purchase of water from a regional water system.

If the supply alternatives analysis indicates that no practicable alternative is available, the water right applicant may petition Ecology to utilize a ‘reservation of water defined within state rule (see Section 4.4.1).

A critical question for the Planning Unit is whether CPU is eligible to access their Reserve Block in the East Fork Lewis River if they have alternate supplies available in areas with out stream closures even though it may be far more expensive and time consuming to use these alternative supplies?

Mitigation Subcommittee Response: Development of regional water sources is described as a “critical” Planning Unit recommendation (Pg H-5 and H-6), and based on the above we understand that CPU is investigating two potential sources identified in the Plan. If alternative supplies with fewer impacts are available, then per Section 3.3.1 the Planning Unit recommends they be used. However, the Plan also recognizes temporal constraints. Pg H-5 states that

“Municipalities striving to meet demand in the interim period prior to development of a regional source, or in cases where regional sources are not feasible, should develop deep groundwater sources that are not in connectivity with surface waters. In cases where it is not feasible to avoid the use of groundwater in connectivity with surface water, a reservation of water will be reserved in rule to meet demand. The water rights applicant must evaluate all potential sources and demonstrate why use of the reservation is required”

Pg H-7 goes on further to state the following

“The Planning Unit recommends that Ecology consider the applicant’s request to access the reservation of water relative to its intended use and timeframe. Several public purveyors have interim needs while a regional water source is developed. The Planning Unit supports an interim use of the reservation, especially as the certainty of a regional source increases and the reservation is retired after this interim use, or its use is diminished to fill a water system redundancy (backup) need. Ecology should consider a diminished use in terms of its predicted frequency of use and impact on fish habitat”.

These Plan provisions suggest that while CPU continues to investigate and pursue development of regional water sources, use of the reservation would be appropriate.

CPU Fargher Lake (Gilmour) Mitigation Example Weighting of Flow-Related Mitigation

As an illustration of the weighting procedure for flow-related mitigation, the CPU Fargher Lake (Gilmour) mitigation project is scored below. The scoring is illustrative only, for purposes of discussing the weighting methodology. This weighting example is not intended to be used for actual processing of CPU's associated water rights application. This information is not a complete representation of the flow-related mitigation evaluation procedure. This information should be used in conjunction with other data developed for this example.

The example addresses only the East Fork Lewis River mainstem and Rock Creek. At this time, consideration is not given to other tributaries that could be affected by the proposed well withdrawals, as they have not been modeled. The scoring process for this case study is described below, and is summarized in Table 1.

Table 1. Summary Scoring Table

Weighting Factor	Depletion Weight (normalized to 100 total)	Mitigation Weight (assessed relative to Depletion Weight)
Mainstem/trib relationship	n/a	n/a
Length of stream affected	34	49
LCFRB Tiers	33	57
Seasonality	33	28
Water Quality	n/a	n/a
Total Weight	100	134
Relative Value of Mitigation:	134/100 = 1.34	

Step 1: Select Weighting Factors

Three weighting factors are selected from the menu of five possible factors.

- The mainstem/tributary relationship is excluded because mitigation affects all the depleted reaches on the mainstem. Additional contribution for Rock Creek is covered under “length” and “tiers” so it was not being counted again here.
- Water quality is excluded because mitigation water and depleted water are both “high quality”.

Step 2: Determine Depletion Weights

The three remaining weighting factors are assigned depletion weights, summing to 100. In the absence of better information, for this example it is assumed they should be equally weighted.

Step 3: Determine Mitigation Weights

Each individual factor is assessed. The Mitigation weight is scored either higher or lower than depletion weight, based on the analysis provided in the attached spreadsheet and application of professional judgment. In determining weighting factors related to length of stream and LCFRB reach tiers, flow is factored into each calculation. To accurately reflect habitat quantity, distance is also factored into tier weighting (see attached Excel spreadsheet).

- **Length.** Flow benefits and impacts vary along stream distance. To accurately assess the relative value of length, it must be considered in relation to flow quantity. For weighting purposes, length is therefore expressed in terms of “cfs-miles”. As presented in the attached spreadsheet, this is calculated by multiplying flow (cfs) by the stream reach length (miles).

The mitigation covers approximately 20 cfs-miles, while the depletion affects approximately 14 cfs-miles. Dividing 20 by 14 yields a factor of 1.4. This indicates the mitigation is 1.4 times “longer” than the depletion, taking into account flow. The mitigation score is thus 1.4 times higher than the depletion score.

- **Tiers.** Tier designations reflect the relative importance of a particular stream reach to fish from a population recovery perspective. To accurately weigh the value of tier designations in relation to overall flow benefits and impacts, the reach length and flow contribution must also be considered. For weighting purposes, stream tiering is therefore expressed in terms of “cfs-tier-miles”. As presented in the attached spreadsheet, this is calculated by multiplying “cfs-miles” by the assigned tier score.

The mitigation covers the same reaches as the depletion, as well as additional reaches. This gains some extra credit for the mitigation score. Rock Creek is a Tier 4 reach and thus doesn’t add much in terms of tiering score (note that the extra length for Rock Creek was credited separately). However, East Fork Reach 8b is Tier 1 and over 5 miles long, and therefore adds substantial habitat value. The mitigation provides approximately 52 cfs-tier-miles, while the depletion score addresses approximately 30 cfs-tier-miles. The mitigation score is thus 1.7 times higher than the depletion score.

- **Seasonality.** In evaluating seasonality, consideration must be given to flow benefits and depletion in relation to the hydrograph, as well as flow-habitat relationships for the species of interest. IFIM results demonstrate that for the species of interest, habitat availability is sensitive to flow changes from the lowest flows of record to approximately 500 cfs, at which point weighted usable area (WUA) begins to decline with increased flow. Average monthly statistics indicate that for the 50% exceedance flow, a discharge of 500 cfs or lower usually occurs between mid-May to mid-October, thus defining the critical flow period. As described in this case study, irrigation typically occurred between April and September, which addresses approximately 5 of the 6 critical months. The seasonality weighting is therefore given a rating of 27 (5 divided by 6, multiplied by 33). (Note: if the full water right quantity were recognized throughout the critical flow period, down-weighting would not result).

Step 4: Determine Mitigation Credit

The weighted mitigation scores are summed up, and the sum (134) is then compared with the standard 100 score on the depletion side. In this case, the mitigation scores higher, by a factor of 1.34. The overall result of 1.34 can be used to determine how much “credit” will be awarded for the mitigation action. Assuming a value of 0.92 cfs is used as the base quantity of mitigation, this could be up-weighted as follows:

$$1.34 \times 0.92 \text{ cfs} = 1.23 \text{ cfs}$$

While this quantity cannot be used to satisfy the 50% requirement, it can be used to calculate the remaining, unmitigated stream depletion. Assuming a maximum depletion quantity of 2.0 cfs, this is:

$$2.0 \text{ cfs} - 1.23 \text{ cfs} = 0.77 \text{ cfs}$$

(Note: The variable depletion presented in the case study may warrant a more complex calculation)

Use of Results (after weighting procedure). For purposes of determining whether the 50% flow-related mitigation threshold is met, the mitigation guidelines (Appendix C) call for establishment of a discrete “point of impact” on the affected water body for ground water applications. In this case study, streamflow depletion varies across stream reaches, increasing from RM 9.4 (Daybreak Park) to the mouth. Streamflow depletion was therefore partitioned into distinct segments (see attached spreadsheet).

The attached analysis demonstrates that if the acquired water right is valued at 0.92 cfs, mitigation flows would exceed 50% of the modeled depletion levels at the mid-point of all but the lower-most 5 affected stream reaches. In the lower-most 5 reaches, where flow would be depleted by 2 cfs, mitigation flows would only comprise 46% of the net stream flow depletion. This is below the required 50% threshold. When distance, tiering and flow are factored together, a net positive gain of 22 cfs-tier-miles would result from the proposed mitigation.

For illustrative purposes, if flow-related mitigation requirements were deemed satisfied, the applicant would be required to mitigate the remaining 0.77 cfs of stream flow depletion using habitat/watershed mitigation actions; as long as it is “practicable” (including cost considerations).

It should be noted that this example is presented to demonstrate how the flow-related and habitat scoring procedures could be applied, and how a spreadsheet analysis could be used to facilitate calculations. Factors such as tributary impacts, modeling assumptions, “point of impact” establishment, and the variable pumping and streamflow depletion described in this case study may necessitate more complex calculations and evaluation.

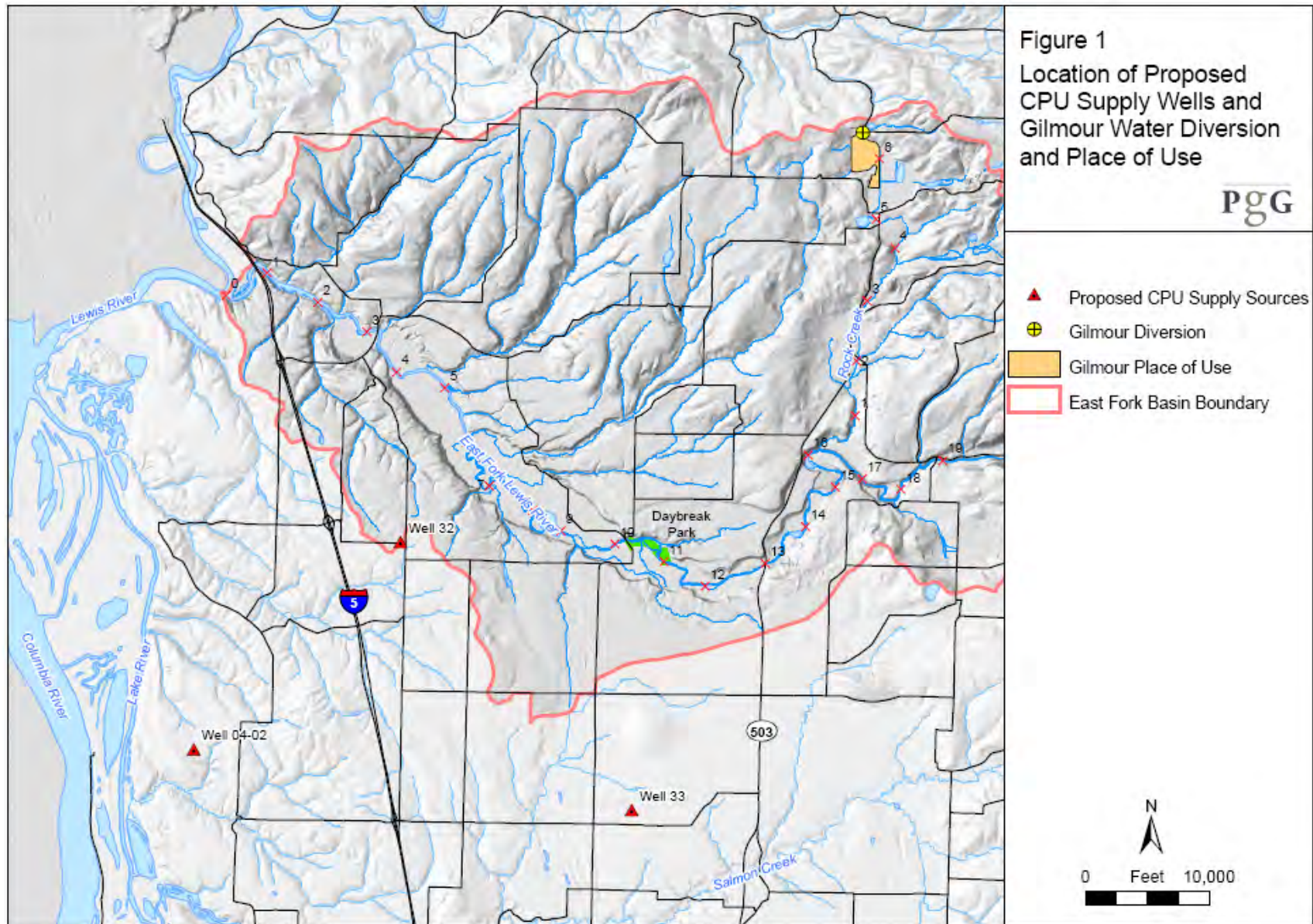
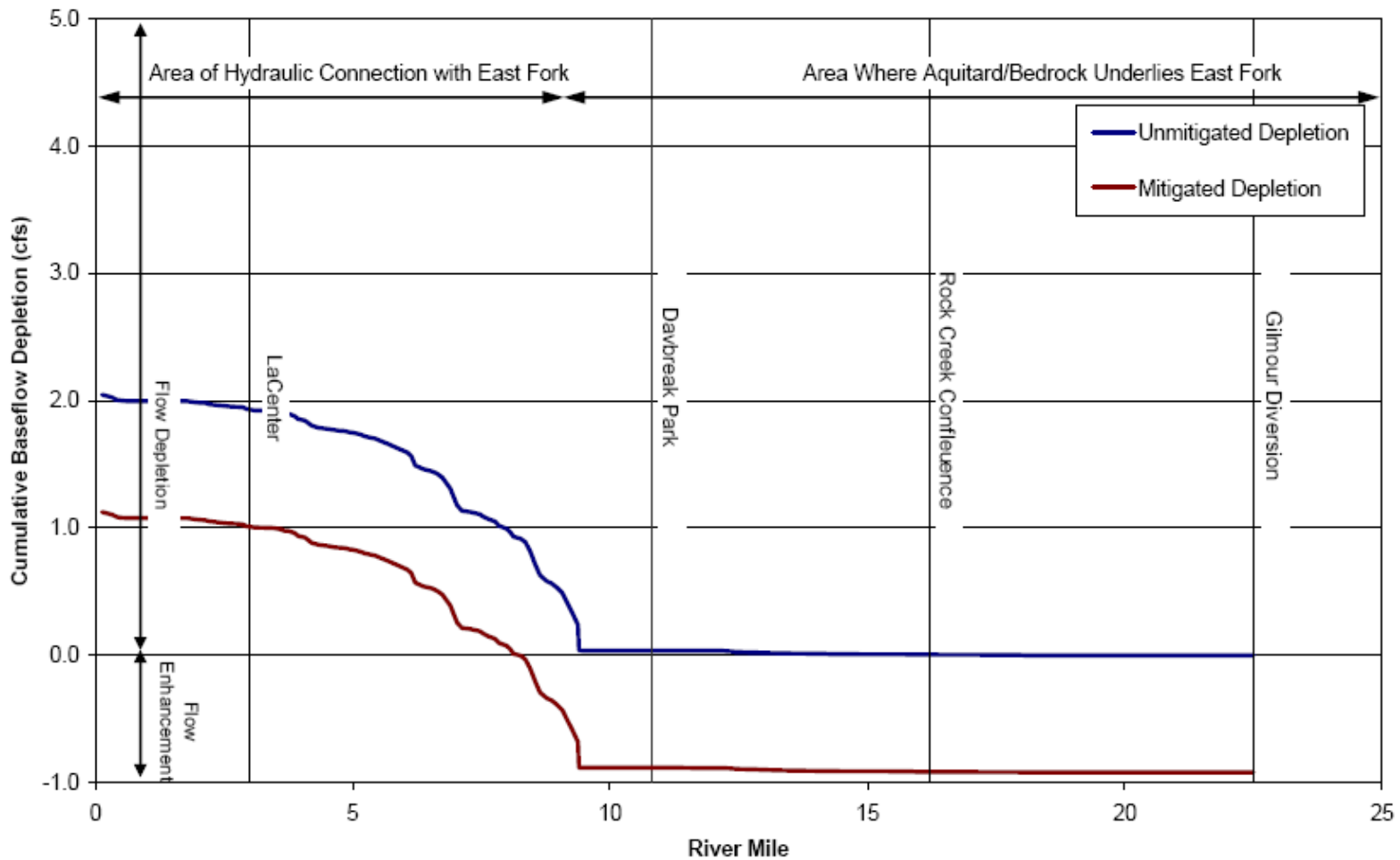
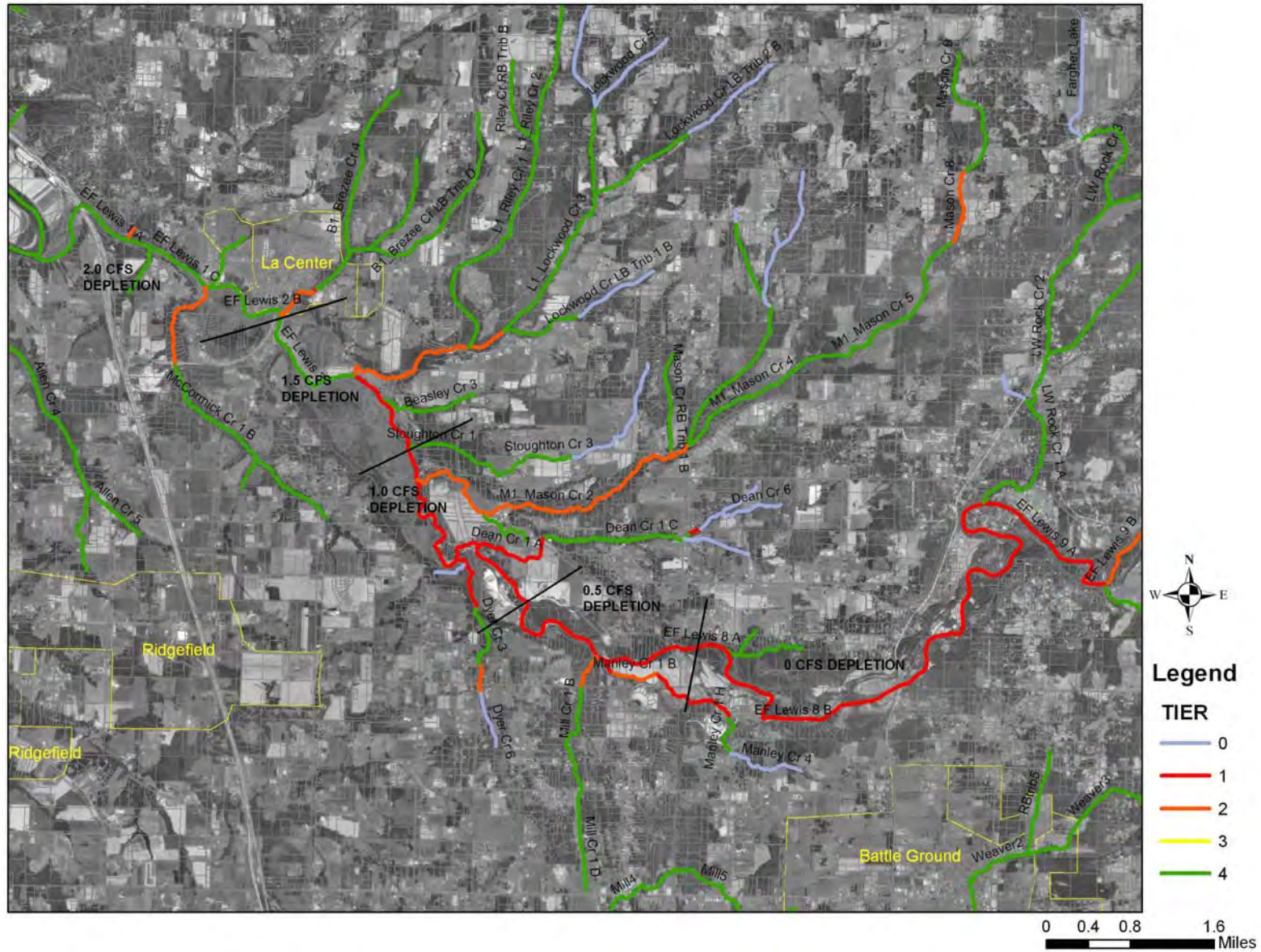


Figure 2
Estimated Baseflow Depletion in East Fork Lewis River





CPU Fargher Lake (Gilmour) Water Rights Mitigation Example															
				CREDIT				DEBIT				NET			
EDT_REACH	DESCRIPTION	TIER	TIER SCORE	LENGTH MILES	CFS X MI			CFS X MI	CFS X MI			CFS X MI	CFS	CFS X MI	CFS X MI
					CFS	MAINSTEM	TRIB	X TIER	CFS	MAINSTEM	TRIB	X TIER	CFS	CFS X MI	X TIER
EF Lewis 1 A	Mouth to Jenny Cr	4	1	1.42	0.92	1.3064	0	1.3064	2	2.84	0	2.84	-1.08	-1.5336	-1.5336
EF Lewis 1 B	Jenny Cr to EF Lewis LB Trib 1	4	1	0.24	0.92	0.2208	0	0.2208	2	0.48	0	0.48	-1.08	-0.2592	-0.2592
EF Lewis 1 C	EF Lewis LB Trib 1 to McCormick Cr 1	4	1	0.65	0.92	0.598	0	0.598	2	1.3	0	1.3	-1.08	-0.702	-0.702
EF Lewis 2 A	McCormick Cr 1 to EF Lewis RB Trib 1	4	1	0.05	0.92	0.046	0	0.046	2	0.1	0	0.1	-1.08	-0.054	-0.054
EF Lewis 2 B	EF Lewis RB Trib 1 to Brezee Cr 1	4	1	0.89	0.92	0.8188	0	0.8188	2	1.78	0	1.78	-1.08	-0.9612	-0.9612
EF Lewis 3	Brezee Cr to Lockwood Cr	4	1	1.24	0.92	1.1408	0	1.1408	1.5	1.86	0	1.86	-0.58	-0.7192	-0.7192
EF Lewis 4 A	Lockwood Cr to Beasley Cr	1	4	0.37	0.92	0.3404	0	1.3616	1.5	0.555	0	2.22	-0.58	-0.2146	-0.8584
EF Lewis 4 B	Beasley Cr to Stoughton Cr	1	4	0.53	0.92	0.4876	0	1.9504	1.5	0.795	0	3.18	-0.58	-0.3074	-1.2296
EF Lewis 4 C	Stoughton Cr to Mason Cr	1	4	0.35	0.92	0.322	0	1.288	1	0.35	0	1.4	-0.08	-0.028	-0.112
EF Lewis 5 A	Mason Cr 1 to Dyer Cr	1	4	1.29	0.92	1.1868	0	4.7472	1	1.29	0	5.16	-0.08	-0.1032	-0.4128
EF Lewis 5 B	Dyer Cr to Dean Cr	1	4	0.36	0.92	0.3312	0	1.3248	1	0.36	0	1.44	-0.08	-0.0288	-0.1152
EF Lewis 6 A	Dean Cr 1 to Storedahl Pools	1	4	0.27	0.92	0.2484	0	0.9936	1	0.27	0	1.08	-0.08	-0.0216	-0.0864
EF Lewis 6 B	Storedahl Pools	1	4	0.51	0.92	0.4692	0	1.8768	1	0.51	0	2.04	-0.08	-0.0408	-0.1632
EF Lewis 6 C	Storedahl pools to Mill Cr 1	1	4	1.19	0.92	1.0948	0	4.3792	0.5	0.595	0	2.38	0.42	0.4998	1.9992
EF Lewis 7	Mill Cr 1 to Manley Cr 1	1	4	0.09	0.92	0.0828	0	0.3312	0.5	0.045	0	0.18	0.42	0.0378	0.1512
EF Lewis 8 A	Manley Cr 1 to EF Lewis RB Trib 2	1	4	1.25	0.92	1.15	0	4.6	0.5	0.625	0	2.5	0.42	0.525	2.1
EF Lewis 8 B	EF Lewis RB Trib 2 to Rock Cr 1	1	4	5.47	0.92	5.0324	0	20.1296	0	0	0	0	0.92	5.0324	20.1296
LW Rock Cr 1 A	Mouth to Lw Rock Cr RB Trib	4	1	1.50	0.92	0	1.38	1.38	0	0	0	0	0.92	1.38	1.38
LW Rock Cr 1 B	Lw Rock Cr RB Trib to Lw Rock Cr LB Trib 1	4	1	0.58	0.92	0	0.5336	0.5336	0	0	0	0	0.92	0.5336	0.5336
LW Rock Cr 2	Lw Rock Cr LB Trib 1 to Lw Rock Cr LB Trib 2	4	1	1.68	0.92	0	1.5456	1.5456	0	0	0	0	0.92	1.5456	1.5456
LW Rock Cr 3	Lw Rock Cr LB Trib 2 to Lw Rock Cr Culv 1	4	1	0.64	0.92	0	0.5888	0.5888	0	0	0	0	0.92	0.5888	0.5888
LW Rock Cr 4	Lw Rock Cr Culv 1 to Lw Rock Cr Culv 2	4	1	0.55	0.92	0	0.506	0.506	0	0	0	0	0.92	0.506	0.506
LW Rock Cr 5	Lw Rock Cr Culv 2 to Fargher Lake mint/blueberry farms	4	1	0.47	0.92	0	0.4324	0.4324	0	0	0	0	0.92	0.4324	0.4324
LW Rock Cr LB Trib 1 A	Mouth to Lw Rock Cr LB Trib Dam 1	4	1	2.16	0	0	0	0	0	0	0	0	0	0	0
LW Rock Cr LB Trib 1 B	Lw Rock Cr LB Trib Dam 1 to Lw Rock Cr LB Trib Dam 2	0	0	0.17	0	0	0	0	0	0	0	0	0	0	0
LW Rock Cr LB Trib 1 C	Lw Rock Cr LB Trib Dam 2 to end of presumed coho/std	0	0	0.18	0	0	0	0	0	0	0	0	0	0	0
LW Rock Cr LB Trib 2	Mouth to end of presumed Coho	4	1	1.60	0	0	0	0	0	0	0	0	0	0	0
LW Rock Cr RB Trib A	Mouth to Lw Rock Cr RB Trib Culv	4	1	0.07	0	0	0	0	0	0	0	0	0	0	0
LW Rock Cr RB Trib B	Lw Rock Cr RB Trib Culv to end of potential Coho, creek bypasses the ponds	0	0	0.35	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 A	Mouth to Manley Cr Culv 1	1	4	0.15	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 B	Manley Cr Culv 1 to Manley Cr Culv 2	2	3	0.44	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 C	Manley Cr Culv 2 to Manley Cr Culv 3	1	4	0.42	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 D	Manley Cr Culv 3 to Manley Cr Culv 4	1	4	0.13	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 E	Manley Cr Culv 4 to Manley Cr Culv 5	1	4	0.24	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 F	Manley Cr Culv 5 to Manley Cr Culv 6	1	4	0.11	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 G	Manley Cr Culv 6 to Manley Cr Culv 7	1	4	0.03	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 1 H	Manley Cr Culv 7 to Manley Cr Culv 8	4	1	0.34	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 2	Manley Cr Culv 8 to Manley Cr Culv 9	4	1	0.11	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 3	Manley Cr Culv 9 to Manley Cr Culv 10	0	0	0.07	0	0	0	0	0	0	0	0	0	0	0
Manley Cr 4	Manley Cr Culv 10 to end of potential coho/std	0	0	0.71	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 A	Mouth to McCormick Cr Culv 1	2	3	0.95	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 B	McCormick Cr Culv 1 to McCormick Cr Culv 2	4	1	0.87	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 C	McCormick Cr Culv 2 to McCormick Cr LB Trib	4	1	0.43	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 D	McCormick Cr LB Trib to McCormick Cr Culv 2	4	1	0.03	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 E (pond)	Pond associated with McCormick Cr Culv 2	4	1	0.13	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 F	Top of McCormick Cr 5 (pond) to McCormick Cr Culv 4	4	1	0.41	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 G (pond)	Pond associated with McCormick Cr Culv 4	4	1	0.11	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 H (pond)	Pond associated with McCormick Cr Culv 5	4	1	0.10	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr 1 I	Top of McCormick Cr 8 (pond) to end of potential coho/std	4	1	0.13	0	0	0	0	0	0	0	0	0	0	0
McCormick Cr LB Trib	Mouth to end of pre std	4	1	0.29	0	0	0	0	0	0	0	0	0	0	0
Mill Cr 1 A	Mouth to Mill Cr Fishway	2	3	0.34	0	0	0	0	0	0	0	0	0	0	0
Mill Cr 1 B	Mill Cr Fishway to Mill Cr Culv 1	4	1	0.72	0	0	0	0	0	0	0	0	0	0	0
Mill Cr 1 C	Mill Cr Culv 1 to Mill Cr Culv 2	4	1	0.28	0	0	0	0	0	0	0	0	0	0	0
Mill Cr 1 D	Mill Cr Culv 2 to end of coho/std, joins with Salmon Cr Trib Mill Cr	4	1	1.15	0	0	0	0	0	0	0	0	0	0	0
				34.81		14.8764	4.9864	52.0996		13.755	0	29.94		6.1078	22.1596
						Total M+T	19.8628	52.0996		Total M+T	13.755	29.94			
Impact Partitioning Assumptions															
Partitioning of Impacts:															
North Fork Lewis to LaCenter = 2.0 cfs impact															
LaCenter to Stoughton Creek = 1.5 cfs impact															
Stoughton Creek to Stordahl Ponds = 1.0 cfs impact															
Stordahl Ponds to Daybreak = 0.5 cfs impact															
Partitioning is for illustrative purposes and can be refined based on modeling results															
Other Assumptions															
Impacts to McCormick, Dyer, Mill and Manley Creeks are likely, but not quantified or modeled. Consideration of tributary impacts is needed.															
No debit assumed upstream of Daybreak															
No benefit assumed in tribs to Rock Creek or East Fork															
Assumes 0.92 CFS water right value - actual to be determined by Ecology															

Attachment F

Cost Considerations Background and Options Considered

I. Background: References to Cost Considerations from Watershed Management Plans

“If the supply alternatives analysis indicates that no **practicable** alternative is available, the water right applicant may petition Ecology to utilize a ‘reservation’ of water defined within the State Rule.” (see further text below regarding definition of “practicable.”)

“The Planning Unit recommends that where an applicant applies for a water right under a reservation, they be required to mitigate the predicted stream flow depletion to the maximum extent practicable through flow-related actions. **Practicable** is meant to include both **economic and logistical considerations.**”

“The Planning Unit recommends that Ecology (and Fish & Wildlife) consider **cost** to the applicant in terms of other supply alternatives, water supply total project cost, and the cost of the off-setting and mitigating actions. **These costs should be evaluated** within the context of other fish recovery actions that may be needed to compensate for impairment to stream flow.”

“No less than half of the predicted stream flow depletion must be offset through the acquisition of active upstream water rights or other flow augmenting actions in the same subbasin upstream of the new proposed water right. The Planning Unit recognizes there may be occasional exceptions where offsetting one half of the predicted stream flow depletion fully or in part may be **infeasible or cost-prohibitive...**”

[emphasis added]

II. Approaches Considered for Cost Considerations

Several methods were considered for defining a cost threshold for the reservation program. These include:

- Percentage of total cost for a water development project;
- Market value of water rights (selected as recommended approach);
- Economic value of water for in-stream purposes;
- Representative costs of similar mitigation actions.

These are discussed below, with pros and cons of each alternative. ***(Note: the alternatives presented here focus on cost considerations for evaluating mitigation actions. They do not necessarily apply to evaluating water supply alternatives.)***

1. Percentage of total cost for a water development project

Whether a cost is reasonable or not would be considered in the context of the applicant's overall cost for a new water source linked to the water right. The new supply project will typically be a new well or group of wells. Some percentage of total cost of the supply project could be defined as "reasonable" for mitigation. It may be useful to express this as a range, both to allow flexibility in application and to avoid distorting the external market for mitigation opportunities such as water rights available for sale in a given area.

Example:

- if mitigation cost is less than or equal to x % of total project cost, the cost of mitigation is automatically deemed reasonable (Note: the percentage levels would need to be defined in the Mitigation Strategy. Options could range from some fraction of total project cost to a value that potentially exceeds project cost [i.e. greater than 100%]);
- if mitigation cost is from x % to y % of total project cost (same x as above; and y > x), the amount of mitigation may be negotiable;
- In no case will mitigation be required at levels greater than y % of total project cost (same y as above). An applicant may voluntarily exceed this cap, but will not be required to do so in order to tap reserved water.

Pros:

- This option would be relatively easy to administer. The primary complication will be how to define "total project cost" for more complex water supply projects.

Cons:

- There is no direct relationship between project cost and the economic value of the water resource. Two projects using exactly the same resource and having similar impacts could have very different project costs and therefore yield different cost thresholds in the evaluation process. This could lead to inconsistent program outcomes from one user to another.

- Selection of the specific percentages to be used may be somewhat subjective.

2. Market value of water rights

Water rights are routinely bought and sold, or leased, in the State of Washington, other areas of the Pacific Northwest, and throughout the western states. Considerable data has been accumulated on the range of prices paid by municipal water suppliers for water rights. These prices are independent of project infrastructure needs for water projects, and reflect a cost solely to obtain access to a water resource.

Conceptually, use of comparable costs for water rights appears to provide an appropriate basis for comparison with mitigation costs, because mitigation costs also represent a cost to obtain access to the reserved water resource.

Under this approach, it is proposed that a standard unit cost be defined for water through comparison with actual water rights transactions. The cost would need to be adjusted periodically, reflecting changes in market conditions and willingness-to-pay. If mitigation costs per unit do not exceed this value, then the cost of mitigation would be considered “reasonable.”

Pros:

- As long as “comparable” transactions are used as the basis, prices paid for water rights represent the “willingness-to-pay” of municipal water systems, and thus yield a threshold that is not excessively burdensome.
- If a “standard” cost is defined, this approach can be relatively simple to apply to individual applications, and would also yield consistent results from user to user. The primary challenge is defining the standard cost and the means of adjusting it periodically.
- Most water users should find this approach easy to understand.
- The price of water rights reflects both immediate conditions and long-term expectations about the value of water.

Cons:

- This approach does not directly account for the resource value of water in the stream.
- Prices for water rights vary considerably from place to place based on local market conditions; and depending on the specific characteristics of each water right. This approach will require developing a standard cost, and some parties may not agree on the cost level that is selected for the program.

3. Economic value of water for in-stream purposes

Water has an intrinsic value for instream purposes. Society places a value on instream flows, as demonstrated by regulatory programs that limit withdrawal of water affecting stream flow.

This approach would involve estimating the value of instream flows in monetary terms, using methods that have been developed in the field of natural resource economics. The value

established would be used as a ceiling for expenditures on mitigation. The premise is that a municipal water supplier should not be required to pay more than the water is worth to support instream flows.

This approach could be applied case-by-case, with valuation applied to particular streams and reaches; or it could be applied on a standardized basis, with a single value being established across the region.

Pros:

- Among the options considered, this one would most closely reflect natural resource values. The mitigation program is intended to protect aquatic resources (in balance with serving water user needs), so it may be attractive to develop an approach based on intrinsic value of the affected resource.

Cons:

- This alternative would not represent “willingness to pay” by municipal water suppliers, because the basis is the intrinsic value of the resource rather than the value of water to the user.
- Estimating the value of instream resources in monetary terms is not an exact science, and typically results in a range of estimates. These ranges may be subject to considerable debate. Since instream values are not reflected in actual market data, indirect techniques for economic valuation are required. To develop a standardized value in the local context would require substantial economic analysis. The resulting cost is likely to be subject to controversy, and may need to incorporate a fairly wide range. To some, the methods used may appear to be a “black box.” If values are pulled from studies in other localities, the results are likely to be subject to even more debate.
- Estimating values on a case-by-case basis is likely to be prohibitively expensive. Because of the widely varying attributes of streams and reaches across the region, this would require considerable analysis by professional economists for each water right application.

4. Representative costs of similar mitigation actions (or water supply projects)

(Note: in addition to its applications to evaluating mitigation actions, this alternative may also apply to evaluating whether water supply alternatives are “practicable”.)

Whether a cost is reasonable or not would be considered in the context of costs of other water projects or habitat restoration actions already performed or planned in the affected watershed; county; or WRIA. In this case a set of “comparable” projects or mitigation actions that have actually been carried out would be identified at the local level. If other parties have been willing to carry out similar projects or mitigation at a given cost, this would provide evidence that the cost is “reasonable.”

It would be important that these comparable actions be matched to the type of applicant involved. For example it may not be appropriate to compare a small town's proposed action with a mitigation action carried out by a state agency or a private developer, since financial resources may be quite different among these categories.

Pros:

- The fact that other parties had actually implemented projects or mitigation actions would provide a suitable basis for concluding that the costs were "reasonable."
- This approach allows direct use of data on mitigation actions by multiple organizations. Thus it is not tied exclusively to a water-user perspective on how costs should be defined.

Cons:

- This approach would be challenging to apply. It may be difficult to find "comparable" projects and mitigation actions, or to determine what the true cost of those actions was. There may be considerable disagreement over whether another project or mitigation action is really comparable to the one proposed.
- Costs may vary widely, making it difficult to select the "right" cost. This could lead to inconsistent outcomes for different applicants.

Recommended Approach

Based on review of these four approaches, staff propose that a representative market value of water rights be defined for the WRIA 25 – 28 planning area (Approach #2). This value will serve as ceiling on "reasonable cost" in order for communities to gain access to their designated water reservations.

This approach is recommended because it best combines attributes of practicality and consistency with the intent of the cost threshold in the mitigation program. Of the approaches considered, this one best matches with the principles defined for cost considerations by the Mitigation Subcommittee.