

WRIA 1 Watershed Management Plan – Phase 1

March 25, 2005

This March 25, 2005 WRIA 1 Watershed Management Plan – Phase 1 has been produced for WRIA 1 Watershed Management Project participants. The document incorporates changes that address the substantive and non-substantive comments submitted by Planning Unit and Staff Team members to the Final Review Draft WRIA 1 Plan. This March 25, 2005 Watershed Management Plan is the document approved by the WRIA 1 Planning Unit on March 23, 2005 and is being forwarded to the Initiating Government legislative bodies, including the Whatcom County Council for approval.

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Blake and Peterson

FINAL

**WATER RESOURCES INVENTORY 1 (WRIA 1)
WATERSHED MANAGEMENT PLAN – PHASE 1**

Submitted to:

WRIA 1 Watershed Management Project Participants

Submitted by:

Sue Blake, Whatcom County Water Resources Division

Becky Peterson, Contractor for WRIA 1 Joint Board

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PREFACE

This draft Water Resource Inventory Area 1 (WRIA 1) Watershed Management Plan – Phase 1 was developed through the cooperative efforts of local stakeholders and governments under the framework provided by the Washington State Watershed Management Act (RCW 90.82). This version of the WRIA 1¹ Watershed Management Plan (WMP) provides a roadmap for addressing water quantity, water quality, instream flow, and fish habitat challenges faced by residents of WRIA 1 now and in the future, with an initial focus on 2005/2006 activities. Its development was based on four fundamental principals: 1) the use of best available science², 2) public participation, 3) collaborative decision-making, and 4) adaptive management. Abiding by these principles requires that the WMP be viewed as a living document that will evolve and develop over time. Continued refinement of technical information will be necessary both now and in the future to respond to existing and new challenges. For this reason, this version of the WMP is referred to as the WMP – Phase 1. Significant elements of implementing this WMP – Phase 1 include completing and integrating the technical assessment tools described in Section 2 into the WRIA 1 decision-making process and implementing the Bertrand Creek and Middle Fork Nooksack River Instream Flow Pilot Negotiations that are elements of the Instream Flow Selection and Adoption Action Plan. Success in meeting the goals of this WMP is dependent on an on-going commitment to ensure plan implementation, review progress, take corrective action, and respond to new needs.

The WRIA 1 Watershed Management Plan – Phase I provides the following information:

- A description of why the WMP was developed and the approach that was used in its development (Section 1);

¹ In 1976, the Washington State Department of Ecology divided the state into 62 water resources inventory areas (WRIAs). WRIA 1 includes the Nooksack River watershed and certain adjacent watersheds including Lake Whatcom.

² For purposes of the WRIA 1 Watershed Management Project, best available science is defined as objective and repeatable analyses based on adequate empirical data collected with appropriate quality assurance/quality control procedures (Memorandum of Agreement, 1998). It is recognized and noted in the WMP - Phase I that achieving best available science is an evolving process dependent upon on-going, long-term data collection and analysis.

- An overview of the actions taken and proposed to build upon and enhance local knowledge about water resource issues and concerns, and to describe the tools being developed to support decision-making regarding management recommendations. This includes a discussion of the interrelationship between the Watershed Planning Process and the resolution of Tribal/Federal reserved water rights and related Treaty-based claims. (Section 2);
- The recommended approach and options for addressing key issues and effectively managing water resources in WRIA 1 (Section 3);
- A description of how the WMP will be implemented and updated including resource considerations (Section 4); and
- A summary of the actions, schedule, and resources needed to implement the WMP (Section 5).

In addition to the Appendices included with the WMP, an expanded glossary of terms and concepts is provided, which can later be used as a companion document. The glossary explains many of the terms referenced in the WMP and has been designed specifically for individuals that may be reading the WRIA 1 Watershed Management Plan - Phase 1 that have not been actively involved in the project.

The WMP-Phase I document has been written with a focus on phasing recommended actions. The information presented in this document focuses on actions that can be accomplished within a two-year timeframe (2005/2006) with known or anticipated resources. The actions in this two-year timeframe represent the WRIA 1 Project work plan that will be pursued upon approval of the WRIA 1 WMP - Phase 1 document. Additional program or project design information is provided at the end of many of the recommended programs and projects. This information is provided to facilitate development of future work plans, WMP modifications, and/or program modifications and is not part of 2005/2006 work plan that will move forward upon WMP approval. Inclusion of this additional program design information should not be interpreted to mean that all WRIA 1 participants agree with the content of the additional information. It is further noted that approval of the

WMP Phase I does not constitute approval of the technical work described in Section 2, much of which is still to be completed and will undergo an independent peer review process. Additionally, due to constraints of time and funding, it has not been possible for all Planning Unit members to submit the Watershed Management Plan for complete review by legal counsel. Actions identified for implementation in 2005 and 2006 were selected based on their relative importance and priority, the need to demonstrate on-the-ground results, their ability to inform future actions, and known or likely resource availability.

ACKNOWLEDGEMENTS

The WRIA 1 Watershed Management Project (WRIA 1 Project) and this associated WMP is the result of extensive work for many years by local and outside participants. Local community members contributed substantial amounts of time and invaluable input through their participation in a multitude of meetings, workshops, and other activities. In particular, caucus participants and their Planning Unit representatives made important contributions throughout the project. Local, State, Tribal, and Federal participants provided substantial staff contributions and direct/indirect funding for the WRIA 1 Project. A very conservative estimate of indirect contributions from staff and community members based on meeting attendance alone is estimated at over 15,000 hours. This does not account for time contributed to review materials, prepare for meetings, follow-up actions, or meet with other caucus members. Whatcom County and the Washington State Department of Ecology played a significant role in direct funding of the WRIA 1 Project through their contributions of approximately \$3.8 million and \$800,000 respectively. The Lummi Nation and Nooksack Tribe provided essential indirect support by obtaining additional federal funding to supplement the technical work associated with the Project. Whatcom County, with assistance from the City of Bellingham, provided administrative support.

Local and outside consulting expertise was provided by the United States Geological Survey, Utah State University, Parametrix Consulting Firm (subconsultants ECONorthwest and Center for Economic and Business Research), Geneva Environmental, Resolution Services, and Anvil Corporation. The Public Utility District No. 1 of Whatcom County added new temporary staff to support a variety of WRIA 1 Project actions. In addition, several of the governments contracted other technical support services that contributed to the WRIA 1 Project.

EXECUTIVE SUMMARY

OVERVIEW

This draft Water Resource Inventory Area 1 (WRIA 1) Watershed Management Plan – Phase 1 (WRIA 1 WMP) was developed through the cooperative efforts of local stakeholders and governments under the framework provided by the Washington State Watershed Management Act (RCW 90.82). The WRIA 1 WMP provides a roadmap for addressing water quantity, water quality, instream flow, and fish habitat challenges faced by residents of WRIA 1 now and in the future, with an initial focus on 2005/2006 activities. It is to be viewed as a living document that will evolve and develop over time with continued refinement of the technical information necessary to respond to existing and new challenges.

The WRIA 1 Watershed Management Plan – Phase I is comprised of five sections and a number of appendices. Information is presented in the following manner:

- Section 1 – This section provides a description of the WRIA 1 Project process and the approach for developing the WRIA 1 WMP;
- Section 2 – Included in Section 2 is an overview of the actions taken and proposed as part of the WRIA 1 Project to build upon and enhance local knowledge about water resource issues and concerns. This section also includes a description of the technical tools being developed to support local decision-making with regard to water resource management issues. Also included in Section 2 of the WRIA 1 WMP is a discussion of the interrelationship between the Watershed Planning Process and the resolution of Tribal/Federal reserved water rights and related Treaty-based claims;
- Section 3 – This section of the WMP focuses on the recommended approaches and options for addressing key issues and managing water resources in WRIA 1;
- Section 4 – This section provides information on the approach for implementing and updating the WMP including resource considerations; and
- Section 5 – Included in this section is a summary of the actions, schedule, and resources needed to implement the WMP.

- Appendices – The appendices include supplemental documents and documentation considered necessary to understand some of the content provided in the five sections of the WRIA 1 WMP.

The Planning Unit approved the WRIA 1 Watershed Management Plan - Phase 1 on March 23, 2005. Legislative acts of those local governments participating in the Planning Unit under which said local governments authorized approval of the WRIA 1 Watershed Management Plan - Phase 1 are compiled in Appendix G of the WRIA 1 Watershed Management Plan -Phase 1. Appendix G is hereby incorporated by reference into the WRIA 1 Watershed Management Plan - Phase 1. Appendix G also includes other actions of Planning Unit members authorizing approval of the Watershed Management Plan – Phase 1.

This Executive Summary is intended to provide an overview of the content for each section of the WRIA 1 WMP- Phase 1. For further detail or expansion of content covered in the Executive Summary, the reader should refer to the full version of the WRIA 1 WMP- Phase 1.

SECTION 1

In 1998, the Washington State Watershed Management Act (Act) legislation was passed and codified as Chapter 90.82 RCW. The specific geographic area covered under the Act is referred to as a “Water Resource Inventory Area”.

The geographic area for which this watershed plan was developed is Water Resource Inventory Area 1 (WRIA 1). WRIA 1 encompasses a majority of Whatcom County with a portion extending into Skagit County. For purposes of the WRIA 1 project, the study area extended into British Columbia because a portion of the WRIA 1 watershed is located in Canada.

In general, the requirements for participation, technical issues, and plan development outlined in RCW 90.82 are divided into four phases: Phase I is an organization phase, Phase II is an assessment phase, Phase III is a plan development phase, and Phase IV is an implementation phase.

The local WRIA 1 Watershed Management Project started in October 1998 after a Memorandum of Agreement was signed by four of the five “Initiating Governments”. The WRIA 1 Initiating Governments are the City of Bellingham, the Lummi Nation, the Nooksack Indian Tribe, the Public Utility District No. 1, and Whatcom County. During the organization phase, the Initiating Governments established the Planning Unit to ensure representation of a broad range of water resource interests. There are 16 caucuses representing government and non-governments water interests on the WRIA 1 Planning Unit. The WRIA 1 Planning Unit recommends approval of the WRIA 1 WMP to the Joint Board. The Joint Board was created by a 1999 Interlocal Agreement and is comprised of representatives of the City of Bellingham, Lummi Nation, Nooksack Indian Tribe, Public Utility District No. 1, and Whatcom County. Pursuant to the October 1998 Memorandum of Agreement, this Interlocal Agreement further formalized the government-to-government relationship essential to the tribes’ participation in the process.

In March 2000, a general scope of work for the WRIA 1 Project was developed by project participants and approved by the Planning Unit and Joint Board. The March 2000 Scope of Work identifies project goals, the technical elements to be addressed (water quantity, water quality, instream flow, and fish habitat), the approach for defining solutions, and elements to be considered for WMP implementation including governance structure, funding, long-term monitoring, and adaptive management.

SECTION 2

Section 2 of the WRIA 1 WMP describes the actions taken and proposed to build upon and enhance local knowledge of water resource issues and concerns. It also describes the tools being developed to support decision-making to address the concerns and to meet the adopted WRIA 1 Project goals (March 2000 Scope of Work). Work was conducted in the following areas: Technical Assessments, Socioeconomic Conditions/Methodology, and Local Perspectives.

- Technical Assessment – Technical assessments were completed for water quality, water quantity, instream flows, and fish habitat. The work undertaken was based

on the goals and requirements identified in the March 2000 WRIA 1 Project Scope of Work. Local and outside expertise was hired to perform the assessments in coordination with WRIA 1 project participants. Section 2 of the WRIA 1 WMP provides detailed summaries of the work performed as part of the WRIA 1 Project as well as the approaches taken for the various tasks. It also includes information on technical work to be completed in 2005, and recommendations for future work. In addition, a list of the reports prepared in response to the technical work is included in the WMP appendices and are available on the WRIA 1 Project website (www.wria1project.wsu.edu).

- Socioeconomic Conditions/Methodology – A task associated with developing the WRIA 1 WMP included hiring a consultant to conduct a socioeconomic analysis for WRIA 1. The purpose of the analysis was to begin developing the tools that would help decision-makers understand the broad range of socioeconomic consequences associated with different management options. The tools developed include a baseline characterization of socioeconomic conditions in WRIA 1, water use and demand assessments, an assessment of methods to analyze non-market goods and services, development of the methodology to analyze impacts of management actions including long-term data collection protocols, and a socioeconomic analysis. Section 2 of the WRIA 1 WMP provides additional detail on the approach for performing the work and the content of the reports generated.
- Local Perspectives – In addition to meeting the WRIA 1 Project goals and requirements, efforts were made to address the needs of the WRIA 1 Project participants. To identify those needs, a number of opportunities and actions were incorporated into the project process including: participation in various groups such as the Staff Team, Technical Teams (Public Involvement and Education, Water Quantity, Water Quality, Instream Flow/Fish Habitat, Decision Support System, and Watershed Plan), Planning Unit, and Joint Board; participation in workshops, symposiums, fairs, and forums; questionnaires completed as part of

the caucus formation and survey work conducted in support of developing the March 2000 Scope of Work; and survey work through the Decision Support System worksheets conducted during the Phase II Technical Assessment work. These activities and opportunities were used to direct the technical and socioeconomic assessment work described in Section 2 as well as the WRIA 1 WMP program recommendations and implementation described in Sections 3 and 4.

SECTION 3

The purpose of Section 3 of the WRIA 1 WMP- Phase 1 is to identify the initial solutions, actions, and alternatives for addressing the key issues identified in Section 2 and the requirements described in the WRIA 1 March 2000 Scope of Work. An overview of the initial solutions and recommended actions are provided below and are discussed in greater detail in Section 3.

- Early Activities – There were two components to the initial solutions: Early Action Projects and Multipurpose Water Storage Assessment. The Early Action projects were on-the-ground projects recommended by caucus members and/or WRIA 1 Technical Team members that addressed known or potential water quantity, water quality, instream flow, and/or fish habitat problems. The recommended projects were evaluated by the Planning Unit and Joint Board against project guidelines established as part of the Early Action process. Two Early Action projects, which are discussed in detail in Section 3, were funded as part of this effort. It is important to note that numerous complementary “Early Actions” were performed and continue to be performed throughout WRIA 1 pursuant to various governmental, private, and non-governmental agency initiatives (e.g., salmon recovery, TMDL implementation). The other early activity occurring as part of the WRIA 1 Project was completion of a WRIA 1 Multipurpose Water Storage Options Assessment. This effort was led by the Public Utility District No. 1 with grant funds received from the Washington State Department of Ecology. The purpose of the assessment was to compile and

reconsider all of the storage options that had previously been identified in studies or plans conducted within WRIA 1 and to receive new ideas on storage options from WRIA 1 participants. The approach to conducting the assessment and the outcomes of the report are provided in Section 3.

- WRIA 1 Management Option Catalog – The WRIA 1 Management Option (MO) Catalog is the outcome of an effort by WRIA 1 participants to document and describe potential management options for addressing water resource management issues. The approach to developing the MO Catalog is discussed in Section 3.
- Instream Flow Selection and Adoption Action Plan – In the adopted March 2000 Scope of Work for the WRIA 1 Project, it was agreed that the existing established instream flows would be re-evaluated as part of the WRIA 1 Project. The purpose of the WRIA 1 Instream Flow Selection and Adoption Action Plan (ISF Action Plan) is to describe the proposed process for re-examining the existing instream flows and for selecting, determining achievability, adopting, and enforcing instream flow levels throughout WRIA 1. The ISF Action Plan is an essential component in achieving the overall goal of the WRIA 1 Project - to have water of sufficient quantity and quality to meet the needs of current and future human generations, including the restoration of salmon, steelhead, and trout populations to healthy and harvestable levels and the improvement of habitats on which we collectively rely. The current draft of the ISF Action Plan, which is included in the WRIA 1 WMP-Phase 1 Appendices, will be used as a guideline to implement Instream Flow Pilot Negotiations within WRIA 1. The information learned in the Pilot Negotiation process will be used to modify the ISF Action Plan over time. The Instream Flow Pilot Negotiations will be the focus of implementation actions for the WRIA 1 Project 2005-2006 Work Plan, which is described in Section 5. Section 3 provides detailed information on the approach to developing the ISF Action Plan as well as the process for approaching the ISF Pilot Negotiation projects.
- WRIA 1 Pilot Projects, WRIA-Wide Programs, and Other Recommendations – Section 3 of the WRIA 1 WMP-Phase 1 identifies a number of recommendations for projects and programs to address issues identified in Section 2 of the WMP. The approach for

identifying the projects and programs varied and is discussed in detail in Section 3. In all cases, opportunities were provided to WRIA 1 participants to identify, formulate and/or comment on recommended projects and programs. Following are the projects and programs described in Section 3.6 and 3.7.

- ◆ Drainage Based Management
- ◆ E. Hemmi Neighborhood Wetland and Stream Restoration
- ◆ Ground Water Augmentation of Streamflow
- ◆ Low Impact Development Facility and Road Pilot Projects – 1) Whatcom County Facility and Road Projects and 2) Guide Meridian Road Project
- ◆ Compliance Program
- ◆ Low Impact Development (LID)
- ◆ Natural Resource Policy Integration
- ◆ Water Use Efficiency
- ◆ Public Involvement and Education
- WRIA 1 Long Term Monitoring Program – The purpose of the WRIA 1 Long-Term Monitoring Program (LTMP) is to evaluate WRIA 1 Project success, and ensure that the WRIA 1 Project goals outlined in the March 2000 Scope of Work are met. The LTMP serves as a fundamental building block to the WRIA 1 Project by providing on-going information on the status of various water resource concerns, potential trends, causes/sources of problems, and the effectiveness of management actions. The approach to pursuing this program is outlined in Section 3.

SECTION 4

One of the fundamental premises upon which the WRIA 1 Project was developed, is the recognition that effective water resource management required a commitment extending beyond the development of the Watershed Management Plan itself. Section 4 of the WRIA 1 WMP- Phase 1 describes actions being recommended to address considerations outlined in the March 2000 Scope of Work relative to ensuring plan implementation. Included in the

described actions are an implementation and adaptive management strategy. The implementation strategy recommended is a multi-staged approach that considers resource needs for the short and long term implementation. The adaptive management strategy provides a very simplistic illustration of the strategy conceived as part of the March 2000 Scope of Work.

SECTION 5

A summary of implementation actions, resource needs, schedule, and recommended lead entities is provided in Section 5. The focus of the implementation schedule is on actions that can be achieved within a two year timeframe (2005-2006) with existing and anticipated resources. Included in the tasks outlined are efforts directed toward obtaining additional funding through state grants, federal appropriations, and securing local funds.

SECTION 1

INTRODUCTION

Residents of Water Resources Inventory Area 1 (WRIA 1) are faced with an increasing number of challenges related to water resources, despite what at times appears to be an abundant resource. These challenges include limited water supplies to meet current and future needs, water quality degradation, the resolution of Tribal/Federal reserved water rights and related Treaty-based claims, and endangered species listings for Chinook salmon and bull trout. Left unresolved, these issues will have a broad and far-reaching affect on the economic, social, and environmental health of the community.

Over the years, there have been many different planning efforts undertaken to address these problems. Typically, these efforts have been of limited scope (e.g., water quality or water quantity), geographic area, participation, and duration. Although through these efforts progress has been made in some areas, several challenges and problems remain unresolved. Many of these challenges are integrally linked to each other. Solving them requires a long-term commitment along with widespread government and community participation.

In 1998, a new opportunity to provide widespread involvement in comprehensive water resource management was created with the passage of the Washington State Watershed Management Act (Act) codified as Chapter 90.82 RCW. Through this Act, local stakeholders and governments were empowered to work together to better understand the nature and extent of the water resource management problems and to develop a plan to address them. They were also encouraged to use the process embodied in the Act to avoid contentious litigation involving the future exercise of both tribal and non-

Key Challenges:

- Adequate water supplies for instream (fish) and out-of-stream (domestic, agriculture, municipal, commercial, industrial) needs
- Endangered species listings
- Clean Water Act violations
- Public health concerns associated with drinking water supplies and shellfish
- Uncertainty regarding unquantified tribal water rights and implications for water management and uses
- Community education, involvement, and stewardship
- Adequate data and tools to assess conditions, identify trends, evaluate causes, and determine effectiveness of management actions
- Enhanced coordination between land use management and water resources management
- On-going community and government participation and funding to support comprehensive management

tribal water rights. As discussed later in this WMP, this important purpose has been advanced by linking the WRIA 1 Watershed Management Project, and in particular the flow-setting process, to the resolution of Tribal/Federal reserved water right and Treaty-based claims through the proposed use of the Federal Negotiation Process.

Participation in the Watershed Planning process under the Act was voluntary. However, for jurisdictions that chose to participate, the Act lays out general requirements that must be followed including geographic areas that must be covered, who must participate, technical issues to be considered, and plan development considerations.

The specific geographic area that must be covered is referred to as a “Water Resource Inventory Area” or WRIA (pronounced “why-ruh”). There are 62 WRIs throughout Washington State. The majority of Whatcom County is in WRIA 1 with a portion extending into Skagit County. For purposes of this Plan, the study area was extended into British Columbia because a portion of the WRIA 1 watershed is located in Canada (Figure 1.1)

In general, the requirements for participation, technical issues, and plan development outlined in RCW 90.82 are divided into 4 phases. Phase I is an organization phase, Phase II is an assessment phase, Phase III is a plan development phase, and Phase IV is an implementation phase.

Phase I – Organization:

The purpose of the organizational phase was to establish a process and general scope of work to identify who will participate and what topics will be addressed. The Act identifies two participating bodies for purposes of developing a watershed plan: the Initiating Governments and the Planning Unit. The Initiating Governments include all counties within

What is a WRIA?

A Water Resource Inventory Area (WRIA) is a geographic boundary created by the State to assist in the management of water resources. In 1971, the Washington State legislature passed Chapter 90.54 RCW, the Water Resources Act of 1971. This Act directed the Department of Ecology to develop a “comprehensive state water resource program” and said that “the department may develop the program in segments” in order to focus on specific areas or issues. In 1976, Ecology adopted Chapter 173-500 WAC, which split the State into 62 Water Resource Inventory Areas.

The geographic area of WRIA 1 includes the Nooksack River watershed and certain adjacent basins (including Lake Whatcom) that discharge to the marine waters of Georgia Strait and Puget Sound or to the Fraser River system in Canada.

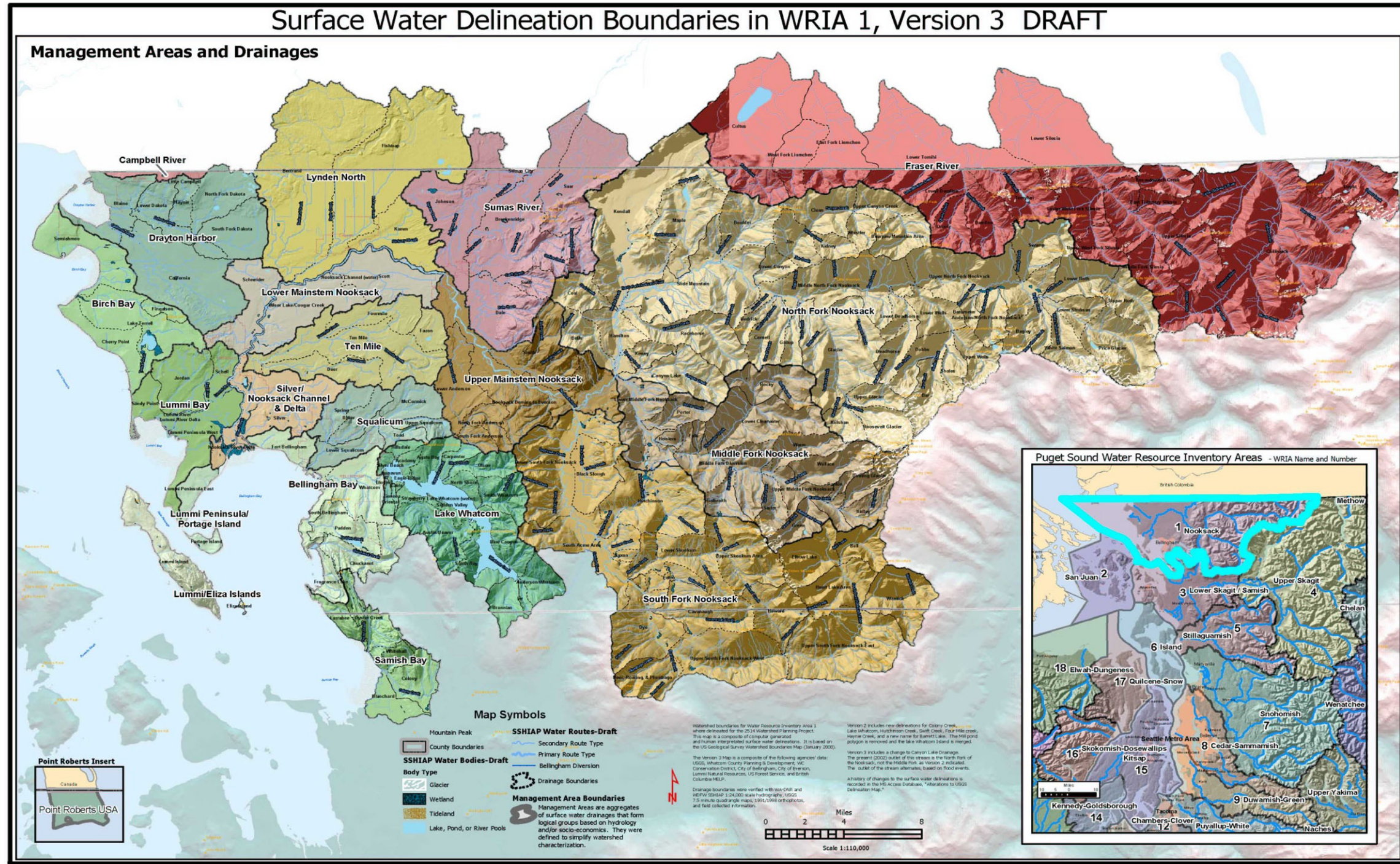


Figure 1.1: Map of WRIA 1 and general information about the area.

WRIA 1 Facts & Figures

Size:

WRIA 1 (excluding British Columbia) is 1,410 square miles of which 81 square miles are located in Skagit County. An additional 381 square miles are located in Canada. By comparison, Whatcom County is 2,142 square miles.

Land Uses:

The mountainous eastern portion is dominated by federal forestlands, while the western lowlands support agriculture, rural development, forestry, and urban development in seven cities.

Population:

WRIA 1 is home to over 164,000 people and many species of fish and wildlife. Of the human population, 1,000 are located in Skagit County, 78,040 in Bellingham, 4,779 in Blaine, 2,256 in Everson, 9,934 in Ferndale, 9,064 in Lynden, 895 in Nooksack, 995 in Sumas, and 60,311 in the unincorporated area (ECONorthwest, 2002). The annual growth rate for Whatcom County has varied between 1.5% and 2.7%.

Water Resources:

There are numerous surface and groundwater resources in WRIA 1. The WRIA has over 1,000 miles of rivers of which the Nooksack River system is largest, draining 826 square miles westward into Bellingham Bay. The Fraser and Sumas systems flow northward into Canada. Lake Whatcom is the largest lake covering 5,000 acres in area. The western boundary of WRIA 1 borders over 130 miles of marine shoreline.

Water Use:

These irreplaceable water resources provide water for fish/wildlife, drinking, agriculture, commercial/industrial needs, recreation, hatcheries, hydropower, and aesthetics.

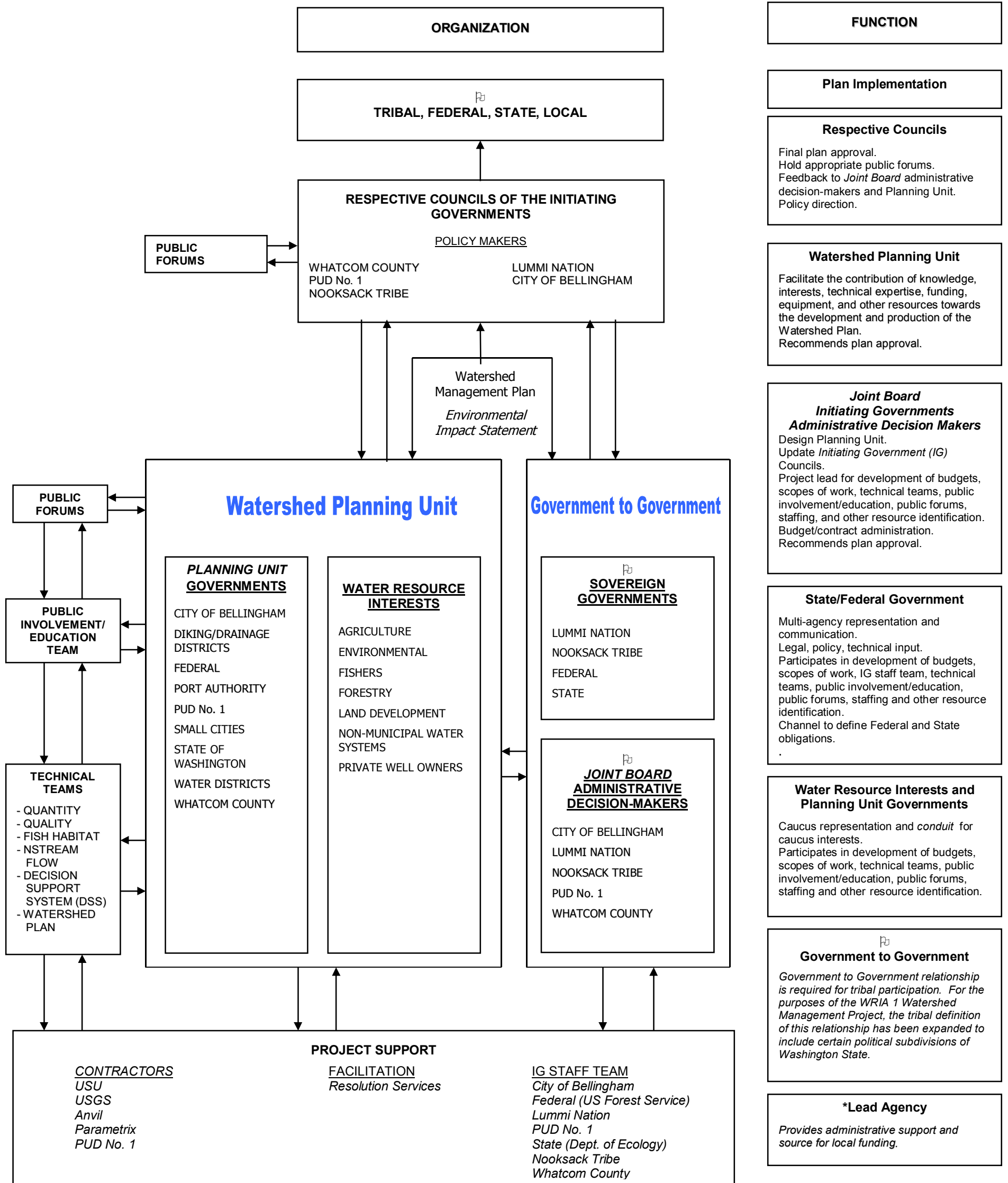
the WRIA, the largest city or town within the WRIA, and the water supply utility obtaining the largest quantity of water from the WRIA. In addition, Indian tribes with reservation lands within the WRIA may also choose to participate in the process as an Initiating Government. The Initiating Governments in WRIA 1 are the Public Utility District No. 1, Lummi Nation, Nooksack Tribe, Whatcom County, and the City of Bellingham. In October 1998, a Memorandum of Agreement (MOA) was signed by all of the Initiating Governments except the Nooksack Tribe formalizing the partnership in the WRIA 1 Project.

The Initiating Governments were responsible for setting up a Planning Unit to ensure representation of a broad range of water resource interests and governments. The Initiating Governments decided to achieve this representation using a caucus structure. After obtaining public comment on a January 1999 proposed structure and function document (Appendix A) negotiated by the Initiating Governments, a Planning Unit comprised of 16 caucuses was created in May 1999. Figure 1.2 is a structure and function diagram of the Watershed Plan development phase of the

WRIA 1 Watershed Management
Project Goals

- General - To have water of sufficient quantity and quality to meet the needs of current and future human generations, including the restoration of salmon, steelhead, and trout populations to healthy harvestable levels, and the improvement of habitats on which fish and shellfish rely.
- Water Quantity - To assess water supply and use, and develop strategies to meet current and future needs. The strategies should retain or provide adequate amounts of water to protect and restore fish habitat, provide water for future out-of-stream-uses, and ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth under the requirements of the state's Growth Management Act.
- Water Quality - To ensure that the quality of our water is sufficient for current and future uses, including restoring and protecting water quality to meet the needs of salmon and shellfish, contact recreational uses, cultural uses, protection of wildlife, providing affordable, safe domestic water supplies, and other beneficial uses. The initial objectives of the water quality management strategy will be to meet the water quality standards.
- Instream Flow - To supply water in sufficient quantities to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve habitats on which fish rely.
- Fish Habitat – To protect or enhance fish habitat in the management area and to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve habitats on which fish rely.

WRIA 1 Watershed Management Plan Development Structure & Function



Initiating Governments

Lummi Nation

Public Utility District No. 1

Whatcom County

City of Bellingham

Nooksack Tribe

WRIA 1 Project¹ The 16 caucuses of the WRIA 1 Planning Unit are representatives from agriculture, diking and drainage, environmental, fishers, forestry, land development, non-government water systems, private wells, small cities, water districts, Port of Bellingham, Washington State (represented by the Department of Ecology), the U.S. Forest Service as well as three of the Initiating Governments (Bellingham, Whatcom County, PUD No. 1). Each representative is intended to represent a broader constituency of members with similar water resource interests and/or perspectives (caucus). The Planning Unit has actively participated in all phases of the WRIA 1 Watershed Management Project. It has generally met on a monthly basis with additional opportunities for members to participate on technical teams/work groups that were created to support Phases II and III of the WRIA 1 Project (Technical Assessment and Planning). The Act specifies that the Planning Unit will develop and approve the Watershed Management Plan and recommend the Plan to the Whatcom County Council for adoption.

The Planning Unit approved Watershed Management Plan will first be recommended to the Joint Board for approval. The Joint Board, created by a 1999 Interlocal Agreement to further formalize the government-to-government relationship with the two Indian tribes in WRIA 1, is comprised of representatives of the Lummi Nation, Nooksack Tribe, City of Bellingham, Whatcom County, and Public Utility District No. 1 of Whatcom County. The Joint Board is responsible for administering the WRIA 1 Watershed Management Project's contracts and budgets and providing direction to the Initiating Governments' staff.

The issues to be addressed under the Act must include water quantity, but may also include water quality, instream flows, and fish habitat. An early decision made by WRIA 1 Project participants was to include all four elements because they are inseparable. All of these elements are physically, chemically, and biologically interconnected and comprehensive water resource management requires that they all be addressed. They are

¹ The diagram shown as Figure 1.2 is the May 2002 Revised Structure and Function Diagram, which was reviewed but not approved by the WRIA 1 Planning Unit. The May 2002 diagram was slightly modified from the approved diagram included in Appendix A and more accurately reflected the process as it currently functions.

also integral to resolving, protecting, and advancing the Lummi Nation and Nooksack Tribe's respective Federal reserved water rights and related Treaty-based claims.

The general scope of work for the WRIA 1 Watershed Management Project was developed by Project participants and formally adopted by the Planning Unit and Joint Board in March 2000. The scope of work was based on the requirements of the Act, and the MOA signed by the Initiating Governments in October 1998. It also included requirements associated with grant funding obtained from the Washington State Department of Ecology to support all phases of work. The March 2000 Scope of Work (SOW) identified project goals, the technical elements to be addressed (water quantity, water quality, instream flow, fish habitat), the approach for developing solutions, and elements to be considered for plan implementation, including governance structure, funding, long-term monitoring, and adaptive management. Requirements contained in the March 2000 Scope of Work are referenced throughout this WMP. The general scope of work was used to guide the development of more detailed scopes of work associated with different phases of the Project. In some cases the more detailed scopes of work included actions that extended beyond the minimum requirements of the Act. The March 2000 Scope of Work can be found at the WRIA 1 Project website at www.wria1project.edu and is included in Appendix B.

Phase II – Assessment:

The purpose of the assessment work is to enhance local knowledge about water resource issues and concerns, and to develop the tools necessary to support decision-making regarding management recommendations to address the concerns. Assessment work was initiated early in the WRIA 1 Project and was conducted under agreements with the United States Geological Survey, Utah State University, and others. Local participants in the WRIA 1 Project, federal agencies, outside consultants, and other technical experts contributed to the assessments. A key approach to involving local participants was through the establishment of technical teams, which provided an on-going interface between outside consultants and local Project participants. Section 2 of this plan describes the current state of the technical assessments and findings, and identifies key issues to be addressed in WRIA 1. Further information on the technical assessment work is provided on the WRIA 1 Project website – www.wria1project.wsu.edu.

Phase III – Planning:

Watershed Management Plan development was formally initiated in 1999. As with the technical assessment, extensive participation of both WRIA 1 participants and outside consulting expertise was utilized to develop recommendations for solutions to key issues and to develop the implementation strategy. Section 3 of the WMP provides details on the approach and describes specific actions the WRIA 1 participants are taking and plans they are developing to address the key issues. This section also includes plans for long-term monitoring to address data/information gaps, build on existing databases, and to ensure accountability and foster progress toward WRIA 1 Project goals and objectives. Section 4 describes the implementation strategy, including how participating governments and interest groups will work together to implement this WMP once it is approved. It also includes an adaptive management strategy for adjusting implementation of the plan elements as needed to meet the goals and objectives of the Watershed Management Project. Section 5 provides a summary of the actions, schedule, and resources needed to implement the WMP.

Project Support:

Development of the WRIA 1 Watershed Management Plan and associated technical assessment work has required extensive additional support that has included:

- Meeting Facilitation and Documentation - Most WRIA 1 Project meetings have written summaries to document actions taken and decisions made by meeting participants with consultants providing much of this support. This information is retained as part of the formal record for the Project and is on file at the Whatcom County Water Resource Division office.
- Public Involvement and Education - Education and involvement of the community in the WRIA 1 Project is critical. To a large degree, Planning Unit caucuses have been relied upon to provide a primary link to their respective interest groups and

Public Education and
Involvement Actions

- www.wria1project.wsu.edu
- Maintain Calendar of Events on WRIA 1 Project Website
- WRIA 1 Project Freshsheets
- WRIA 1 Project Newspaper Insert
- Public Meetings and Workshops
- Public Service Announcements at Movie Theaters
- Annual Presence at Northwest Washington Fair

governments. Funding was made available by Whatcom County as part of the WRIA 1 Project to assist them in that effort. In addition, recognizing that participation through caucuses may not be possible for all interested members of the community, other actions were taken to provide opportunities for education and input to the WRIA 1 Watershed Management Plan. In January 1999, the Administrative Decision-Makers created a Public Involvement and Education (PIE) Technical Team. The PIE Technical Team, composed of members of the Initiating Governments and Planning Unit, developed an overall strategy for PIE activities. The strategy was adopted by the Planning Unit and has been implemented and updated throughout the WRIA 1 Project.

- Project Administration – Whatcom County, the City of Bellingham, and the Public Utility District No. 1 have provided support to the Joint Board for project administration.

Phase IV-

Implementation

As described later in the document, implementation of water resource management activities was initiated as part of this project beginning in 2000. Additional implementation activities will occur once this WRIA 1 Watershed Management Plan is adopted.

Planning Unit Approval

The Planning Unit approved the WRIA 1 Watershed Management Plan - Phase 1 on March 23, 2005. Legislative acts of those local governments participating in the Planning Unit under which said local governments authorized approval of the WRIA 1 Watershed Management Plan - Phase 1 are compiled in Appendix G of the WRIA 1 Watershed Management Plan -Phase 1. Appendix G is hereby incorporated by reference into the WRIA 1 Watershed Management Plan - Phase 1. Appendix G also includes other actions of Planning Unit members authorizing approval of the Watershed Management Plan – Phase 1.

SECTION 2 ASSESSMENTS, PROBLEM IDENTIFICATION, AND FINDINGS

2.1 PURPOSE

The purpose of this section is to describe actions taken and proposed to build upon and enhance local knowledge about water resource issues and concerns. The section also describes the tools being developed to support decision-making regarding management recommendations to address the concerns and meet the adopted goals. Toward that end, work was conducted in the following areas:

- Technical Assessment - Technical assessments and studies were conducted for water quality, water quantity, instream flows, and fish habitat based on the goals and requirements identified in the WRIA 1 Project March 2000 Scope of Work and needs of the Project participants. A fundamental part of this work is the development of a computer-based decision support system (DSS) that will help decision-makers evaluate the impact of various management actions on water quality, water quantity, instream flow, and fish habitat;
- Socioeconomic Conditions/Methodology -Socioeconomic work was conducted to characterize baseline conditions and to identify approaches for evaluating the socioeconomic impacts associated with various management actions; and
- Local Perspectives - On-going efforts were made to identify the issues and interests that were important to local Project participants in order to guide the work conducted.

All of these elements – technical assessments, socioeconomic conditions, and local perspectives – provide the foundation for knowledge-based decision-making and were used to help identify the key issues, shape the technical tools developed to support decision-making, and identify the management actions recommended in Section 3.

This Section provides information on the following:

- *General overview of the type and purpose of the work conducted (2.1);*
- *General overview of methods and approach used to conduct the work (2.2);*
- *Specific methods, findings, next steps identified in the various studies (2.3);*
- *Technical oversight/validation process (2.4); and*
- *Public access to the reports and studies generated (2.5).*

2.2 Approach

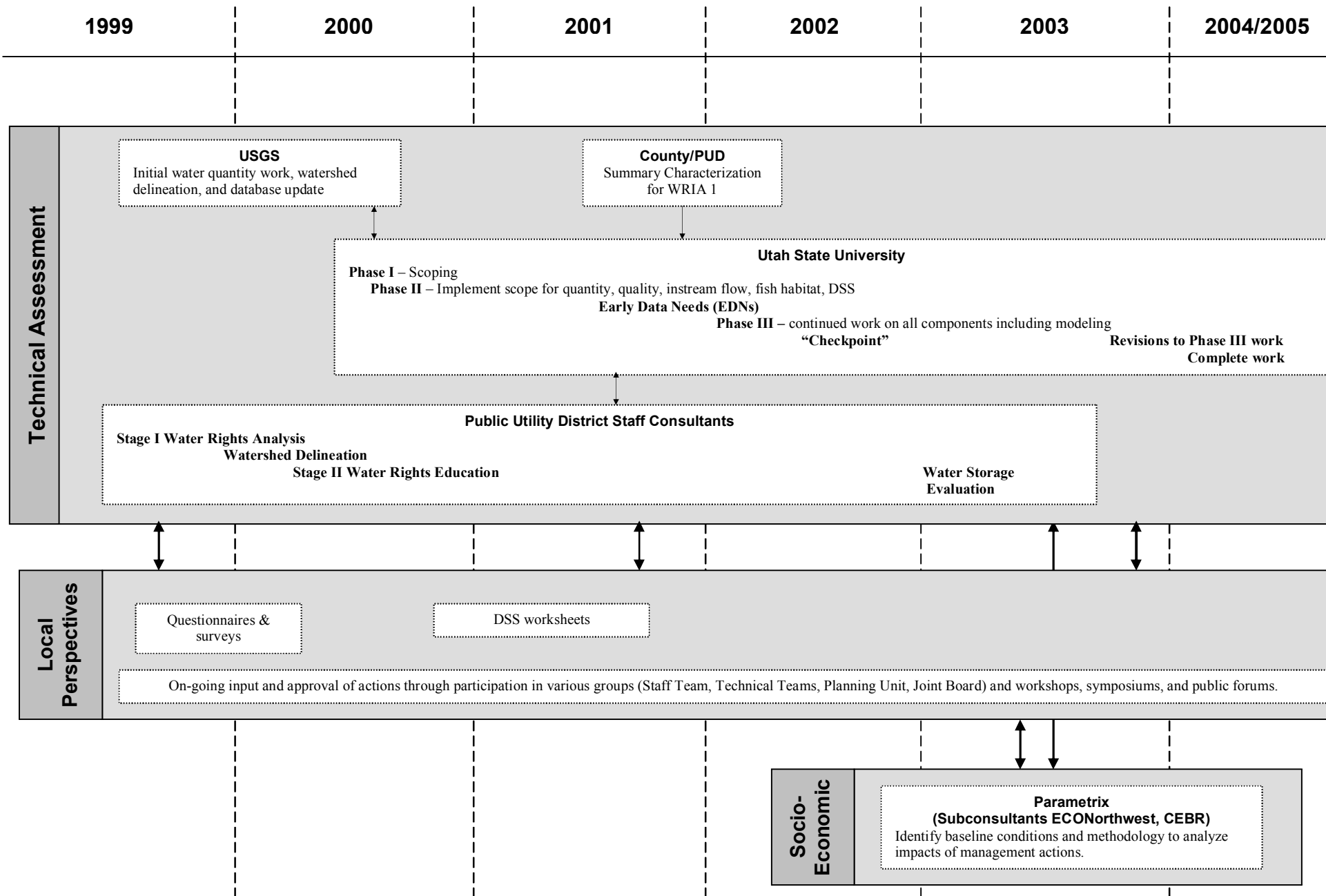
A variety of methods and parties were involved in gathering information related to Technical Assessment, Socioeconomic Conditions, and Local Perspectives. Figure 2.1 provides a general overview of who was involved in the work for each area and the timeline. The Figure illustrates the on-going interaction between local Project participants and consultants that was required to conduct the work. This on-going interaction enabled a phased approach to be used – allowing future actions to be considered in light of what was learned in previous steps, available resources, and timeline constraints. A brief overview of the actions taken in each area is provided here, with additional details and findings presented in Section 2.3.

Technical Assessment

In order to perform the technical work, local and outside expertise was hired to work in coordination with WRIA 1 Project participants. As can be seen in Figure 2.1, the United States Geological Survey (USGS) conducted the initial work related to water quantity. The USGS also participated in scoping discussions leading up to work with Utah State University (USU). USU has been responsible for conducting the majority of the technical assessment work for each component (water quality, water quantity, instream flows, and fish habitat) and developing the DSS. Contract staff with Public Utility District No. 1 (PUD 1) provided key support in a number of areas including state-based water rights, watershed delineation, and a water storage evaluation that will be discussed in Section 3.

At this time, the technical assessment phase is not finished and is scheduled to be completed by December 2005. Interim products supporting implementation of this Watershed Management Plan will be available in the coming months. The technical assessment work includes development of a decision support system and socioeconomic analysis methodology that can be used to support future decision-making. The decision support system will enable the technical implications of different management actions to be evaluated (e.g., impacts on water quality, water quantity, instream flows, and fish habitat). The socioeconomic analysis provides direction on how to evaluate the socioeconomic implications of different management actions (e.g., how an action may affect jobs and cultural values). These tools will not make decisions rather they provide information to those responsible for making decisions so they can understand the implications of various management actions and make knowledge-based decisions.

Figure 2.1: Overview of assessment work, parties involved, and timeline.



The USU technical work began in June 2000 and was conducted in phases – Phase I, Phase II, Early Data Needs, and Phase III. The phased approach was taken for two primary reasons: 1) it could be scheduled to accommodate budget cycles, and 2) it provided for opportunities to adjust or modify technical work in an upcoming phase based on what was being learned and the evolving understanding of relevant issues by WRIA 1 participants.

The first phase of USU work (Phase I) was an initial scoping phase. Phase I provided the USU scientists and WRIA 1 participants information needed to develop the scope of work for the Phase II technical studies. Work under Phase II focused on accumulating, evaluating, and analyzing the available data for surface water quality and quantity, ground water quality and quantity, instream flows, fish habitat, development of a database management structure, and preliminary structure of a decision support system (Hardy et al., 2002).

As Phase II neared completion, WRIA 1 participants and USU scientists began scoping for Phase III technical work¹. During the scoping process, it became clear that more time than originally expected would be required to develop the Phase III scope of work given the need for WRIA 1 participant input. During the process of prioritizing work to be undertaken as part of Phase III, interim actions were identified that included time-critical tasks that were known to be needed for Phase III. These interim actions were termed Early Data Needs and were adopted and initiated prior to completing the Phase III scope of work.

Another activity undertaken during the interim period of USU's Phase II technical work and the initiation of their Phase III work was that WRIA 1 Project staff from Whatcom County and Public Utility District No. 1 developed a draft Watershed Characterization Report. The report was an additional tool to assist WRIA 1 Project participants in determining what should be included in the Phase III SOW. The draft Characterization Report provided a "snapshot" of current water resource conditions and challenges in the WRIA 1 study area. The report built upon and integrated information from a variety of sources, including past work, current WRIA Project studies, and information from community members.

During the Phase III scoping process extensive discussions occurred regarding what were called "Detailed Management Areas" or DMAs. A DMA is a drainage or aggregate of drainages for which data and modeling resolution are relatively good for defining

¹ The USU Phase II scope of work included preliminary recommendations for what should occur in Phase III. These preliminary recommendations were reviewed and modified based on what was learned in Phase II, funding/schedule considerations, and the perspectives of local project participants.

existing conditions and problems, and for predicting effectiveness of potential solutions for identified problems. The concept of a “detailed management area” evolved for a number of reasons including:

- It was recognized that not all areas have sufficient data on which to base management decisions;
- Resources were not available to obtain the same level of information in all areas; and
- Selecting a smaller number of areas in which to focus higher resolution work could serve as pilots for expanding work into other areas.

The discussions resulted in several DMAs being identified. Section 2.3 provides additional details on the location and nature of this work.

The USU Phase III work began in May 2002 and is scheduled for completion in 2005. Key elements of USU’s Phase III work are: 1) completing the analytical models and tools for each area of the study, and 2) tying the models together into the decision support system (DSS). A “checkpoint” was built into the Phase III Scope of Work that enabled USU staff and WRIA 1 Project participants to evaluate progress and determine if any changes were needed to the Phase III work. Based on the outcomes of the checkpoint evaluations, recommended revisions were made to the Phase III Scope of Work and approved by the Planning Unit in December 2003 and the Joint Board in March 2004.

Socioeconomic Conditions/Methodology

In the spring of 2002, Parametrix was selected and contracted to assist WRIA 1 participants to develop the WRIA 1 Watershed Management Plan. One of the tasks included in the Parametrix scope of work was to conduct a socioeconomic analysis. The purpose of the analysis was to begin developing the tools that would help decision-makers understand the broad range of socioeconomic consequences associated with different management options. The work included providing a baseline characterization of socioeconomic conditions in WRIA 1, water use and demand assessments, an

assessment of methods to analyze non-market goods and services, development of the methodology to analyze impacts of management actions including long-term data collection protocols, and a socioeconomic analysis. Parametrix subcontracted with ECONorthwest (ECO) and the Center for Economic and Business Research (CEBR) at Western Washington University to perform the socioeconomic work.

Local Perspectives

A successful watershed management plan requires both meeting the WRIA 1 Project's adopted goals and requirements and addressing the individual needs of Project participants. In order to identify those needs, a number of opportunities and actions were incorporated into the process including:

- Participation in various groups including the Staff Team, Technical Teams (Water Quantity, Water Quality, Instream Flow, Fish Habitat, Decision Support System, Watershed Plan, Public Involvement and Education), Planning Unit, and Joint Board.
- Participation in workshops, symposiums, fairs, and forums;
- Questionnaires that were filled out during caucus formation and survey work conducted in support of developing the WRIA 1 Project March 2000 Scope of Work; and
- Survey work (referred to as DSS Worksheets) conducted during the Phase II Technical Assessment.

These activities and opportunities were used to direct both the technical and socioeconomic assessment work described in this Section of the WMP, as well as the management actions and implementation strategy described in WMP Sections 3 and 4. It is important to note that not all issues of interest to the various caucuses may have been addressed in this WRIA 1 Watershed Management Plan- Phase 1. However, consistent with the adaptive management principles described in the WRIA 1 March 2000 Scope of

Work and in the approach described in Section 4 of this document, outstanding issues will continue to be considered for action as resources become available.

2.3 Summary of Specific Methods, Key Findings, and Next Steps

This section provides a summary of the technical assessments, socioeconomic conditions, and local perspective work conducted for the WRIA 1 Project. Technical assessment work is discussed first, followed by socioeconomic conditions/methodology, and local perspectives. Each section includes a discussion of what was done and how, key findings, and, where appropriate, next steps.

2.3.1 Technical Assessment

The technical assessment work is divided into seven main areas: 1) watershed delineation, 2) land cover, 3) water quantity, 4) water quality, 5) instream flow, 6) fish habitat, and 7) decision support system. Within each area, background information is provided along with methods/results, and next steps. The background information includes a description of the technical assessment requirements identified in the WRIA 1 Project March 2000 Scope of Work, where applicable. Although the methods and results from Phase II technical assessments are summarized in this section of the Watershed Management Plan – Phase 1, the reader should remember two key points: (1) the methods and results from the Phase II technical assessment work are preliminary and in numerous cases are being revised/revisited as part of the on-going Phase III technical work, and (2) the actual Phase II reports cited in this section contain substantial amounts of information that is not presented in this overview.

2.3.1.1 Watershed Delineation

Background

In order to ensure that there was a common understanding of the geographic area defined as WRIA 1 and to which the assessment work and management actions would apply, actions were taken early on to identify and refine the WRIA 1 boundaries. This included examining the external surface water boundaries of WRIA 1, subdividing the

WRIA into smaller agreed-upon surface water drainages, and developing common terminology to use in referring to the areas.

Methods/Results

Initial watershed delineation work was conducted by the USGS and resulted in a map called *Watershed Boundaries Delineated from Digital Elevation Model*, May 2000. This map, along with other maps already in use by other agencies and organizations², were examined by a subcommittee of the WRIA 1 Water Quantity Technical Team (Subbasin Subcommittee) established through the WRIA 1 process.

While the maps had many features in common, it was agreed that none met the needs of the WRIA 1 Project and additional work was needed. Reasons for the additional work included varying degrees of differences in watershed boundaries when the maps were overlaid upon each other, not enough smaller drainages delineated within the overall WRIA boundary, and/or they were not complete for the entire WRIA.

The Subbasin Subcommittee was charged with developing a map and common terminology that would meet the needs of the WRIA 1 Project and could be agreed to by participants. The Subbasin Subcommittee was comprised of representatives from the following initiating governments and caucuses: PUD No. 1 of Whatcom County, Lummi Nation, Whatcom County, Washington State Department of Ecology, Fishers Caucus, Agriculture Caucus, Forestry Caucus, and the Private Well Caucus. The Subbasin Subcommittee reviewed and discussed options and criteria for designating size of drainages, naming systems, level of accuracy needed, and compatibility with other agencies.

Using a geographic information system (GIS), existing boundaries were overlaid and compared for accuracy and agreement. After performing this task, it was established that the recent USGS map was most accurate in areas with topographic relief. In the flat

² The other maps included those developed by Whatcom County Planning and Development, Whatcom Conservation District, City of Bellingham, City of Everson, Lummi Nation Natural Resources, US Forest Service, and British Columbia Ministry of Environment, Lands, and Parks

areas, the Whatcom County and Conservation District maps were referenced because the maps reflected local knowledge of the drainage characteristics in those areas. In the upland areas, the US Forest Service and City of Bellingham maps were used because they reflected accurate representation of smaller drainages. Ancillary data were used to review complex topographical areas where multiple existing maps diverged from the base USGS map or where boundaries crossed a stream.³ Volunteers field checked the boundaries in areas that could not be determined solely by reviewing maps. The field check involved using the maps with conflicting watershed boundaries and streams and overlaying an aerial photograph to help identify the boundary that most closely represented the true topographic divide.

The next step in the process was to name the delineated areas. To the extent possible, names from existing maps were used. If there was not an existing name, one of the following methods was used:

- If a named stream is present along with unnamed streams, the delineation was named after the named stream.
- If tributaries of the same stream are delineated separately, the nested composite name should not be repeated as one of the smaller sub unit names if possible.
- If the delineated area includes more than one unconnected stream with one named stream, then the word “area” will be added to the delineation name.
- If there are no named streams inside the delineation, a land form (like a mountain) or cultural name like closest town or historic settlement was used.

Finally, the Subbasin Subcommittee evaluated approaches to assigning a naming convention to the delineations so that they imply a relative size. Many federal and state examples were studied, but were not felt to be appropriate for WRIA 1. There is no common protocol for delineation terminology so one was adopted from Bruce P.

³ WA-DNR 1-24,000 scale hydrography, SSHIAP 1:24k hydrography, 1991/1998 orthophotos, and USGS 7.5 Minute Quadrangle Maps were used in this step.

McCammon’s paper *Recommended Watershed Terminology*. The paper describes the proposed terminology to be adopted by the US Forest Service, Natural Resource Conservation Service, US Environmental Protection Agency, and US Geological Survey.

The final agreed upon boundaries were presented to the Planning Unit, on May 24, 2000, in the form of a map-*WRIA 1 Surface Water Drainage Boundaries Version 1*. The map has been updated since its original adoption with Version 3 being the most current (Figure 2.2). Version 3 has 177 delineations stretching from British Columbia, southward into Skagit County. Each of the 177 delineations has a name, however, not all names are included on Figure 2.2.

In terms of the naming convention relative to size, the convention adopted in WRIA 1 has less to do with size than it does with how the delineated area is contained or “nested” in a larger delineation (Figure 2.3). The delineated area that is broadest and most inclusive of branches and tributaries is called a basin with the “smallest” portion of the larger area called a drainage.

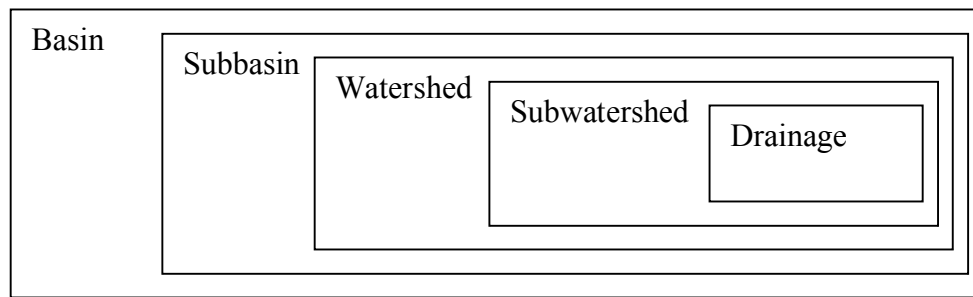


Figure 2.3: Graphical representation of the naming convention used by WRIA 1 to describe the nesting of watersheds.

- Basin – While the size of a basin varies widely, this is the largest surface water delineation in the WRIA 1 hierarchy. There are several basins in WRIA 1: the Nooksack River Basin, which drains largely into Bellingham Bay; portions of the Fraser River Basin, which drain into Canada; and coastal basins, which contain numerous small watersheds that drain directly into

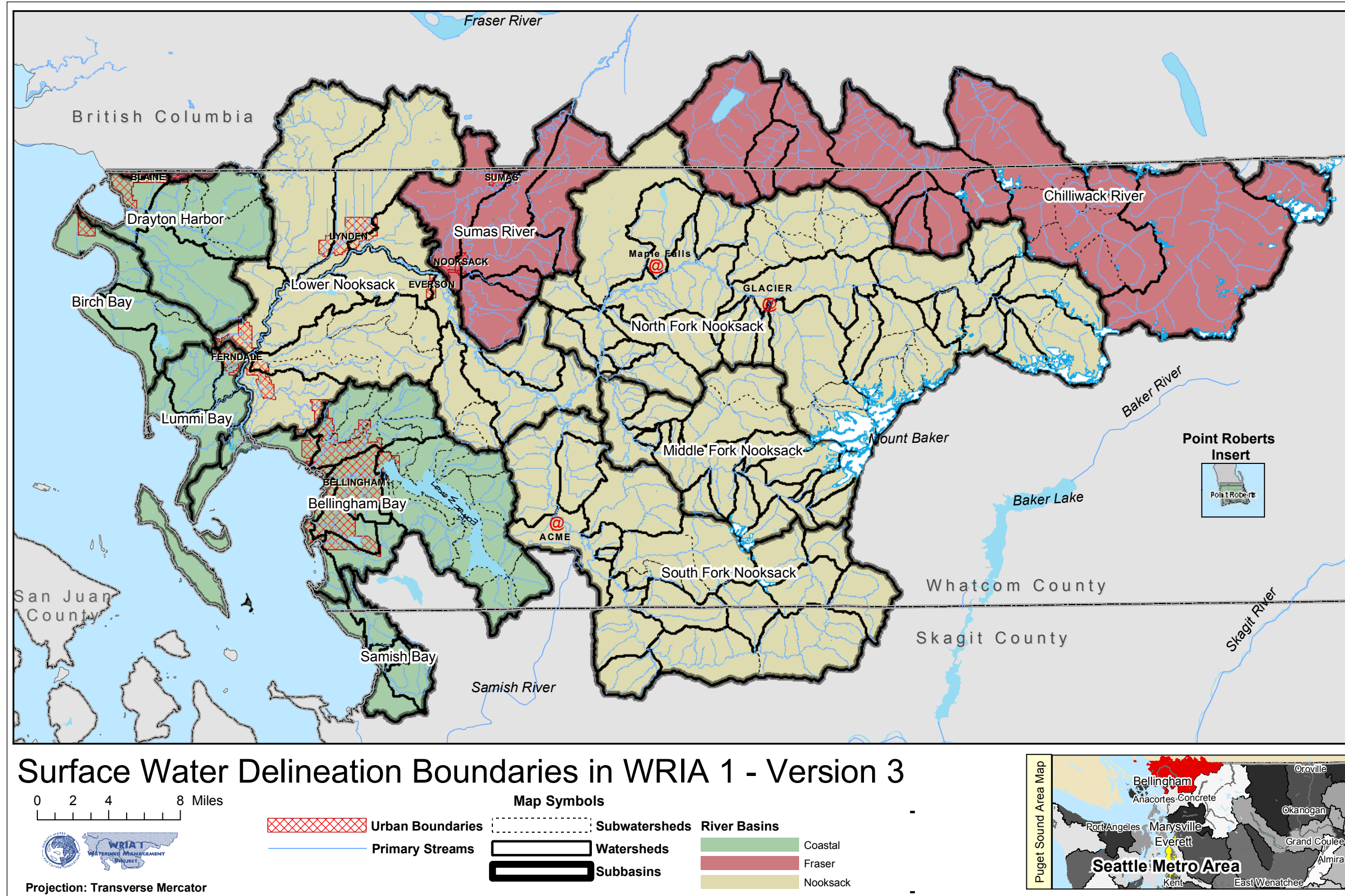


Figure 2.2: Surface water delineation boundaries used by the WRIA 1 Watershed Management Project.

Puget Sound (Drayton Harbor, Birch Bay, Lummi Bay, Bellingham Bay, and Samish Bay).

- Subbasin – This is the second in order of surface water delineation in the WRIA 1 hierarchy, meaning it is nested within a basin. Examples of subbasins in WRIA 1 include the North Fork Nooksack Subbasin of the Nooksack River Basin or the Sumas Subbasin of the Fraser River Basin.
- Watershed - This is the third in order of surface water delineation in the WRIA 1 hierarchy, meaning it is nested within a subbasin and a basin. Examples of watersheds include Dakota Creek, Lake Whatcom, Glacier Creek, and Bertrand Creek.
- Subwatershed – This is the fourth in order of surface water delineation in the WRIA 1 hierarchy, meaning it is nested within a watershed, a subbasin, and a basin. Examples of subwatersheds include Upper Wells Creek, North Fork Anderson Creek, Haynie, and Blue Canyon.
- Drainage – This is the fifth in order of surface water delineation in the WRIA 1 hierarchy, meaning it is nested within a subwatershed, a watershed, a subbasin and a basin. Although the size of a drainage varies widely, this is typically the smallest surface water delineation in the WRIA 1 terminology. There are 177 drainages in WRIA 1. The drainage is the geographic scale of the hydrologic computer models being developed by USU.

Next Steps

As more precise elevation data, stream and ditch locations, and field information becomes available, the WRIA 1 map should be updated to reflect the best information available. In addition, modifications may be necessary to meet the needs of WRIA 1 Project participants. A process will need to be defined that allows updates to the map to occur. It is anticipated that this process will occur as part of the long-term implementation strategy as discussed in Section 4.2.3 (Governance Structure and Implementation Strategy).

2.3.1.2 Land Cover

Background

One of the requirements specified in the WRIA 1 March 2000 Scope of Work is to “evaluate existing land use/land cover data for its suitability in making water resource related decisions”. Although this requirement is covered under the water quantity element of the March 2000 scope, it is being discussed in this section of the Watershed Management Plan because the land cover information has application to all of the technical elements of the WRIA 1 Project (water quantity, water quality, instream flow, fish habitat).

Land cover data provides information on the vegetative and non-vegetative ground cover of the land surface. Accurate land cover mapping is essential to support the technical assessment work and computer models being developed for use in the decision support system. (Note: These models will be discussed in subsequent sections.) A computer model needs data appropriate to and accurate for the time period being modeled, a grid size that matches the model resolution, and a land cover classification approach with adequate detail to influence model results.

Methods/Results

The USGS National Land Cover Data (NLCD) was initially chosen as the land cover dataset for the WRIA 1 technical work. However, when USU technicians conducted further review of the dataset for a specific site (Ten Mile and Hillsdale area), the review showed limitations and ultimately resulted in WRIA 1 participants and the USU scientists taking additional steps to enhance the land cover database.

A meeting was held between WRIA 1 Technical Team Leads, Technical Team members, USU technicians and lead scientist, and other interested WRIA 1 participants to evaluate available land cover maps and datasets. Based on the outcomes of the classes from ortho imagery for the 20 high growth areas was merged⁴. A mosaic of these data

⁴ The datasets used were: existing NLCD from 1992, maps from the Interagency Vegetation Mapping Project, Whatcom County 2001 orthophotos, farm plan fields (DAIRY), and Canadian Baseline Thematic Mapping

was created to form the WRIA 1 existing conditions land cover map. To verify the meeting, the most accurate data from three existing land cover maps and interpreted quality of the new dataset, a ground-truthing element was incorporated into the approach, which the PUD No. 1 contractors performed.

The methods and outcome of the ground-truthing work are reported in the document *WRIA 1 Land Cover Accuracy Assessment*. The approach to creating a more accurate land cover dataset are described in Utah State University, *Land Cover Action Plan*, by Connely Baldwin and Mark Winkelaar, December 5, 2002. A final report describing the methodology and documentation for delineation of existing conditions, historical conditions, and full build-out conditions will be submitted by USU to WRIA 1 participants as part of the final project deliverables. Figure 2.4 provides an illustration of the existing conditions land cover map that will be used in the WRIA 1 Project.

The Phase III Scope of Work includes USU preparing three scenarios to demonstrate the capability of the DSS: historic conditions, existing conditions, and projected full build out conditions. In preparing for these simulations, USU will need to prepare land cover datasets for each scenario. The land cover data set for the existing conditions scenario is the dataset previously discussed. For the historical and full build out conditions, USU is preparing two modified versions of the existing land cover dataset. The work on these datasets has been initiated through a series of technical memos and conference calls between WRIA 1 Staff Team and Technical Teams and USU. As part of the interactive process, the WRIA 1 Technical Teams provided feedback and data sources where needed to assist USU in their effort.

USU has submitted preliminary reports to WRIA 1 Staff Team and Technical Teams describing the mapping methodology and data sources for both the historic and full build out land cover. The preliminary reports for these two scenarios are in different stages of completion. The historic conditions report has been reviewed by the WRIA 1 Technical

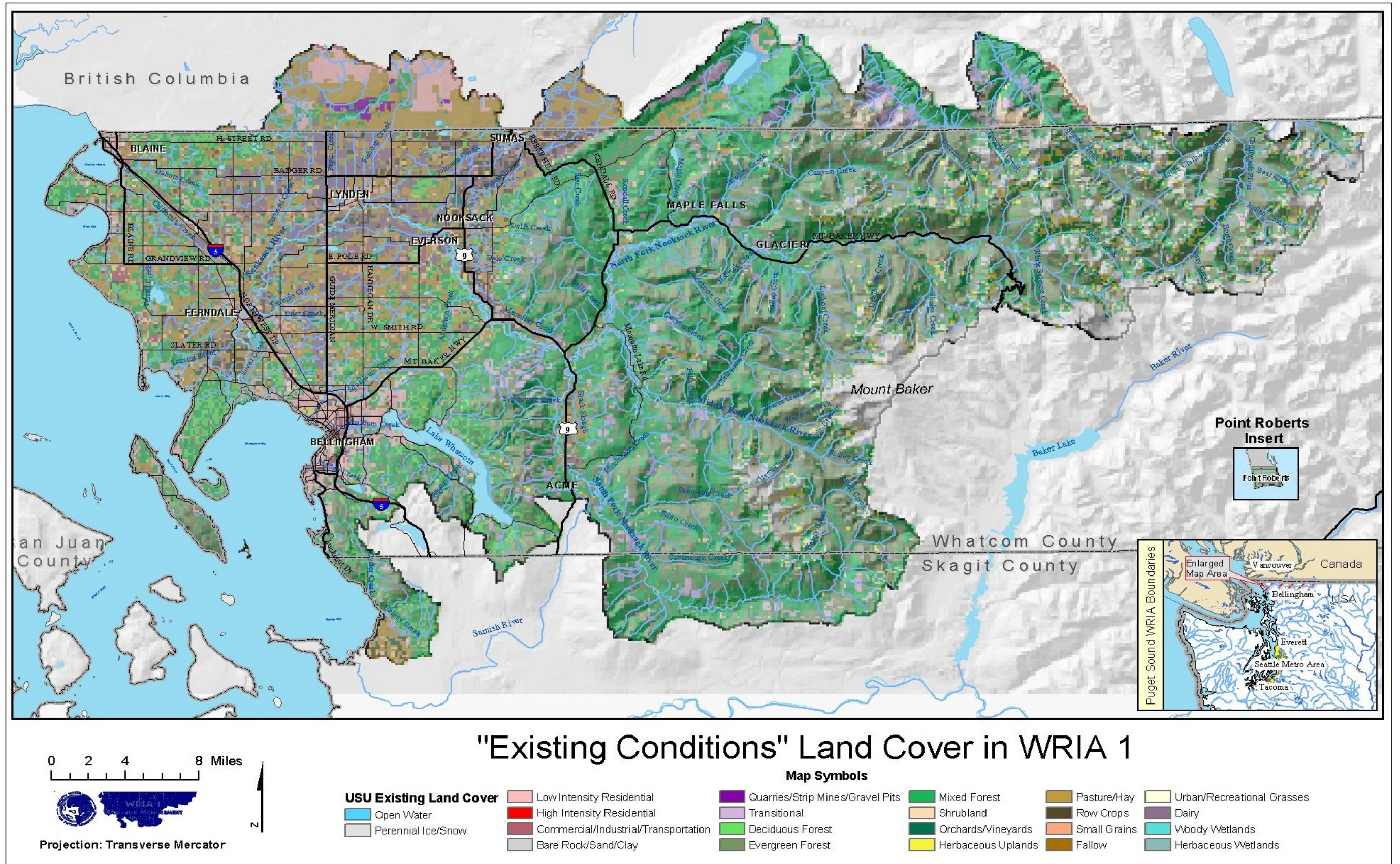


Figure 2.4: Map of existing land cover for WRIA 1

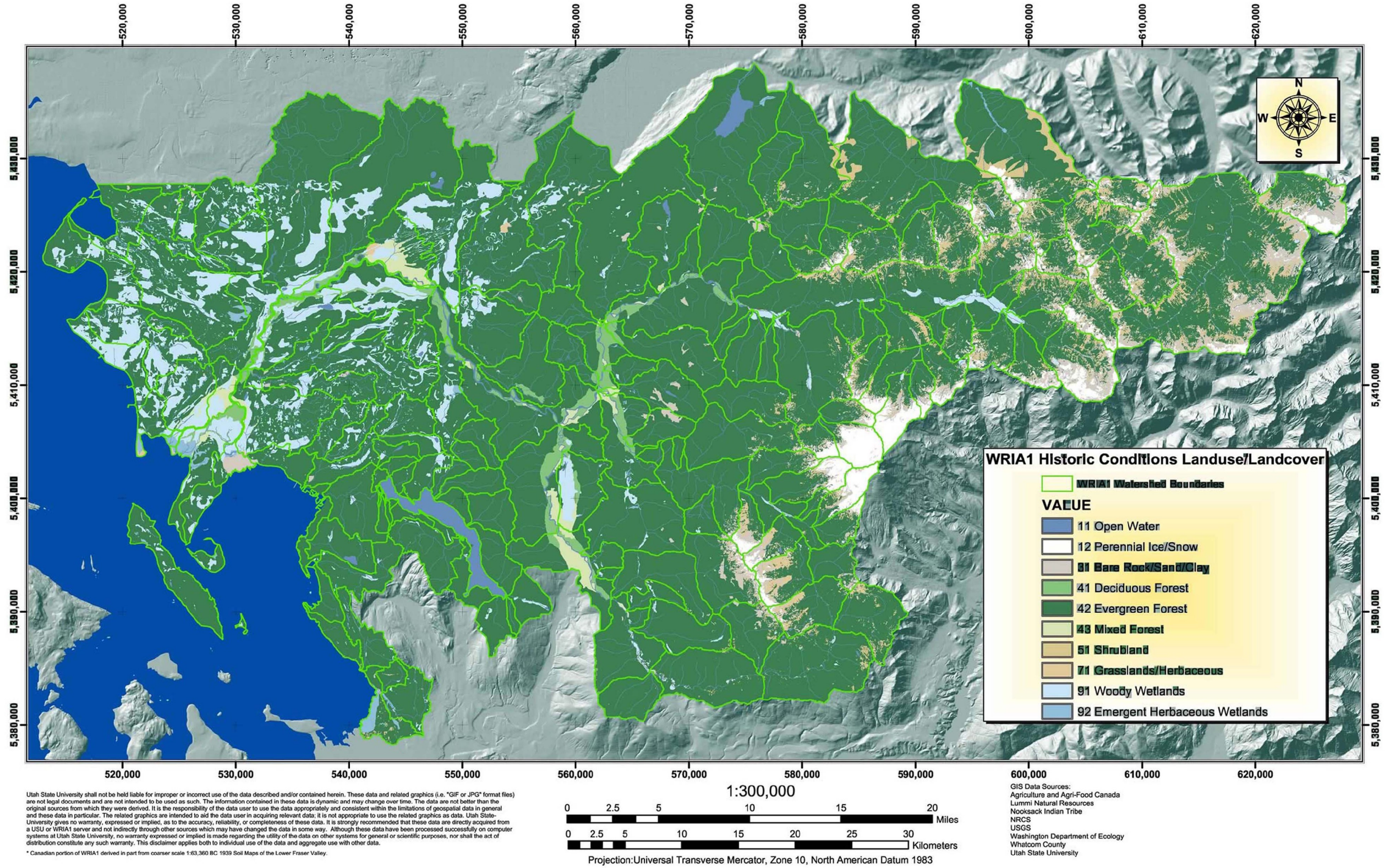


Figure 2.5: Historic land cover interpretation by USU for WRIA 1

Teams and with minor corrections to be made by USU, is acceptable for use in running the DSS simulation for the historic conditions scenario. Figure 2.5 is the historic land cover map included in the historic conditions mapping methodology preliminary report. While the full build out land cover preliminary report has also been reviewed in the same manner as the historic conditions report, the schedule for completing it was extended in order to provide USU with the most recent datasets available. As a result, a final map representing conditions expressed in the preliminary full build out report was not available in time to include in this version of the WMP.

As with the existing land cover data set and report discussed earlier, the final reports for the historic and full build out conditions mapping methodology will be provided to WRIA 1 as final project deliverables in 2005.

Next Steps

The land cover map will need to be updated periodically. Updates will be considered as part of future WRIA 1 WMP implementation work plans.

2.3.1.3 Water Quantity

Background/Purpose

The overarching Water Quantity goal stated in the WRIA 1 March 2000 Scope of Work is:

To assess water supply and use, and to develop strategies to meet current and future needs. The strategies should retain or provide adequate amounts of water to protect and restore fish habitat, provide water for future out-of-stream uses, and to ensure that adequate water supplies are available for agriculture, energy production, and population and economic growth under the requirements of the state's Growth Management Act (GMA).

To meet this goal, technical assessments were conducted to assist WRIA 1 participants to understand the nature and extent of water quantity issues and to develop technical tools to help address the issues identified. The March 2000 Scope of Work

identified the following specific technical assessment requirements, many of which are required by Chapter 90.82 RCW:

- Estimate the amount of surface and ground water present;
- Estimate the total amount of water available in an undepleted condition;
- Estimate the amount of surface and ground water actually being used in the WRIA;
- Conduct a depletion analysis to accurately estimate the spatial and temporal uses of water in the WRIA throughout the year;
- Estimate future water needs;
- Estimate the amount of water represented by claims in the Washington State water rights claims registry, water use permits, certificated rights, existing minimum instream flow rules, federally reserved rights, and any other rights to water;
- Use the best available science to make reliable estimates of the Lummi Nation water rights for both instream and out of stream uses;
- Identify the most senior instream and out of stream water rights in the WRIA and the next most senior rights in turn based on the priority date of existing water right holders;
- Estimate the amount of surface and ground water available to junior users and for further appropriation taking into account seasonal and other variations and the minimum instream flows adopted by rule or to be adopted by rule under the RCW for streams in the management area including the data necessary to evaluate necessary flows for fish.
- Identify location of areas where aquifers are known to recharge surface bodies of water and areas known to provide for the recharge of aquifers from the surface;

- Contract with USGS to collect streamflow data throughout the watershed for the multi-year [10 year] effort;
- Measure and/or estimate climate data (precipitation, evapotranspiration) at representative locations in the WRIA;
- Evaluate existing land use/land cover data for its suitability in making water resource related decisions.

These requirements were used along with local perspectives to identify the approach and actions to be implemented for the water quantity technical assessment work.

Methods/Results

The overall approach used to evaluate how much water is present and ultimately available for current and future use required assessing two fundamental types of

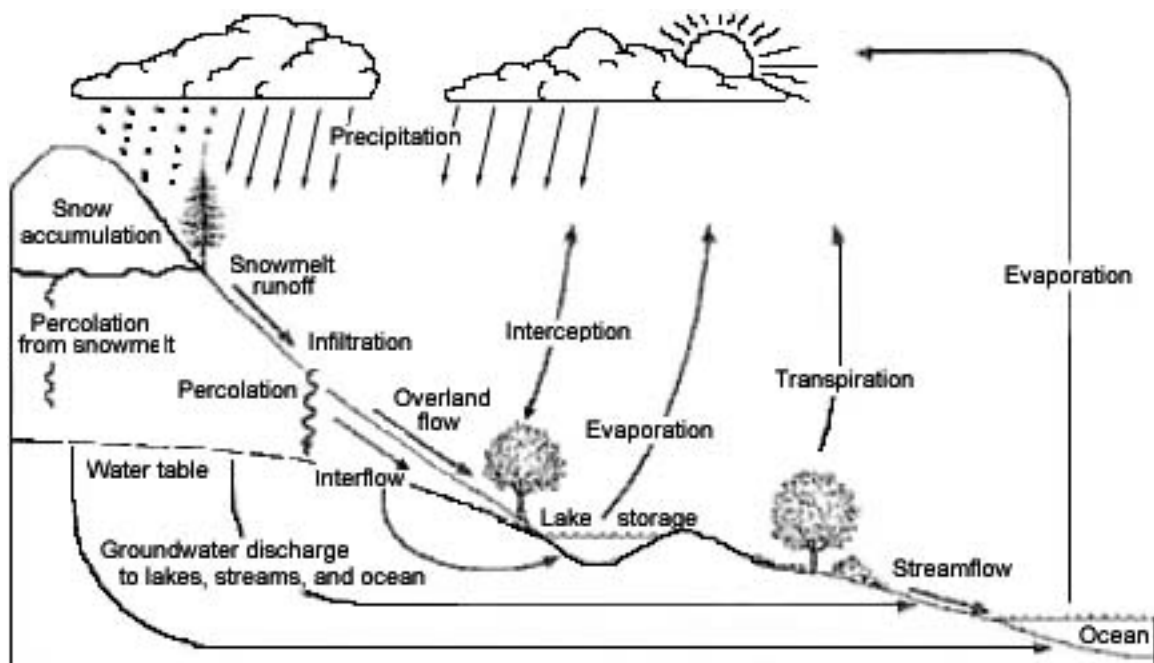


Figure 2.6: Water balance diagram

information:

- 1) The physical factors influencing when, where, and how much water can be found in WRIA 1; and
- 2) The legal constraints and considerations that identify how much water has been legally obligated, to whom, and when, including unresolved water rights.

The physical factors include the amount of precipitation and when and where it occurs, the amount of water used and/or committed, the type of land cover, streamflow, ground water recharge, and the connection between ground water and streamflow (hydraulic continuity). These factors are components of a water balance and are illustrated in Figure 2.6. A water balance and associated computer models are being constructed as part of the technical assessment work for water quantity.

The specific type of information needed to develop a water balance include:

- *Precipitation*
- *Surface water runoff*
- *Surface water infiltration-ground water recharge*
- *Baseflow estimation*
- *Evaporation and transpiration*
- *Surface and ground water withdrawals*
- *Water storage in foliage, snowpack, glaciers, and soil*

Since is it not possible or practical to measure all the water budget components at all locations, estimates must be generated and refined over time. Statistical analysis, extrapolation, and numerical modeling are ways to estimate variables that are not measured all the time or at all desired locations.

Inherent to use of a water balance is the recognition that the amount of water present and available is not a static number but changes over time and space as those factors previously noted (e.g., precipitation, use) change. The models being developed will enable these changing factors to be considered and will enable different management actions to be evaluated for their effectiveness.

Such management actions include:

- Changes in the amount of water used including changes in the location and timing of water use (e.g., changing the rate of water use including adjusting irrigation efficiency and other conservation measures);
- Changes in land use and cover;
- Changes in climatic factors such as precipitation, wind, and temperature;

Water is a public resource and legal requirements must be followed in order to use it. Generally, this means obtaining a water right. A water right is the legal authorization to use a specific amount of public water from a specific source for a specific beneficial use in a specific location.

- Evaluating possible storage options; and
- Evaluating transfer of water between drainages.

Legal constraints and considerations fall under water rights/water law. Among other things, these laws determine who can use water, how much, when, where, and for what purpose. Water is a public resource and a “water right” is the right to use the water that actually belongs to the public. Water rights can be divided into two general types: 1) State water rights, which are needed by state agencies and private property owners in order to use water, and 2) Federal reserved water rights, which are created outside of the framework of state water law. State and Federal reserved water rights are discussed in greater detail in the upcoming section on Water Rights/Water Law (pg. 52).

Information in both these areas (physical and legal) is essential to understanding how much water is present and what may be available to meet existing and future needs in WRIA 1. The USGS and USU were the entities that conducted the majority of the work associated with understanding the physical factors for the WRIA 1 Project. PUD No. 1 contract staff and WRIA 1 Project participants have conducted most of the work associated with the water rights/water law information. In the following discussion, the USGS and USU work is discussed first followed by an overview of work associated with water rights/water law.

United States Geological Survey

The USGS was commissioned in the summer of 1999 to conduct the initial work on water quantity. Their work focused on two activities: 1) compiling existing information on water use, streamflow, and climate for use in constructing a hydrologic model; and 2) updating a previously established compilation of existing studies related to water resources in WRIA 1. The previous compilation was completed in 1996 by the Nooksack Water Users Steering Committee (Catalogue of Existing Information on Water Resources and Fisheries in the Nooksack Basin). The USGS added 115 new entries to the existing 463 references of existing data and reports. Whatcom County Water Resources Division is currently maintaining the catalogue, which is located in the Division library. The

results of the USGS work are provided in a report titled *Summary of Part 1 of WRIA 1 Water Resource Assessment – Compilation of Data* (January 31, 2000), and on the web at <http://wa.water.usgs.gov/projects/wria01/>. The USGS also produced a guide titled *Web Guide to USGS Hydrologic Data* to assist users accessing information on their website *Utah State University*

USU has been the primary contractor responsible for the collection of data and the development of surface and ground water computer models. The models are a component of the DSS and will be used to simulate variables of the water budget and show relative differences in water available under different management options that may be considered.

As previously described, USU's technical assessment work has taken place in phases. USU used Phase I to define the overall scope of the WRIA 1 Project, which they then implemented and refined in Phases II and III.

The following is an overview of the technical assessment work conducted by USU. The assessment work associated with surface water quantity will be discussed first, followed by ground water quantity.

Surface Water Quantity

Phase II work for surface water quantity focused on four activities (Hardy et al., 2002; Utah Water Research Laboratory, 2000):

1. Assessing the ability of the available streamflow and climatological database to support analysis and modeling efforts needed for evaluating management options;
2. Obtaining/creating appropriate gage records/runoff estimates for use in streamflow modeling;
3. Developing a preliminary water balance of surface water flows, including providing an initial estimate of the quantity of water that is present, available, and actually in use in WRIA 1; and

4. Evaluating available surface water quantity models, including providing a recommended modeling approach and associated data collection needs.

*Streamflow and Climatological Data*⁵

During the USU Phase II technical assessment work, the data from 17 active and 36 discontinued streamflow gages (Figure 2.7) were assembled and statistically analyzed (Hardy et al., 2002). In general, USU noted that the streamflow records for WRIA 1 were deficient in terms of the length of record. A record duration of at least 20 years is recommended to obtain a reasonable estimate of average flows, with additional time needed to estimate the variance in streamflow. Only nine gages in WRIA 1 have 20 years or more of data and of these, only five are currently active. The active gages are the North Fork of the Nooksack below Cascade Creek, the Middle Fork near Deming, the South Fork near Wickersham, the Nooksack River at Deming, and the Nooksack River at Ferndale.

In 1998, six gages were either established or continued under a collaborative program between the US Bureau of Indian Affairs, USGS, Lummi Nation, and Nooksack Tribe. In 2003, another 14 gages were established under a joint program of the Washington State Department of Ecology and Nooksack Tribe. Although the data from these recent programs will benefit current and future efforts, relative to the technical assessment work underway USU states, “this will not compensate for the lack of historical stream flow data and the attendant impact on uncertainty in analyses requiring spatial information on stream flow over time.”(Baldwin, Tarboton, Shoemaker, McKee, and Basdekas, 2002, p. 5)

Also included in the USU Phase II technical work was an assessment of climatological data including precipitation, temperature, snow pack, wind, solar radiation,

⁵ *Assessment of Streamflow and Climatological Data Available for Use in WRIA 1 Watershed Management and Estimation of Long-Term Mean Monthly Runoff for Water Balance Calculations* provide additional information on streamflow and climate components of the WRIA 1 project (Baldwin, et al., 2002; Baldwin, et al., 2001).

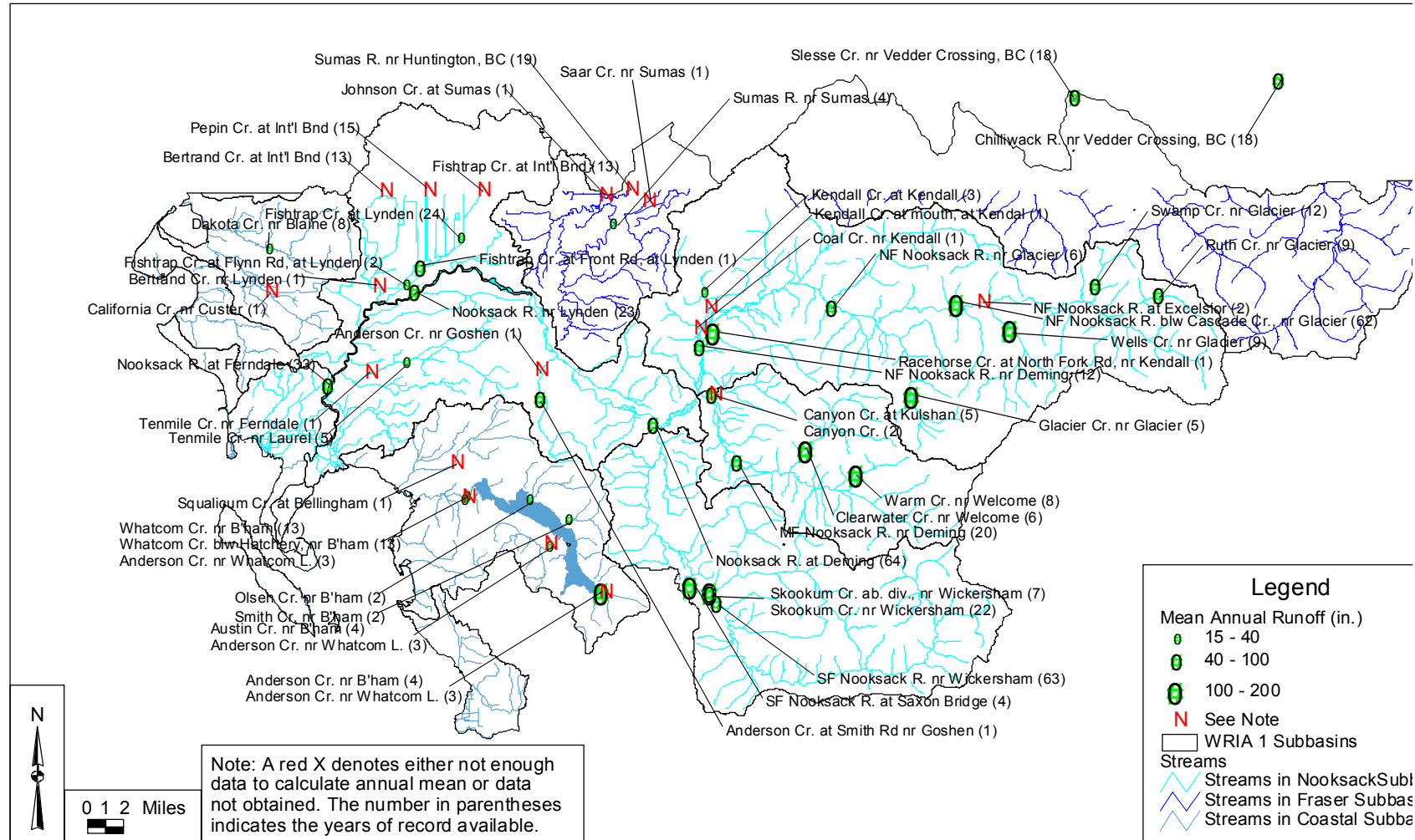


Figure 2.7: WRIA 1 stream gages for Phase II Assessments (Hardy et al., 2002)

dew point, and relative humidity. Forty-five (45) stations were identified in and around WRIA 1 that collect information on some or all of these data. Precipitation information is provided in Figures 2.8 through 2.9. Figure 2.8 provides information on precipitation including the location, years of record, and average annual precipitation.

Figure 2.9 provides estimates of mean annual precipitation using PRISM (Parameter-elevation Regressions on Independent Slopes Model) estimates (Baldwin et al., 2002). The PRISM results are used to estimate precipitation for areas without climate stations. The USU evaluation of PRISM data indicates that the estimates are good in the lowlands but significantly underestimate precipitation in the highlands. To correct this deficiency USU recommended installing precipitation (SnoTel) and evaporation gages in those areas and, using these gages, develop a better way to estimate the spatial variability of precipitation (Baldwin, Tarboton, Basdekas, and McKee, 2001, Task 3 p.32).

USU Phase II work also included examining evapotranspiration information. For this work, USU used the Hargreaves method⁶ to estimate monthly evapotranspiration. Actual evapotranspiration was calculated by multiplying this reference evapotranspiration by a crop or vegetation coefficient, based upon land cover. Figure 2.10 provides annual evapotranspiration estimates along with the locations of the pan evaporation gages used to validate the estimates. Figure 2.10 illustrates that estimates of evapotranspiration are higher in the lowlands than in the highlands. The highest estimates of evapotranspiration occur in areas with significant agricultural land use. There are very limited data available to assess the uncertainty of this estimate (Baldwin et al., Task 3, 2001 p. 24). USU found that in general, “data available to estimate evapotranspiration using the most scientifically based methods are very limited. There are no solar radiation stations with historic data in WRIA 1 at this time (Baldwin et al., 2002 p. 22).” It is worth restating that technical studies and data collection in WRIA 1 is ongoing and information from the USU Phase II technical assessments may require modification based on the outcomes of the data and/or Phase III technical work.

⁶ As part of the USU Phase III technical work, the more reliable Penman-Monteith method is being applied.

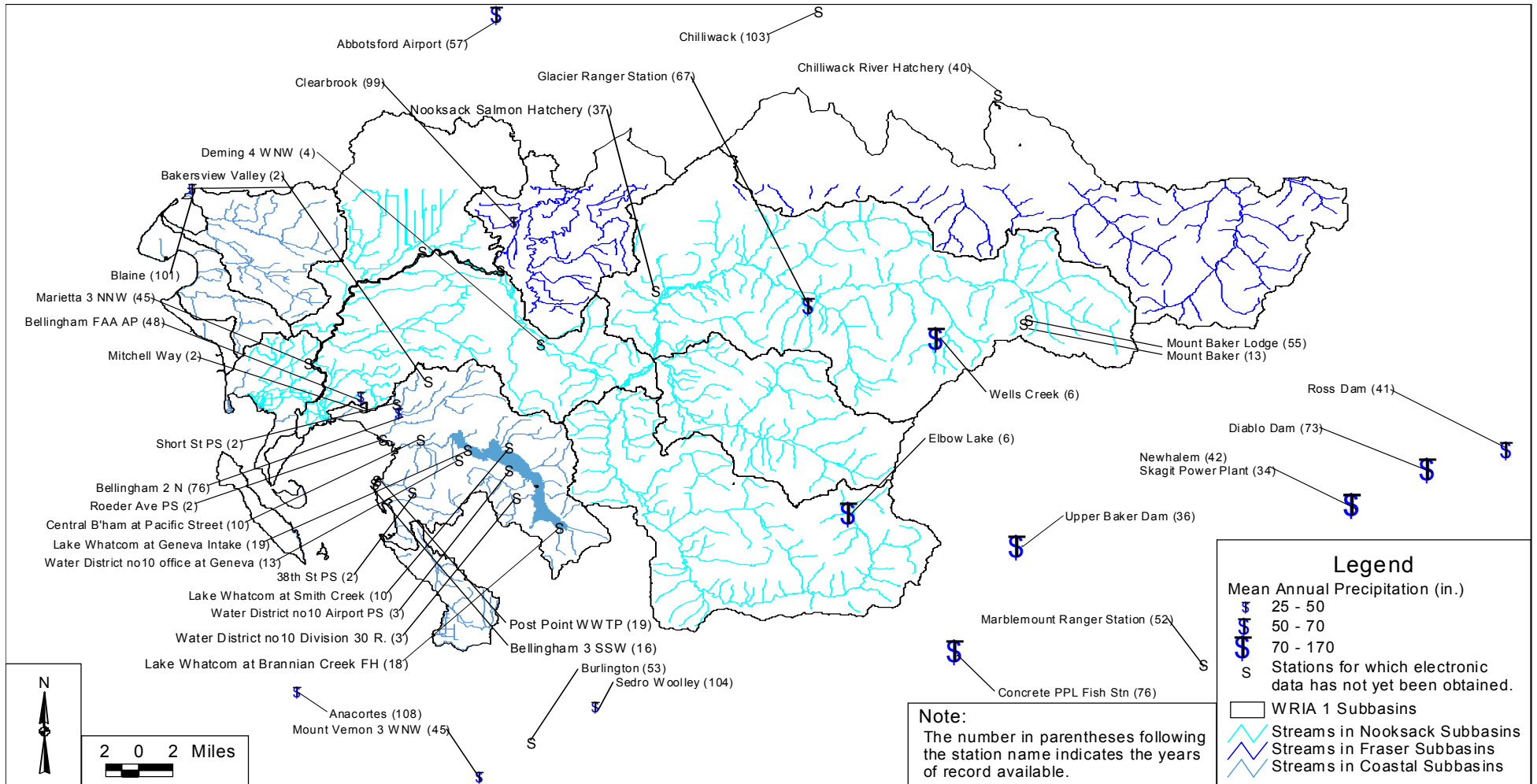


Figure 2.8: Average annual precipitation (Baldwin et al., 2002)

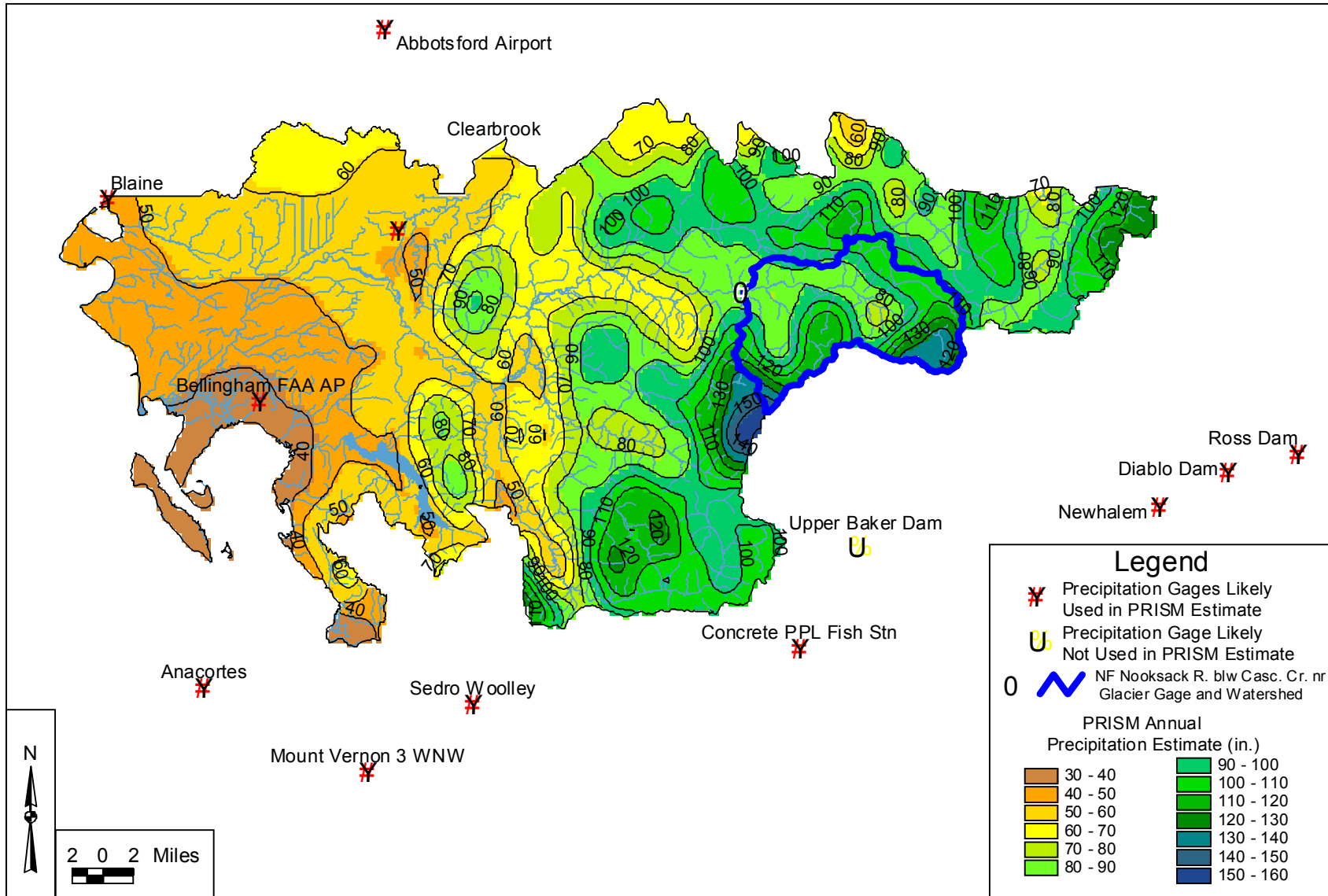


Figure 2.9: Mean annual precipitation using PRISM (Baldwin et al., Task 3, 2001)

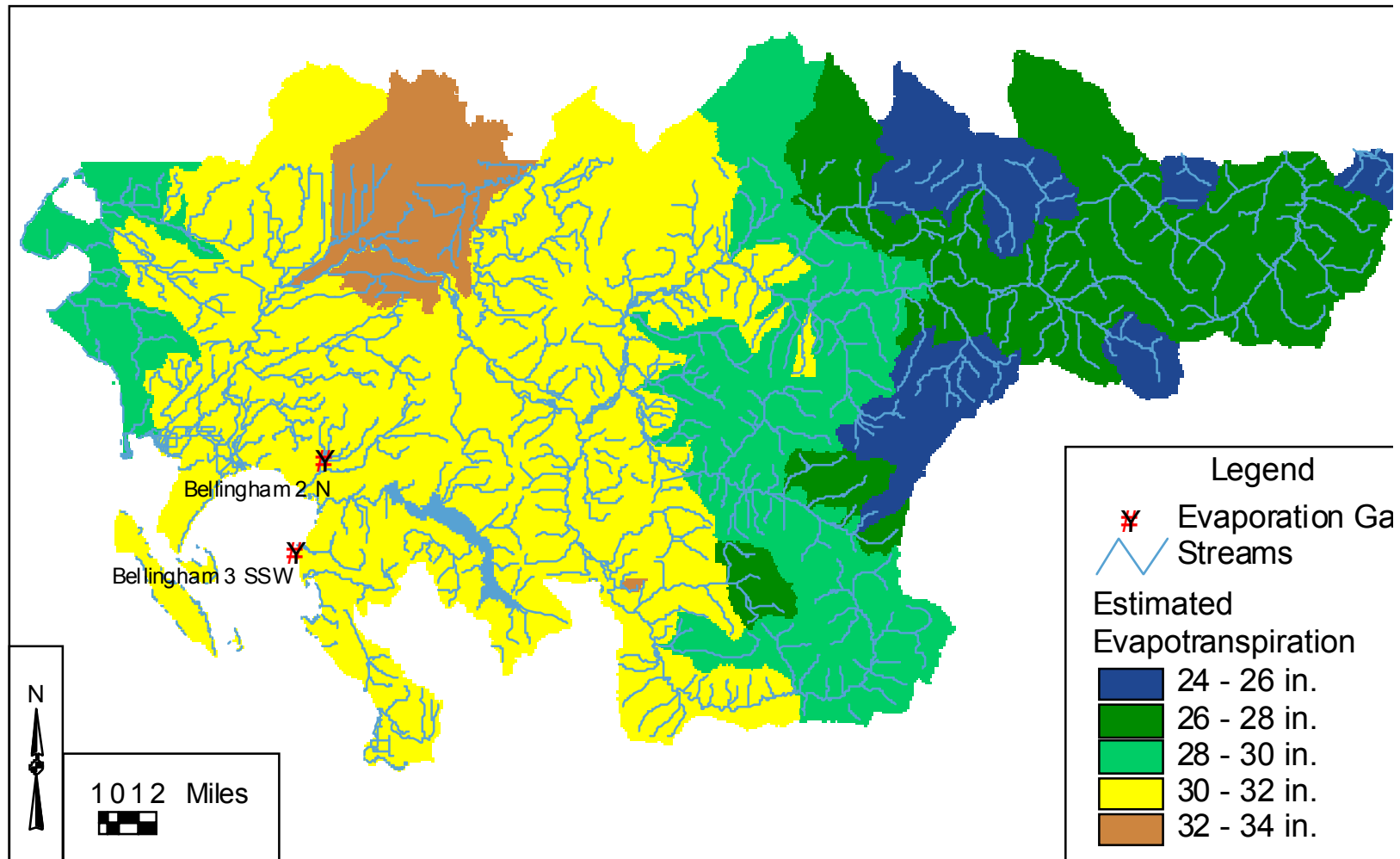


Figure 2.10: Annual evapotranspiration estimates (Baldwin et al., 2001)

In the fall of 2001, Washington State University installed two Public Agricultural Weather System (PAWS) stations in the lowlands near Lynden and Nooksack. The PAWS stations measure variables needed to calculate reference evapotranspiration and other climate parameters. This PAWS data (available at <http://index.prosser.wsu.edu>) will be useful in developing/refining future evapotranspiration estimates for the lowlands. There are two stations that have recorded pan evaporation data: Bellingham 2N and Bellingham 3SSW. As part of Phase III, for purposes of the WRIA 1 surface water quantity modeling, USU will use the Penman-Monteith method to calculate reference evapotranspiration.

Preliminary information on streamflow and climatological data is provided in "Assessment of Stream Flow and Climatological Data Available for Use in WRIA 1 Watershed Management." Preliminary information on evapotranspiration is provided in "Estimation of Surface Water Components of the WRIA 1 Water Balance".

Run-off Estimation

USU estimated the long-term mean monthly streamflow for 176 of the 177 drainages in WRIA 1 where digital elevation model (DEM) data were available. They performed a statistical analysis of the available streamflow data, naturalized to reflect the effects of estimated surface diversions, to develop these estimates. This analysis was done using a local regression methodology, termed LOESS, which USU felt was well suited for use in WRIA 1. The LOESS method also provides a quantification of the uncertainty contained in the streamflow estimates. Forty-five (45) different sets of model parameters were analyzed to obtain the best possible regression. The resulting preliminarily estimated mean annual runoff is shown in Figure 2.11. (Hardy et al., 2002).

Uncertainty estimates associated with the runoff estimates are provided in Figure 2.12. Drainages shown as hatched or red have the greatest uncertainty, yellow is moderate, and green has the lowest uncertainty. For purposes of determining locations for additional gages, USU recommends this information be considered along with other information such as locations where additional water needs are expected or where problems are currently being experienced. Additional details on the Phase II methods

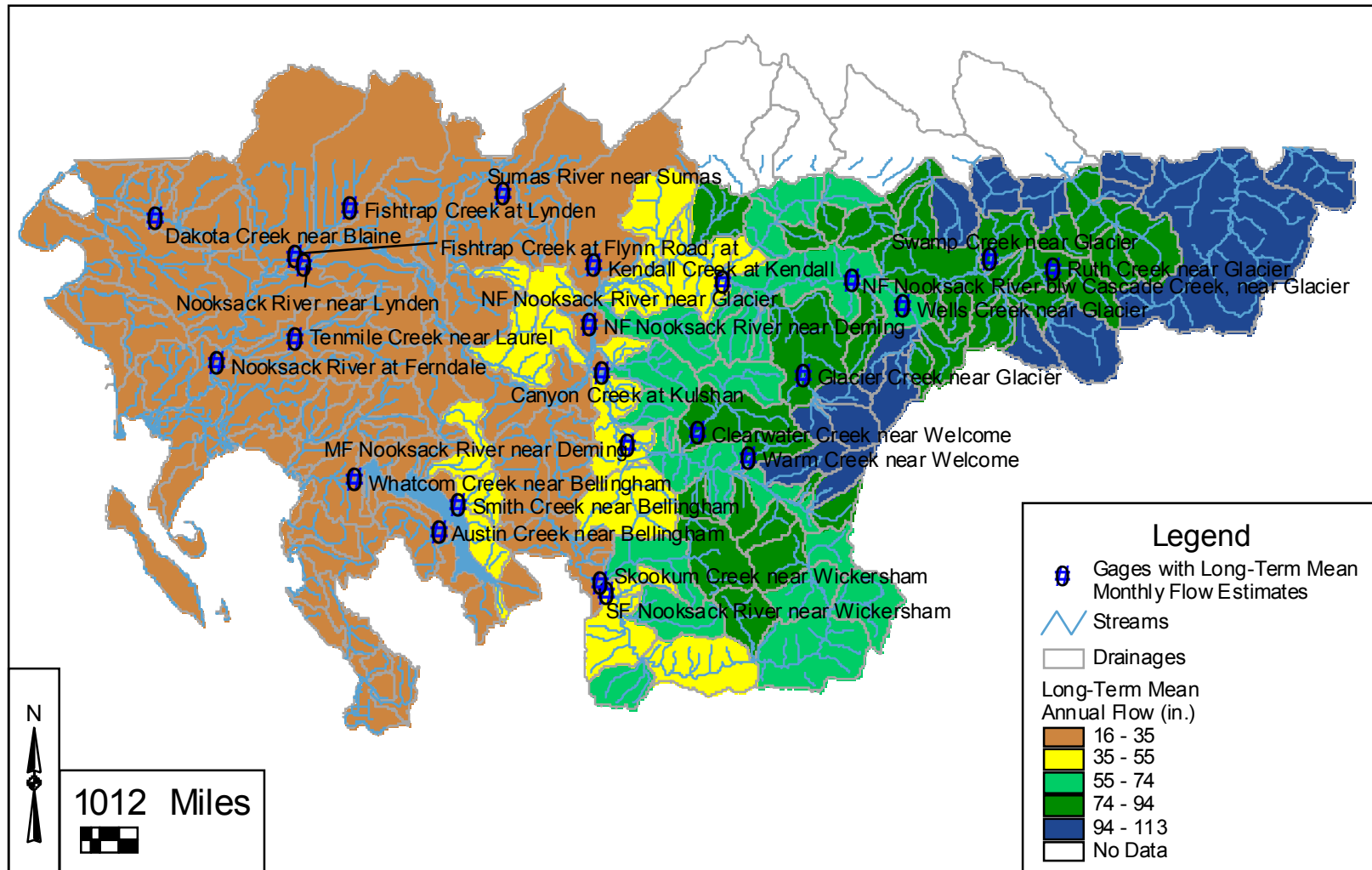


Figure 2.11: Estimated naturalized average annual runoff from WRIA 1 drainages (Hardy et al., 2002)

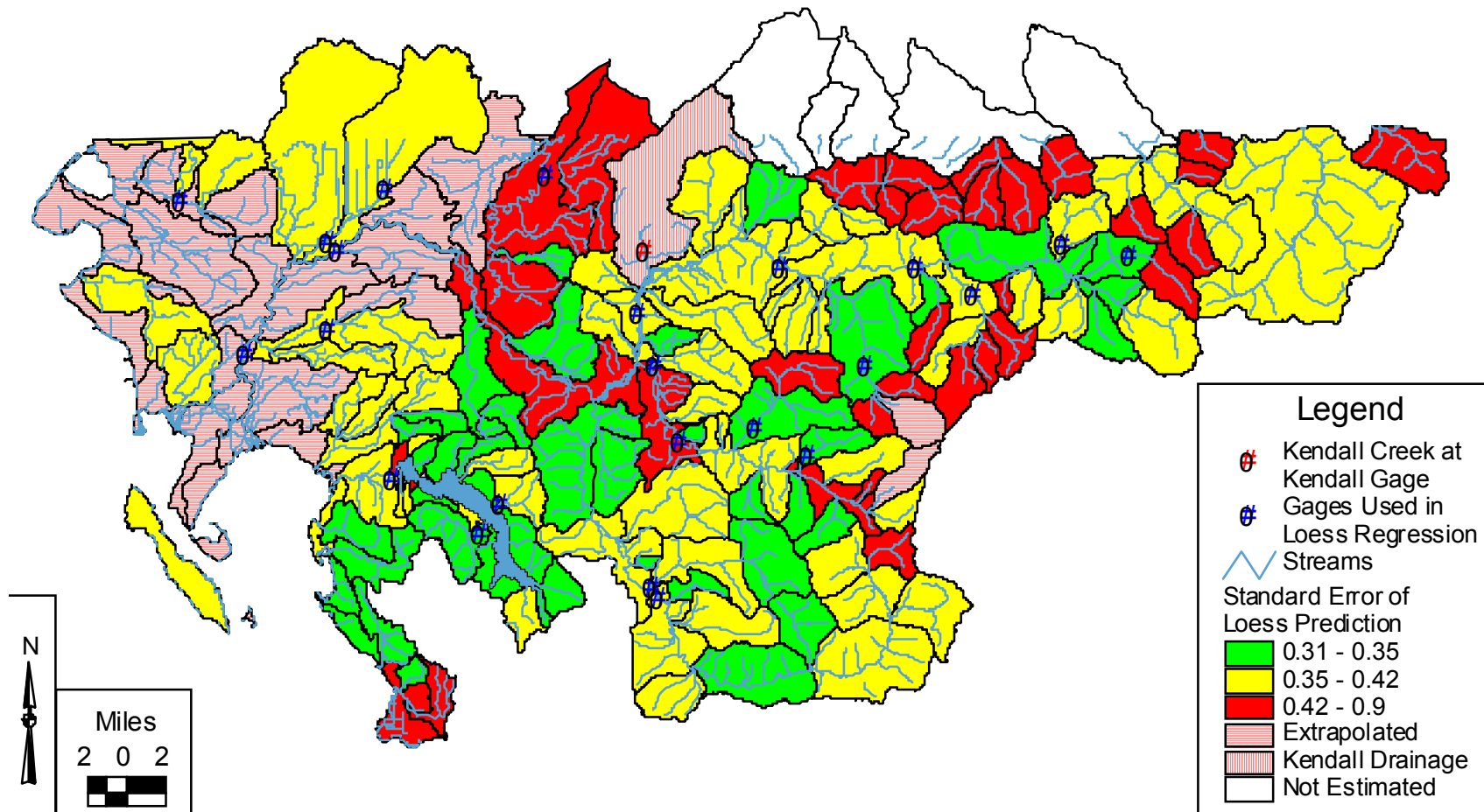


Figure 2.12: Uncertainty estimates associated with runoff estimates (Hardy et al., 2002)

and preliminary results are provided in *Estimation of Long-Term Mean Monthly Runoff for Water Balance Calculations* (Baldwin, Tarboton, and McKee., Task 2, 2001).

Preliminary Water Balance

The purpose of the preliminary water balance work was to quantify the surface water balance and water use in WRIA 1 at the drainage scale (Baldwin et al., Task 3, 2001). As part of the water balance work, USU provides definitions and preliminary estimates for surface water *present*, *available*, and *actually in use*. The amount of surface water runoff *present* is the naturalized⁷ surface water runoff quantified in the previously described USU Phase II surface water quantity report. The amount of water *actually in use* is defined as surface water diverted from its natural course⁸. The amount of surface water runoff available is the amount of surface water runoff *present* less the water *actually in use*.

Information about precipitation, evapotranspiration, streamflow, and water use was used to prepare *preliminary* water balances for the WRIA 1 drainages. The results are provided in *Estimation of Surface Water Components of the WRIA 1 Water Balance*. (Baldwin et al., Task 3, 2001) The report also describes the method for obtaining the water use estimates. Following is a summary of this work.

PUD No. 1 contract staff, under the guidance of USU, developed the current water use estimates used for the preliminary water budgets. Two categories of estimated current water use were created. One category – public water system (PWS) use- was based on data from public water systems that meter water use. The other category – non-PWS use- was based on use estimates where metered data were not readily available.⁹

⁷ To estimate naturalized flow at the gaged watershed, USU estimated the volume of the diversion and net consumptive use and added them to the measured streamflow (Baldwin et al., Task 2, 2001, pg 4)

⁸ Water use as discussed here refers to consumptive (e.g., domestic, commercial, municipal, industrial, and agricultural) uses and does not include instream water needs such as those required by fish, wildlife, recreation, etc.

⁹ Use of the terms PWS and non-PWS are not intended to imply that the water either comes from, or does not come from, a public water system. The distinction is based solely on whether metered data were available. Although the terms are misleading they have been retained in this discussion to maintain consistency with the terminology used by PUD staff and USU investigators.

The category PWS includes all of the cities in the WRIA and many of the other larger water systems including PUD No. 1. In addition, some major irrigators are included in this category. Within many of these systems, water is used for residential, commercial, municipal, industrial, and in some cases, agricultural uses. A breakdown of these uses within the category was not undertaken.

The category non-PWS includes estimates of the remaining water uses within WRIA 1. Since it is non-metered use, an alternative approach to estimate water use was developed. The methodology developed relied upon Whatcom County Assessor tax parcel land use codes. The codes were mapped into water use types, and assumptions were developed about unit rates of water use for each use. Additional details on the methodology are provided in the Phase II report titled *Estimation of Surface Water Components of the WRIA 1 Water Balance* (Baldwin et al., Task 3, 2001). Through this methodology, the non-PWS category was further broken out into agriculture, residential, commercial, and industrial use. It is again important to note that the PWS category also provides water for these uses but they were not broken into these further categories. As a result, while it is possible to estimate total water use for surface and ground water throughout the year, it is not possible to estimate total commercial/industrial, agricultural, and residential water use.

This joint effort of the PUD No. 1 staff and USU resulted in water use estimates for 128 of the 177 drainages in WRIA 1 for which tax parcel information was available. The estimates included both surface water and ground water sources (Hardy et al., 2002).

Estimated total annual water use for the categories PWS and Non-PWS, is 66,000 acre-feet and 62,000 acre-feet respectively for a combined total of 128,000 acre-feet each year. Figure 2.13 illustrates how this annual volume is distributed monthly. Surface water is the source of most (95%) of the PWS use, with ground water providing most (~75%) of estimated non-PWS use.

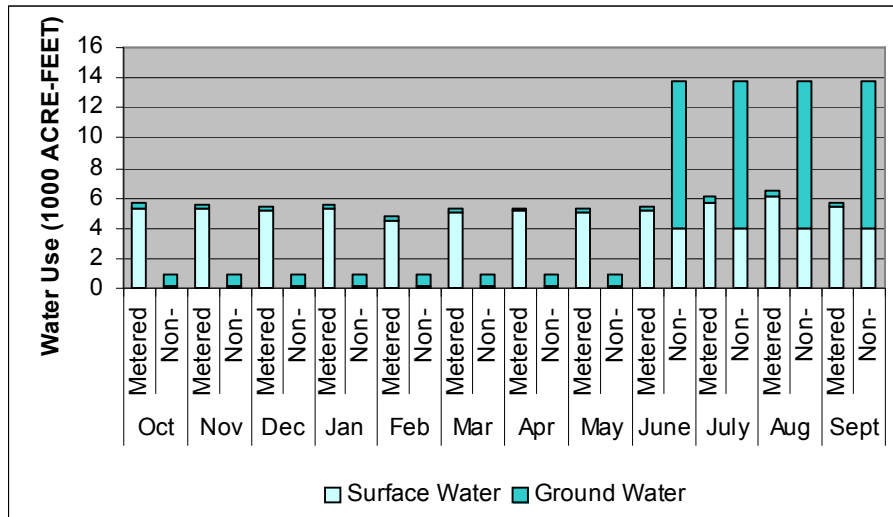


Figure 2.13: Monthly water use for metered (termed PWS) and non-metered (termed non-PWS) categories. (Figure generated by WRIA 1 staff based on USU use estimates.)

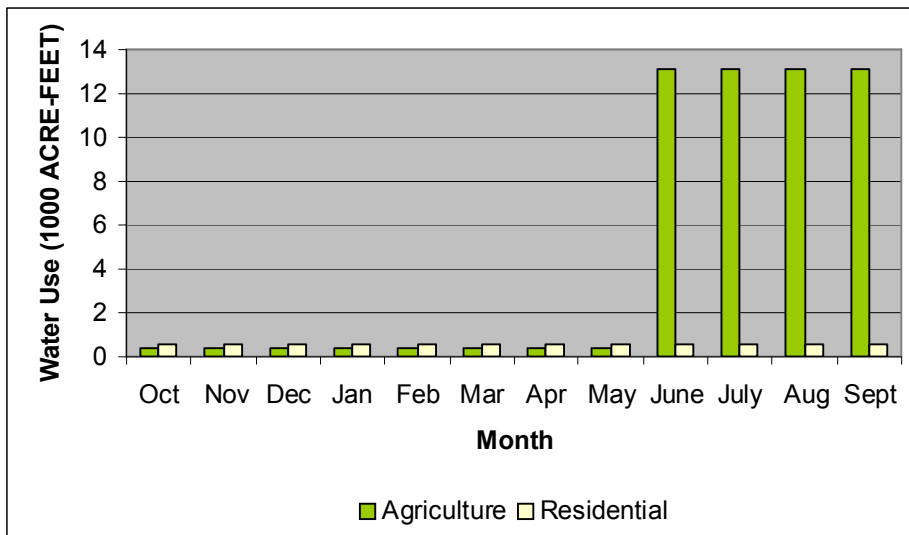


Figure 2.14: Monthly estimates of non-metered (termed non-PWS) use by major use type. (Figure generated by WRIA 1 staff base on USU use estimates.)

Figure 2.14 provides a breakdown of non-PWS by major use type. Note that of the three types of uses (agriculture, residential, commercial/industrial); commercial/industrial is not included in the figure for non-PWS. It was not included because the volume is insignificant compared to agricultural and residential uses and does not show on the graph. As shown in the figure, agriculture dominates water use in the summer months due to irrigation requirements (Hardy et al., 2002).

Figure 2.14a provides an illustration of the percent overall water use for the major use categories. As can be seen, metered use accounts for 52% of total annual water use in WRIA 1, followed by an estimated 43% for agricultural uses and an estimated 5% for non-metered residential uses.

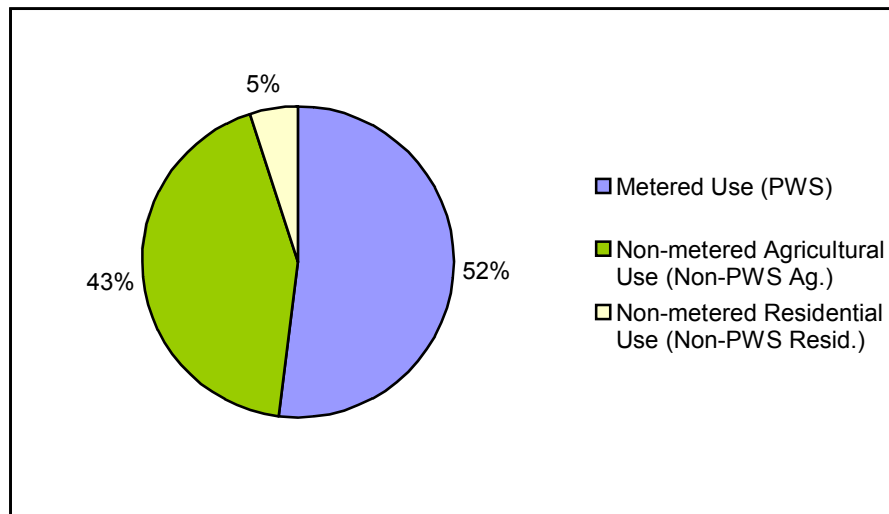


Figure 2.14a: Total annual percent water use for major categories of use in WRIA 1. (Figure generated by WRIA 1 staff based on USU use estimates.)

It is important to note that all categories of water use estimates are subject to some level of estimation error. Although the errors cannot be rigorously quantified, USU concluded that metered public water system data were the most accurate (typical 2% error), non-metered residential, commercial and industrial use estimates are likely to be accurate within those typical for engineering planning and design, while the agricultural estimates are likely to be high. The WRIA 1 WMP- Phase 1 long-term monitoring program (Section 3) includes a recommendation for updating and continuing to refine water use estimates.

ECONorthwest identified an approach for estimating future water use. There are a number of limitations to the methodology that will need to be evaluated in terms of their significance. This approach is described in of the ECONorthwest document titled “Summary of Economic Conditions in WRIA 1.”

Model Evaluation/Recommendation and Future Data Needs

The purpose of this task was to describe, compare, and evaluate different surface water quantity computer models that may be appropriate for use in WRIA 1 and to identify future data needs. Factors considered in evaluating the models included 1) input from caucuses (based on the DSS worksheets), 2) requirements of the WRIA 1 Project March 2000 Scope of Work, and 3) meetings with local project participants.

USU recommended that computer model selection be based on two principal factors: 1) the model's ability to simulate management options (e.g., changes in diversion, land use, or water rights) and 2) the degree to which the model can provide information that can be used by decision-makers where no data exists.

Based on these considerations, USU recommended developing a surface water quantity model with hydrologic and watershed model components integrated to function as one unit. The model recommended by USU and approved by WRIA 1 participants is an enhanced version of the rainfall model TOPMODEL combined with channel routing referred to as TOPNET. Although the model has WRIA wide application, the modeling results will not be uniform across WRIA 1 due to differences in available data. Details of the model evaluation, selection, and other considerations such as uncertainty are provided in the Phase II report *Review and Comparison of Hydrologic and Water Management Models for Use in WRIA 1* (Baldwin, Tarboton, and McKee, Task 4, 2001).

The other element of this task of the Phase II work was related to future data collection for surface water quantity and related meteorological data. USU provided initial recommendations based on four considerations: 1) quantification of the resource, 2) management needs, 3) standard error in estimating naturalized streamflow, and 4) the preliminary water balance results. Based on these considerations, USU recommended additional streamflow, SnoTel, and evapotranspiration gaging in a number of areas in WRIA 1. The additional data would improve the spatial coverage of data and reduce the uncertainty in the WRIA-wide gaging network.

Conceptual development of the surface water quantity model initiated under Phase II continued as an Early Data Needs (EDN) activity while the Phase III Scope of Work was being drafted. This modeling work was represented as EDN 14. The purposes of activities undertaken through EDN 14 were to begin model development and to demonstrate potential visualization strategies that would be completed under the Phase III work (Baldwin, 2002). The completed EDN 14 work describes the preliminary format of input and output tables along with a computer program that represents a “straw man” version of the WRIA 1 DSS surface water quantity components. Additional information is provided in, *EDN 14 Preliminary Water Quantity Model Development: Technical Studies for the WRIA 1 Watershed Management Project* (Baldwin, 2002).

USU Phase III work is focused on two main activities: 1) development and implementation of the surface water quantity models components and its integration into the DSS, and 2) validation of the model through the analysis of historical, existing, and full build-out conditions. Independent peer review of the models is included as part of the Phase III technical work, which is scheduled for completion in late 2005.

Ground Water Quantity

Ground water quantity Phase II technical work focused on developing a knowledge base with respect to WRIA 1 surficial aquifers¹⁰. This effort included compiling information related to:

- 1) Spatial delineation of aquifer systems and a description of the hydrogeology;
- 2) Hydraulic properties of the aquifer systems such as transmissivity, hydraulic conductivity, and storativity;

¹⁰ A surficial aquifer is the uppermost saturated zone and is typically under unconfined/water table conditions. The USU Phase II aquifer work focused mainly on surficial aquifers and did not include an investigation of deep aquifers within the study area (such as used by the City of Blaine). Additional work compiling information on deep aquifers is mentioned as a recommendation in Section 3 of this WMP. However, this recommendation is not expected to be the focus of work in 2005-2006.

- 3) Dynamic aquifer behavior, as expressed by water table fluctuations, and a compilation of available data with the purpose of preparing ground water table maps; and
- 4) Analyses of stream water records, precipitation data, and ground water recovery data to estimate water balance components, such as base flow and pumping rates.

This work was accomplished by reviewing existing hydrogeologic and geologic studies; available databases and GIS layers; analyzing seepage runs for selected watersheds; and comparing precipitation, streamflow, and baseflow for selected watersheds (Kemblowski, Asefa, and Haile-Selassje, 2002). The results of this work are provided in a report titled *Draft Phase II Ground Water Quantity* (Kemblowski, et al., 2002). An overview of the work is provided below¹¹. Similar to the other summary material presented in this plan, the report and overview provided below are not intended to include all of the maps and aquifer descriptions included in existing reports. Nor do they attempt to resolve delineation differences that may exist.

- *Hydrogeology and Spatial Delineation of Aquifer Systems*

As illustrated in Figure 2.15, the principal Sumas aquifers (surficial)¹² are grouped into three aquifer units: the Sumas-Blaine Surficial Aquifer, discontinuous surficial aquifers, and the Upper Valley Surficial Aquifers. The remainder of the WRIA 1 Project study areas is characterized as having Everson-Vashon (non-surficial) aquifer types (Kemblowski et al., 2002).

The lowlands of the study area (the western most portion of WRIA 1) have sand and gravel of glacial origin as their primary ground water reservoirs. In most lowland areas characterized by recessional outwash and alluvial deposits, there is one water table and

¹¹ It is important to stress that the actual report contains a substantial amount of information that is not covered in the overview including information on wellhead protection zones, potential sources of contamination, ground water movement/flow direction, geology, and soils.

¹² USU found that there is no standard naming convention for aquifers from one study to another. For the purpose of Phase II work, USU used the WRIA 1 naming convention. Aquifers are referred to by the WRIA 1 Project name, with the external document naming convention following in parentheses.

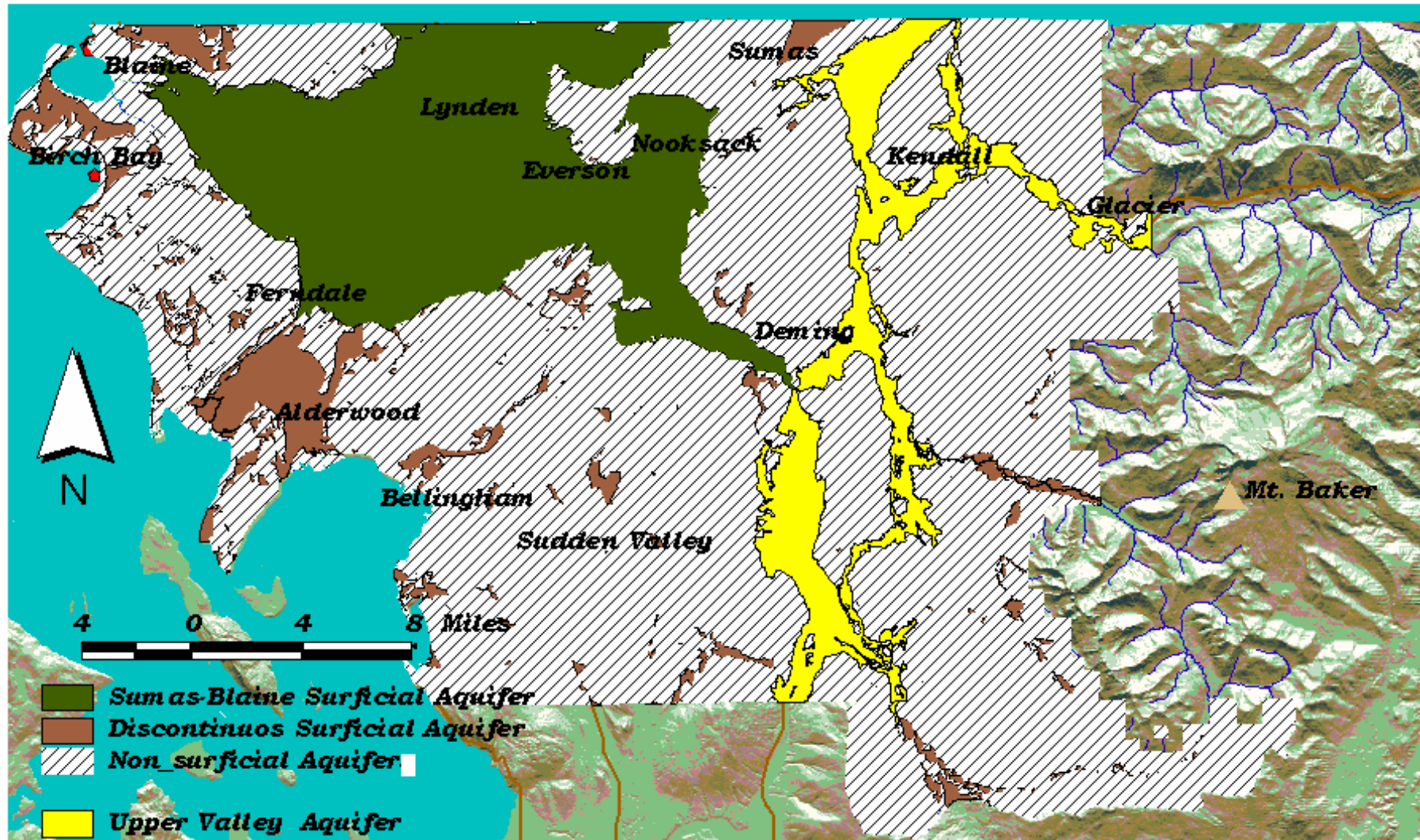


Figure 2.15: Location of surficial aquifers in WRIA 1 (Kemblowski et al., 2002)

nearly all wells drilled penetrate unconfined ground water. Elsewhere in the lowlands of WRIA 1 ground water occurs locally in discontinuous surficial aquifers, sand and gravel deposits within the Everson glaciomarine drift and Vashon drift, advance outwash (Esporance sand), and Chuckanut sandstone. Some of these aquifers are very productive. Rainfall is the principal means of recharge.

Ground water in the eastern portion of WRIA 1 is primarily restricted to the alluvial and sedimentary deposits along the major stream valleys of the North, Middle, and South Forks of the Nooksack River. Igneous and metamorphic rocks underlie these deposits and most of the area is characterized as not having ground water available in large quantities. The Sumas-Blaine Surficial Aquifer is the principal aquifer in the Nooksack watershed. It is located beneath the flat glacial outwash plain and has a water table that is typically less than 10 feet below the ground surface. It has a vertical depth ranging from less than 25 feet near Blaine to more than 200 feet at the northeastern edge of the aquifer. The discontinuous surficial aquifers are scattered throughout the WRIA. Due to a lack of sufficient well data, the definition of their lateral boundaries have been estimated using surface soil properties. These aquifers are found in many different geological deposits but they are usually thin and, therefore, may not be major sources of water. The Upper Valley Surficial Aquifers consist of interlayered mixtures of gravel, sand, silt and clay and are limited in extent by surrounding bedrock. Figure 2.16 identifies the locations of wells in each of the different aquifer types.

- *Aquifer Properties*

A variety of scientific reports were used to evaluate and compile information on hydraulic conductivity, transmissivity, and storage. Table 2.1 summarizes the results for eight different study areas. As part of the Phase II technical work, a number of GIS maps were prepared illustrating some of these aquifer properties. A map for the LENS area (Kemblowski et al., 2002) is shown in Figure 2.17.

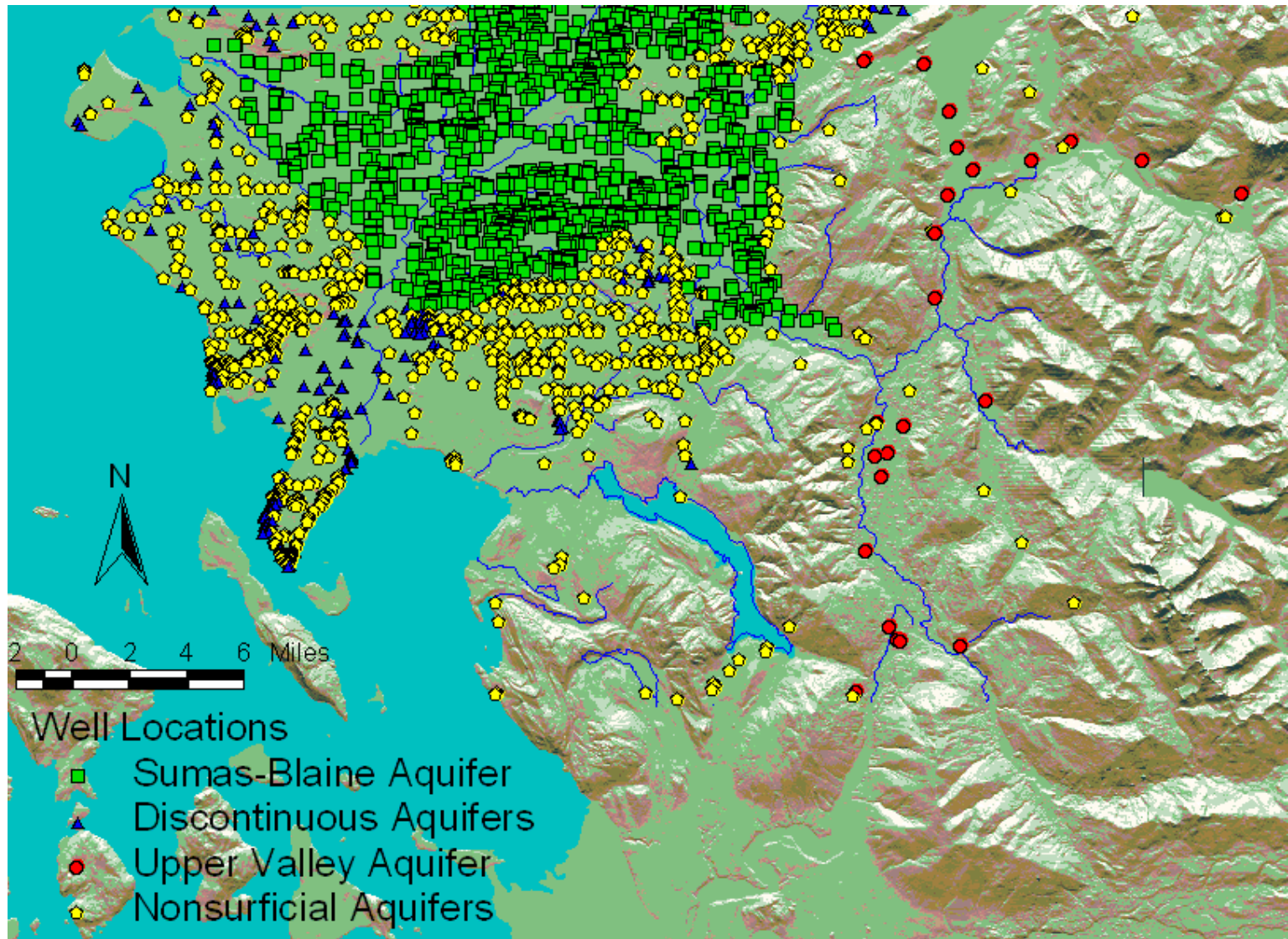


Figure 2.16: Location of wells associated with different aquifer types (Kemblowski et al., 2002)

Table 2.1: Summary of hydraulic parameters

Study Area	Parameters	Region	Range	Average	Source
LENS	Hydraulic conductivity (feet/day)	Sumas Aquifer	6.8 – 7,800	270 (median)	Cox and Kahle, 1999
		Everson-Vashon Semiconfining unit	3 - 160	81 (median)	
		Vashon Semiconfining unit	2.4 – 1,800	52 (median)	
		Bedrock Semiconfining unit	0.01 - 77	0.55 (median)	
Sumas Area	Hydraulic conductivity (feet/day)	Main study area	10 – 3,000		Associated Earth Science Inc., 1995
		Transition zones	250 - 600		
Johnson Creek	Hydraulic Conductivity (feet/day)		1.07 - 298	48.5 (geometric mean)	Gibbon and Culhane, 1994
	Transmissivity (feet ² /day)		138.2 - 66580		Golder Associates, 1992
Pole Road, near Lynden	Transmissivity (feet ² /day)			2860	Water Resources Consulting, LLC, 1997
	Hydraulic conductivity (feet/day)			63	
Strandell wellfield, Everson	Transmissivity (feet ² /day)	East Well		15,840	Converse, 1993
		West Well		10,080	
	Storage Coefficient	East Well		0.1	
		West Well		0.2	
Puget Sound Lowland	Transmissivity (feet ² /day)	Qso Unconfined Aquifer	700 – 23,400	5,000	Didricksen, 1997
		Qv Confined or Semiconfined	40 – 13,500	2,000	
	Storage Coefficient	Qso Unconfined Aquifer	0.1 – 0.3		
		Qv Confined or Semiconfined	0.001 – 0.00001		
Lummi Indian Reservation	Transmissivity (feet ² /day)		470 – 2,400		USGS, 1971

1

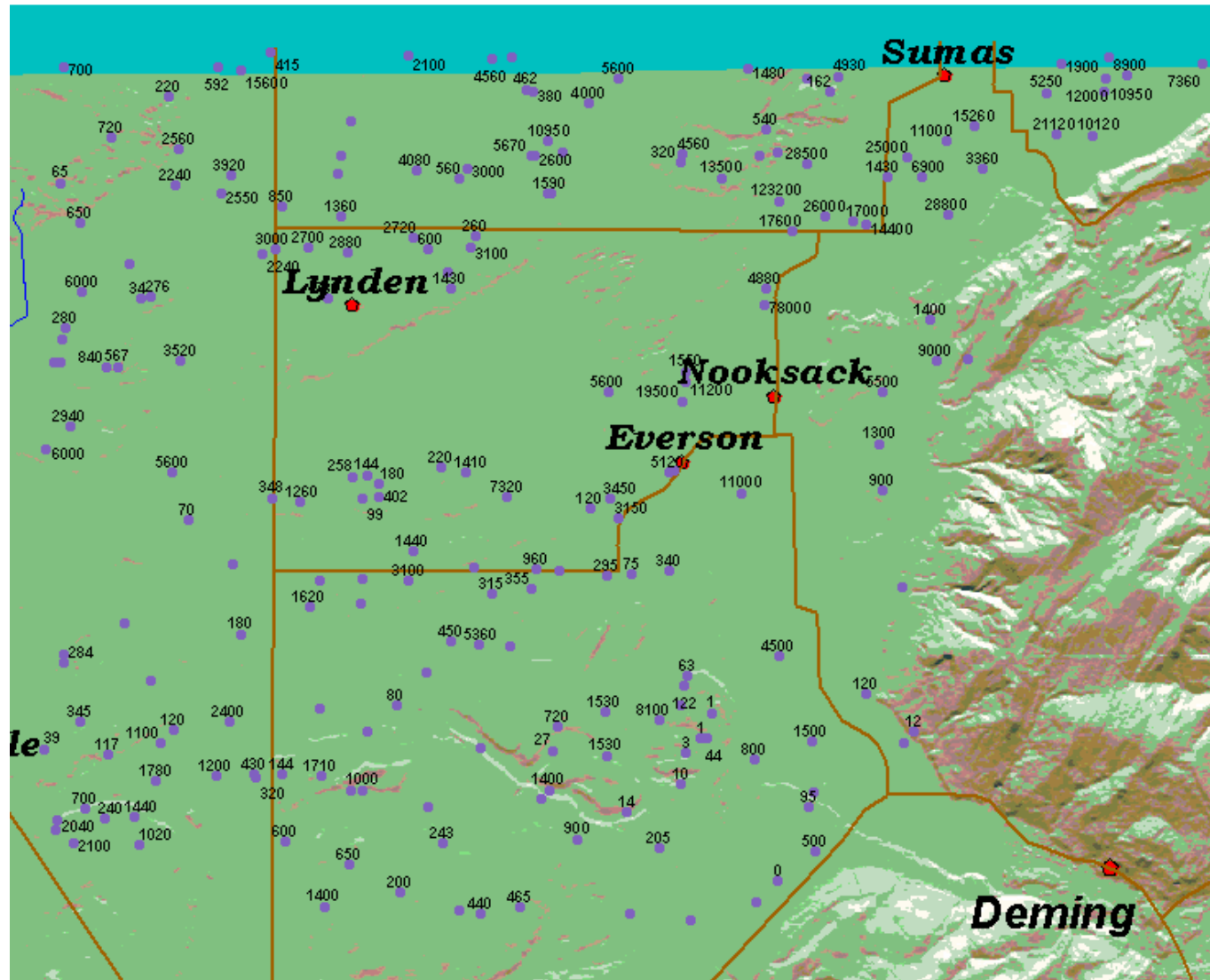


Figure 2.17: Hydraulic conductivity values (feet/day) for the Lynden, Everson, Nooksack, and Sumas (LENS) area. (Kemblowski, et al., 2002)

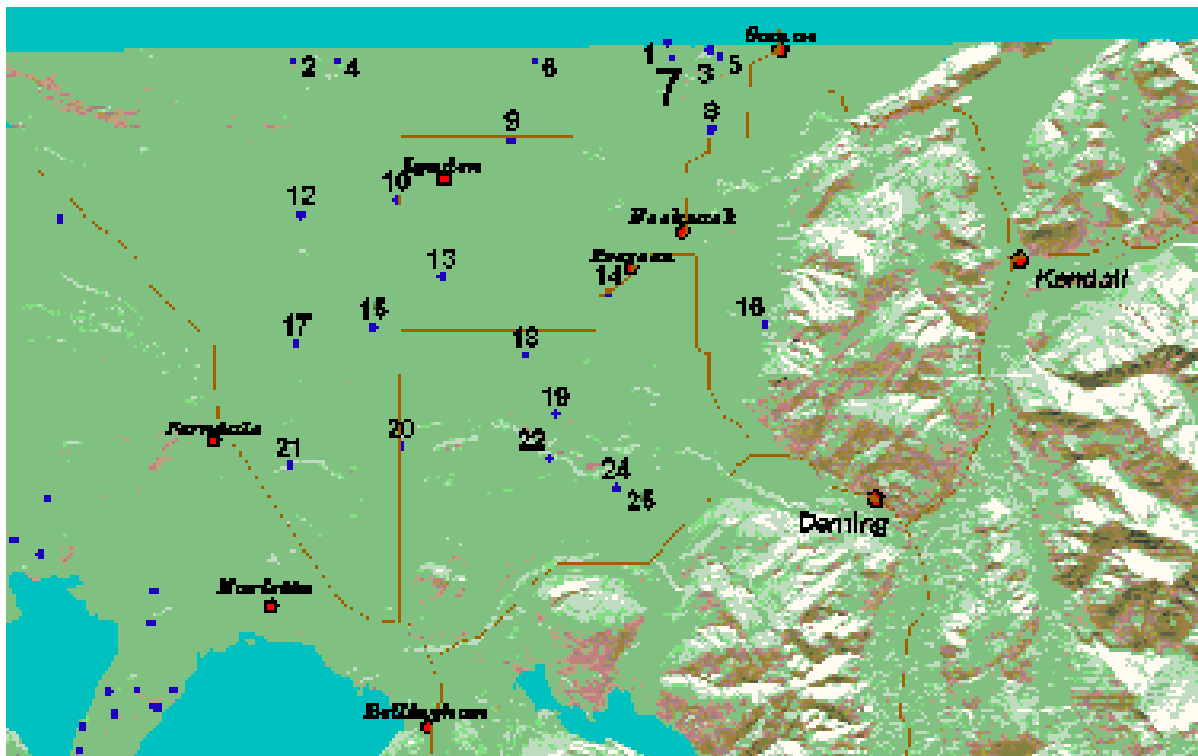


Figure 2.18: Location of wells in the central lands with a period of record of well water level data greater than 12 months (Kemblowski et al., 2002)

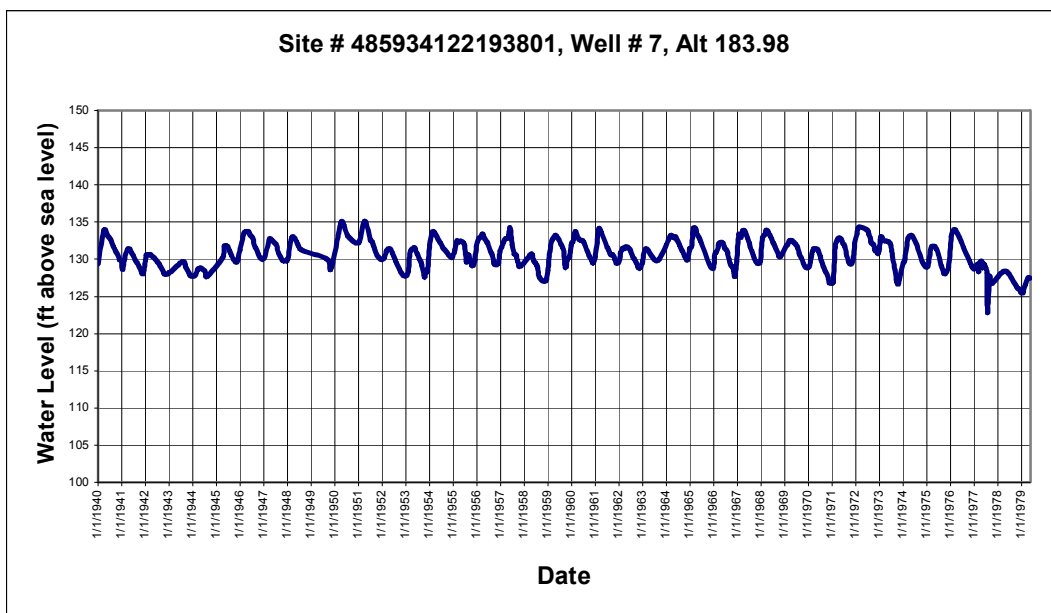


Figure 2.19: Time series for well number 7 of Figure 2.18. (Kemblowski et al., 2002)

- *Ground Water Table*

In order to understand the spatial and temporal behavior of the ground water table, USU prepared a series of ground water table elevation contour maps and time series plots for wells whose measurement record was longer than one year (Hardy et al., 2002).

Figure 2.18 shows the locations of a number of wells that USU examined that had a measurement period longer than 12 months (although most had less than 2 years of measurements). Figure 2.19 shows the time series of water table elevations for well number 7 in Figure 2.18. The period of record for this well extends from 1940-1979. USU concluded that despite the periodical fluctuations seen, there does not seem to be any indication of an annual trend in ground water elevation in well number 7. USU also noted that additional, more recent data are needed.

- *Water Balance*

In anticipation of modeling work to be conducted under Phase III, USU's Phase II technical work included evaluating and estimating key water balance components (base flow, ground water recharge, stream flow, and precipitation) for the following watersheds:

- North Fork Nooksack
- South Fork Nooksack
- Middle Nooksack
- Dakota Creek
- Fraser
- Fishtrap
- Tenmile

The base flow separation was performed using the USGS public domain software called HYSEP. For most watersheds, the analysis showed that the climatic conditions and ground water regime have not changed during the period of record. For example, Figure 2.20 shows the cumulative precipitation and base flow in the South Fork of the

Nooksack River at Wickersham. This figure illustrates that, in spite of small localized fluctuations, the base flow in the Nooksack South Fork remained constant during the period 1967-1975 (Hardy et al., 2002).

USU noted that one strong exception to this behavior was the base flow difference between the Lynden and Deming gages. For this section of the river, cumulative base

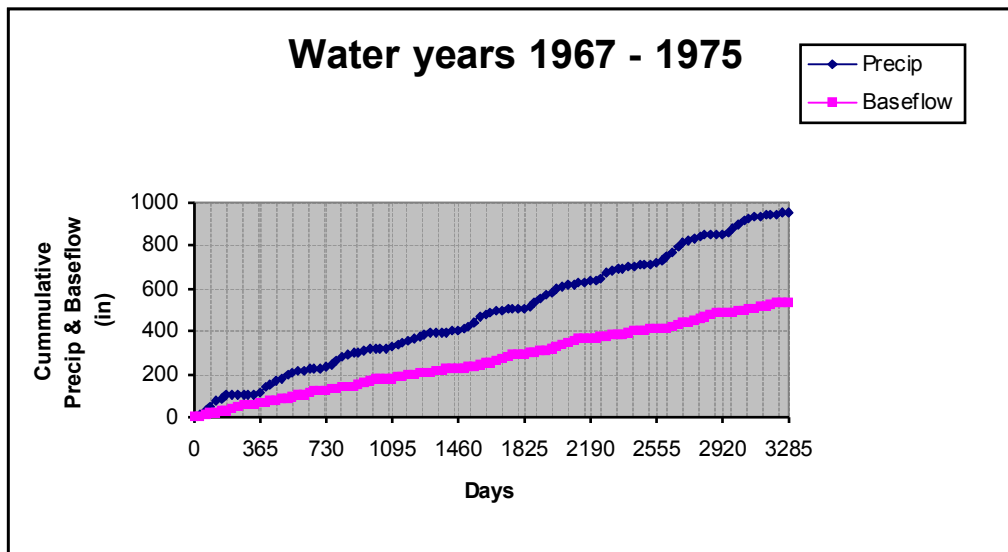


Figure 2.20: Cumulative precipitation and base flow, South Fork Nooksack, 1967-1975. (Hardy et al., 2002)

flow is very irregular. Based on conversations with the USGS personnel and others, USU feels that these irregularities are due to the unreliability of the Deming streamflow gage due to an unstable channel that does not allow for an accurate stage-discharge relation to be developed.

As part of the Phase II and EDN technical work, a seepage run along the mainstem Nooksack River was completed by USU. The USGS had performed similar seepage measurements along the South Fork Nooksack River in 1998 and 1999 and performed streamflow measurements in tributaries in support of the mainstem USU seepage run as part of an agreement with the Lummi Nation, Nooksack Indian Tribe, and the Bureau of Indian Affairs. Seepage runs are used to provide estimates of the amount of water moving from ground water into a stream or from the stream into the surrounding ground

water over a given reach of the stream. USU analyzed the seepage run data to estimate the stream flow gain in cubic feet per second per river mile. The results showed that there are substantial differences between areas. For example, some areas such as the South Fork showed fairly constant gain (Figure 2.21) and others such as the mainstem of the Nooksack showed gains and losses (Figure 2.22). This information may be significant in terms of evaluating stream-aquifer interactions and the implications of different management actions.

Based on the results of the work previously outlined and through the involvement of local WRIA 1 Project participants, the original focus of the Phase III ground water quantity work was to further the understanding the hydraulic connection between streams and their surrounding aquifers.

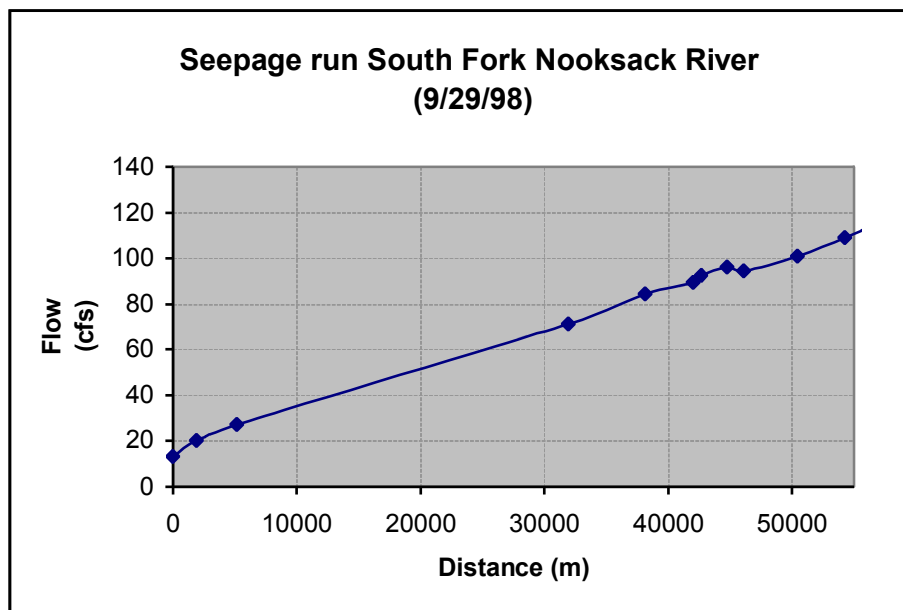


Figure 2.21: Results of seepage run for the South Fork of the Nooksack River (Hardy et al., 2002)

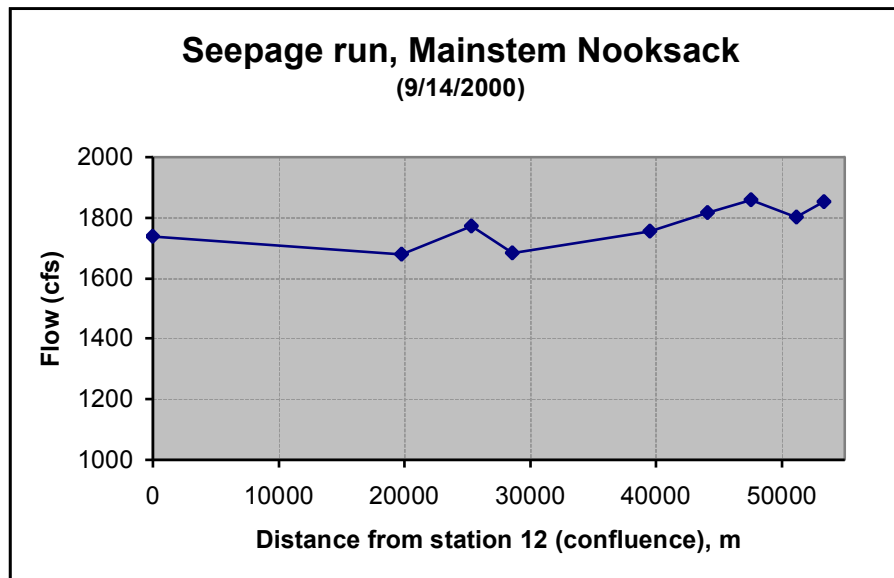


Figure 2.22: Results of seepage run for the mainstem of the Nooksack River (Hardy et al., 2002)

The purpose of focusing the original Phase III work in this way was to support the coarse analysis of management actions such as:

- Changing withdrawals from a surface water source to a ground water source;
- Changing the distance (location) of a ground water withdrawal from a stream;
- Changing the amount and/or timing of withdrawals;
- Developing additional ground water recovery strategies; and
- Changing land uses.

Specific tasks in the original USU Phase III Scope of Work focused on the development and testing of appropriate models and their integration into the WRIA 1 Decision Support System. This effort also included developing a single well application module that would enable a user to evaluate the likely hydrologic effects of a single well (independent of other wells).

Since the adoption of the USU Phase III Scope of Work in May of 2002, WRIA 1 Project participants, consultants, and USU scientists and students, have had significant discussions regarding the approach for developing the ground water quantity model. The

discussion focused on the merits of a single-layer versus multi-layer model based on data availability and which type of model would provide greater benefits to the WRIA 1 Project into the future. The original Phase III Scope of Work was developed around a simple single layer aquifer model that would allow evaluation of the surficial aquifer that is currently the primary source of ground water throughout WRIA 1. During the scheduled “check-point” for the technical work, the topic of model the ground water construction was revisited. Subsequent to the check-point meeting, several discussions and workshops were held between USU investigators, private consultants, and WRIA 1 technical teams on several issues: (a) the need for a comprehensive ground water quantity model, (b) the lack of data especially for the deeper aquifers, (c) potential limitations of a multi-layer model in the absence of adequate data for model calibration and verification, and (d) the possibility of using the single-layer model already developed by USU as a placeholder until sufficient data are collected to develop a realistic, calibrated, and verified multi-layer ground water quantity model for long-term use in WRIA 1 analyses. The eventual outcome of these discussions was a recommendation for the development of a multi-layer model. Based on these discussions, in January 2004 USU produced a preliminary draft conceptual model report, *Ground Water Modeling of the Lowlands of WRIA 1 Watersheds*, for a five-layer ground water model using MODFLOW, which discussed the available data and potential data limitations in the deeper aquifers. The model would consist of five layers: specifically, three aquifers and two semi-confining units.

During the December 2003 revisions to the USU Phase III Scope of Work, the development of the ground water model was deferred due to resource constraints associated with pursuing the recommendation for the comprehensive multi-layer model and associated unresolved issues previously described. Efforts are underway to develop a strategy for completing the ground water model and integrating it into the DSS. Until this occurs, the DSS will have limitations in accommodating the influence of ground water dynamics in surface water quantity analysis. For example, recharge from streams to ground water will not be represented; temporal storage effects on baseflow gain will

not be represented as well; and baseflow in streams will be less accurately represented (Tarboton, 2003).

Water Rights/Water Law

The WRIA 1 March 2000 Scope of Work requires gathering of information on Washington State water rights and Federal reserved water rights. This information is essential to the understanding of how much water has been legally obligated and how much additional water has been requested. In combination with information on the physical availability of the resource, water right information helps describe from a legal perspective how much water is available to meet current and future needs and the challenges that exist in WRIA 1.

Both state and federal water rights have requirements associated with out of stream (consumptive) uses and instream (non-consumptive) use. Out of stream requirements pertain to water that is removed from a particular water body (e.g., stream, lake, ground water) and put to a beneficial use such as for drinking, irrigation, hatcheries, municipal, and commercial/industrial uses. Instream requirements pertain to the amount of water needed to protect and preserve instream resources and values, such as fish, wildlife, and recreation. Instream flows based on state water law are most often described and established in a formal legal document, typically an adopted state rule. Chapter 173-501 Washington Administrative Code describes the current instream requirements for WRIA 1. Summary information on Washington State water

Concerns Surrounding Water Rights in WRIA 1

- *Water right decisions have become increasingly difficult, complex, and controversial due to a number of factors*
- *Some users that should have a water right do not have one.*
- *Some users are using too much water or are using water in places outside the requirements of their right.*
- *The possibility that water has been over-allocated in some areas in WRIA 1.*
- *A large backlog of water right applications exist.*
- *Very few permit decisions are made due in part to staffing limitations.*
- *Many of the decisions made are protested.*
- *There is a lack of funding for assessment, regulation, and enforcement.*
- *Conflicting and unclear case law.*
- *Potential Tribal/Federal Reserve Rights in the Nooksack watershed create uncertainty for all potentially junior users.*

rights will be discussed first, followed by actions associated with Federal reserved water rights.

Washington State Water Rights

This section on state water rights will begin with a summary of out of stream water rights followed by an overview of the existing instream flow requirements. Instream requirements and out of stream water rights are integrally linked and both must be evaluated to understand the legal constraints that currently exist for meeting existing and future needs. This section is intended to provide summary information of the topic and is not to be interpreted as being inclusive of all the legal complexities and viewpoints associated with Washington State water law. For expanded information on Washington State water rights and applicable laws, contact the Washington State Department of Ecology and/or link to www.ecy.wa.gov/programs/wr/rights/water-right-home.html.

Out of Stream Rights

Background

Washington State law requires certain users of public water to obtain approval from the Washington State Department of Ecology prior to actual use of the water. Approval is granted in the form of a water right permit or certificate. In addition to state authorized

State Water Right Terminology

- *Application* – An application is the paperwork sent to Ecology requesting the legal authorization to use water.
- *Water Right Permit* – A permit is permission given to a water right applicant by the state to develop a water right. Water rights are developed when the applicants follow the provisions outlined in their permit, using water for the purposes and up to the limits stated in the permit. Water right permits remain in affect until the water right certificate is issued, if all terms of the permit are met, or the permit has been canceled or if the right has relinquished due to voluntary non-use of all or a portion of the water.
- *Water Right Certificate* – A certificate is issued by Ecology to certify that water users have the authority to use a specific amount of water under certain conditions. These conditions are based on beneficial use of water under the water right permit. The water right certificate is a legal document recorded at the county auditor's office. The certificate completes the process of obtaining your water right. Once a certificate is issued, no expansion is allowed under that water right. The certificate stays with the land.
- *Water Right Claim* – A water right claim is a statement of claim to a water use that began before the State water codes were adopted and is not covered by a permit or certificate. A claim may represent a valid water right if it describes a surface water use that began before 1917, a riparian surface water use that began before 1932, or a ground water use that began before 1945. Water right claims were filed with the state during several open filing periods designated under RCW 90.14 (the Water Right Claim Registration Act).

water rights, Washington State recognizes valid water right claims¹³ and Federal reserved water rights.

All use of surface water, which is water withdrawn from a river, creek, lake, pond, spring or any other source where the water is visible on the earth's surface, requires a water right or certificate. Ground water use (water for which the source or point of withdrawal is below ground such as wells and springs before they emerge at the surface) is governed by the same state water laws and regulations as surface water. There is one exception in that if a cumulative total of less than 5,000 gallons a day is being pumped, the prospective water user is exempt from the process of applying for a water right permit. Although the water users withdrawing ground water under the exemption are not required to obtain a permit from Ecology, withdrawing ground water under the exemption establishes a water right that is subject to the same privileges and restrictions as a water right permit or certificate obtained directly from Ecology. (Washington State Department of Ecology, 2004, Publication #F-WR-92-104) This exemption clause in state law is often referred to as an "exempt well" under RCW.90.44.050, which reads:

“any withdrawal of public ground water for stock-watering purposes, or for the watering of a lawn or of a noncommercial garden not exceeding one-half acre in area or for single or group domestic uses in an amount not exceeding five thousand gallons a day, or for an industrial purpose in an amount not exceeding five thousand gallons a day, is and shall be exempt from the provision of this sections...”

It is worth noting that persons falling under the "exempt well" clause may still apply to the Department of Ecology for a water right permit.

(Washington State Department of Ecology, 2004, Publication #F-WR-92-104)

A water right is a legal authorization to use a certain amount of public water for a designated purpose at a specified location at a specified time of year. A water right is

¹³ Refer to text box in subsequent section for a definition of "claim".

obtained by first filing an application with the Department of Ecology for a water right permit that, if granted, enables the applicant to begin putting the water to use in accordance with the terms of the permit. After reviewing the application, the Department of Ecology will issue a water right permit if the proposed water use meets the following conditions: 1) the water will be put to a beneficial use; 2) the water use will not result in an impairment to an existing or senior water right (this includes instream flows); 3) water is found to be available for the appropriation; and 4) the issuance of the requested water right will not be detrimental to the public's welfare. Applying for and obtaining the permit is a step in acquiring a water right; it is not the water right. The water right is granted when the Department of Ecology confirms that all the conditions of the water right permit have been met. This confirmation is made by the Department of Ecology with the issuance of a Certificate of Water Right, which is the legal record of your water right and is recorded at the county auditor's office. Typically, water right certificates remain attached to the land described on the water right (Washington State Department of Ecology, 2004, Publication #96-1804-S&WR).

*Stage I Water Rights Results –
A Word of Caution*

- *Stage I results are a “paper” exercise. Some of these rights may no longer be valid but more work is needed to determine their validity.*
- *Stage I results do not indicate how much water is actually being used. Even if a right is valid, it does not mean the specified amount of water is actually being used. Some people use more water than indicated by their right and some people use less. In addition, some people are using water that do not require a “paper” water right (“exemptions”).*
- *Tribal and Federal reserved water rights need to be considered to fully understand how much water has been legally appropriated.*

The date in which a water right is obtained is important under state law because in times of water shortage, senior (older) water right holders have their water needs satisfied first, rather than all users sharing water proportionally. This is because water in Washington State, similar to most western states, is allocated pursuant to the prior appropriation doctrine, which is more commonly stated as “first in time, first in right.”

Methods/Results

The goal of the water rights work of the WRIA 1 Project was to investigate all of the existing water right claims, applications, permits, and certificates on file with the Washington State Department of Ecology. The desired outcome of the work included a database and associated map developed to the land parcel level that showed the actual water use if known, the source of water, the legal right to use water and the potential for future water availability. The water rights work was intended to be completed in four stages with each stage further refining the understanding of the status of water rights in WRIA 1. PUD No. 1 contract staff has completed two stages of the water rights work.

Stage 1 Water Right Summary

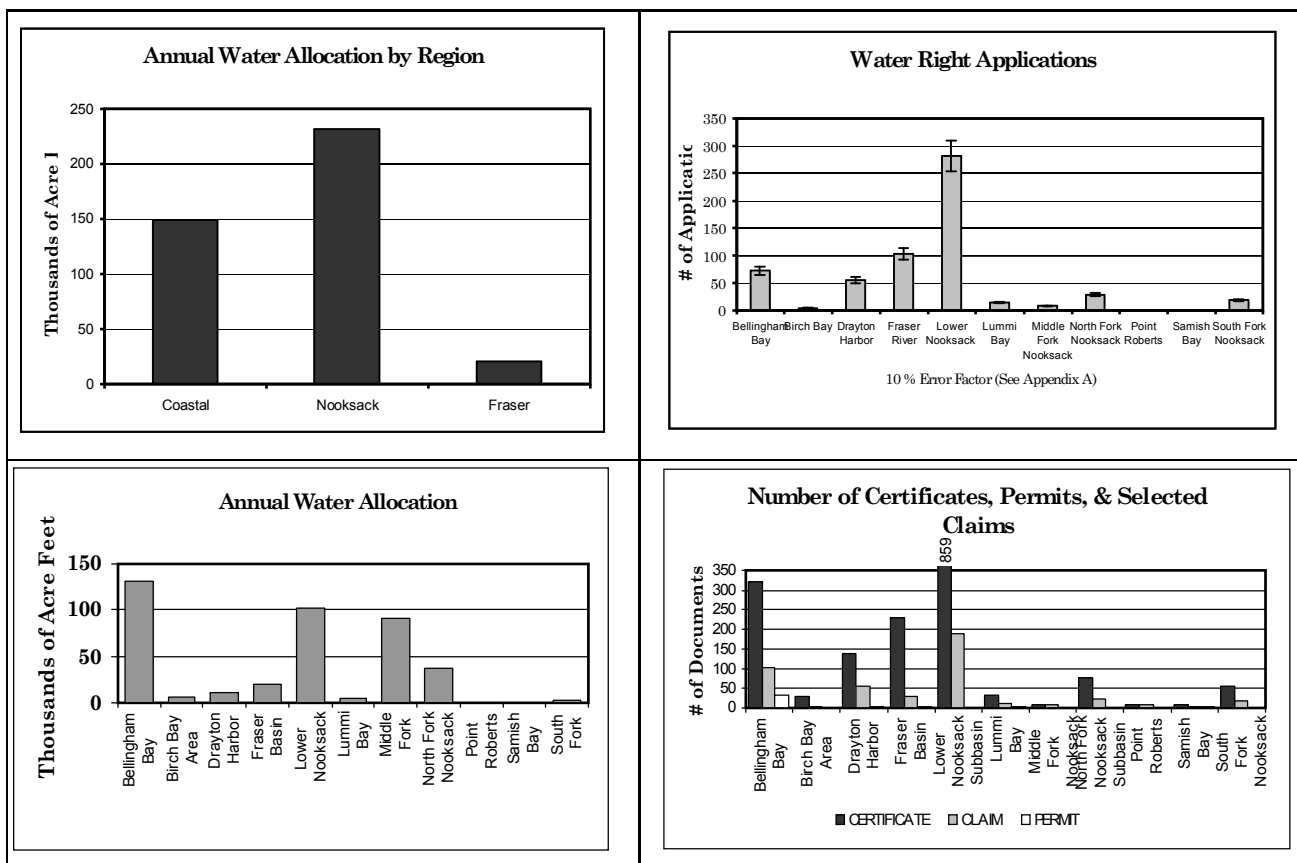


Figure 2.23: Summary of annual water allocation by region, and applications, certificates, permits, and selected claims for WRIA 1.

Additional work will be needed to complete the remaining stages and meet the original goal.

The purpose of the Water Rights Stage 1 work was to estimate the amount of surface and ground water allocated on “paper” based on claims in the water rights claims registry, water use permits, and certificated rights. This was completed using the existing Ecology documents and database for each area delineated in the *WRIA 1 Surface Water Drainage Boundary Map Version 1*. Work conducted by PUD staff also included identifying the priority date of the water rights and mapping the parcel, the authorized point of withdrawal or diversion, and the authorized place of use (due to data limitations, 2,412 of the 7,211 total documents were mapped to the parcel, 4,799 were mapped to the section). Figures 2.23 and 2.24 provide a summary of the Stage 1 water right

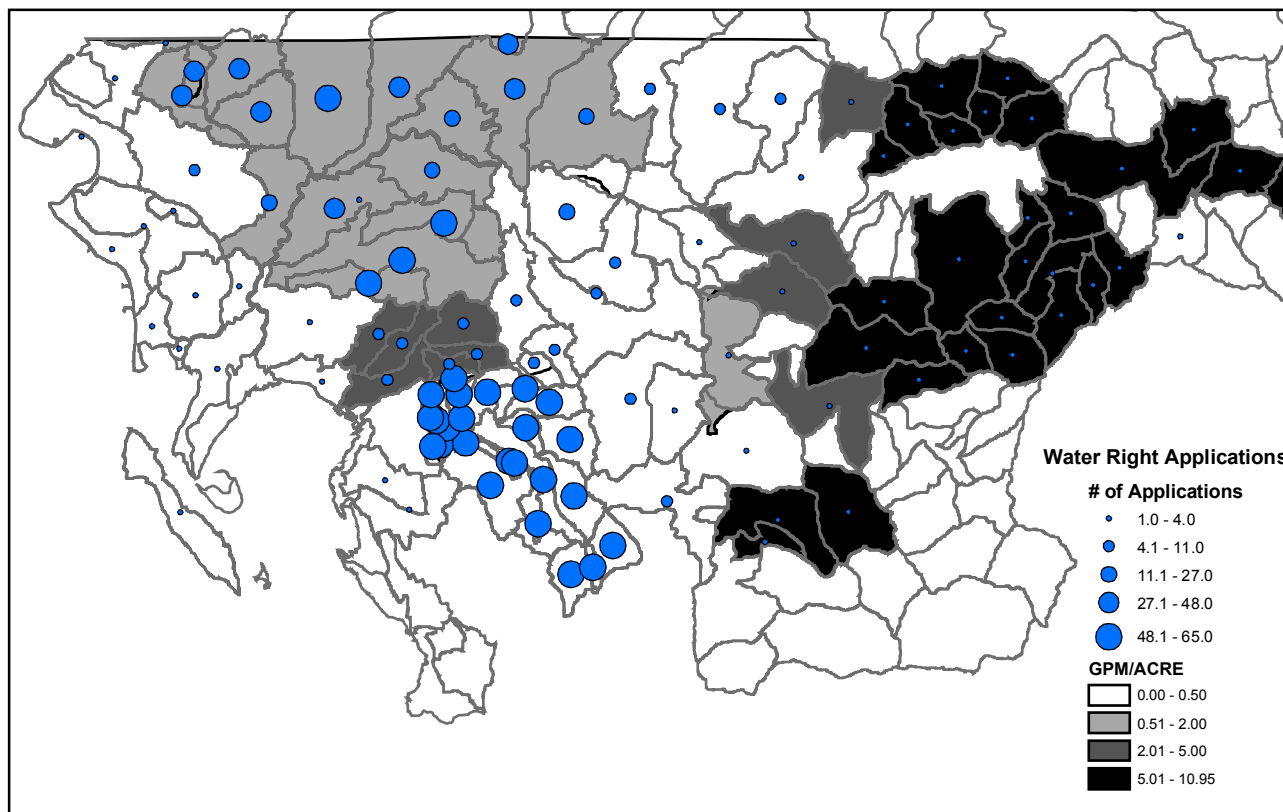


Figure 2.24: Water right applications and associated water volumes for drainages within WRIA 1 (Atkeson and Gill, 2001)

information. Substantial additional details on the methods used, cautions, and results can be found in the Stage 1 report titled, *WRIA 1 Water Rights Summary By Delineated Area - Water Rights Review Stage I Report Final Version*, (Atkeson and Gill, 2001).

The emphasis of the Stage 2 Water Rights work was on public outreach and education. Property owners and public water systems were provided an opportunity to obtain water right documents and general water right information, including information on the process to protect and/or change their water right (if necessary). During Stage 2, the PUD contract staff made 909 contacts with people related to 1718 water right documents. Stage 2 actions and results are provided in a report titled *Water Rights Review Stage 2 Report: WRIA 1 Water Right Outreach* (Atkeson and Gill, 2003). Electronic versions of WRIA 1 Water Rights Database (Access 2000), GIS files (ArcView 8.2) and microfiche films of certificate files were developed and provided to interested parties.

Existing Instream Flows

Washington State Department of Ecology established minimum instream flows in WRIA 1 in January 1986. The specific requirements are described in Chapter 173-501 Washington Administrative Code (WAC). As described in the code, the purpose of the instream flow requirements is “to retain perennial rivers, streams, and lakes in the Nooksack water resource inventory area with instream flows and levels necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental

**Ground Water Withdrawals
are Affected Too**

The instream flow requirements have come to affect more than just withdrawals from streams and lakes – ground water withdrawals are also affected due to their “hydraulic continuity” with surface water. Hydraulic continuity is the natural interconnection of ground and surface water. An aquifer is in hydraulic continuity with wetlands, lakes, streams, rivers or other surface water bodies whenever it is discharging to or being recharged by those surface water bodies.

The State Court of Appeals ruled in Hubbard v. Department of Ecology (1994) that hydraulic continuity might exist even when the point of withdrawal of the ground water is several miles removed from the affected stream. It upheld Ecology’s conditioning of a ground water right with instream flows in the Okanogan River, based on continuity between the aquifer and river, even if the effect of pumping on the flow of the rivers would be small and delayed. The decision affirmed that where surface and ground water is connected, minimum flows established by rule are treated as appropriations and should be protected from any impairment by any subsequent ground water appropriation.

values, and navigational values, as well as recreation and water quality”. Water rights issued after the adoption of such flows are subject to those flows and may be curtailed when the flows are not being satisfied. The minimum instream flows adopted in 1986 were developed using accepted (and in some cases state of the art) methodologies for that time. The associated regulation was developed and adopted through a series of public meetings and a public hearing conducted in the Nooksack River basin, which included solicitation of and response to comments. The instream flows established by this rule are water rights under Washington law and are protected like any other right in the priority system.

The instream flow requirements developed through that process have resulted in use restrictions on many WRIA 1 streams and lakes. Some of these restrictions on water sources include year-round closures to additional water withdrawals and some are closed part of the year (generally during the irrigation season). When a project is proposed on a stream that is closed to further appropriation, Ecology will deny the application unless the project proponent can demonstrate that the project does not conflict with the intent of the closure. In addition, ground water withdrawals are affected due to their potential (and in some cases, proven) “hydraulic continuity” with surface water. Figure 2.25 provides an overview of the closure status within WRIA 1.

Instream flows represent perhaps the most significant challenge in WRIA 1. While the flows were established to ensure protection of instream uses, they have come to have major impacts on subsequent out of stream uses as well. Concerns associated with existing instream flows include:

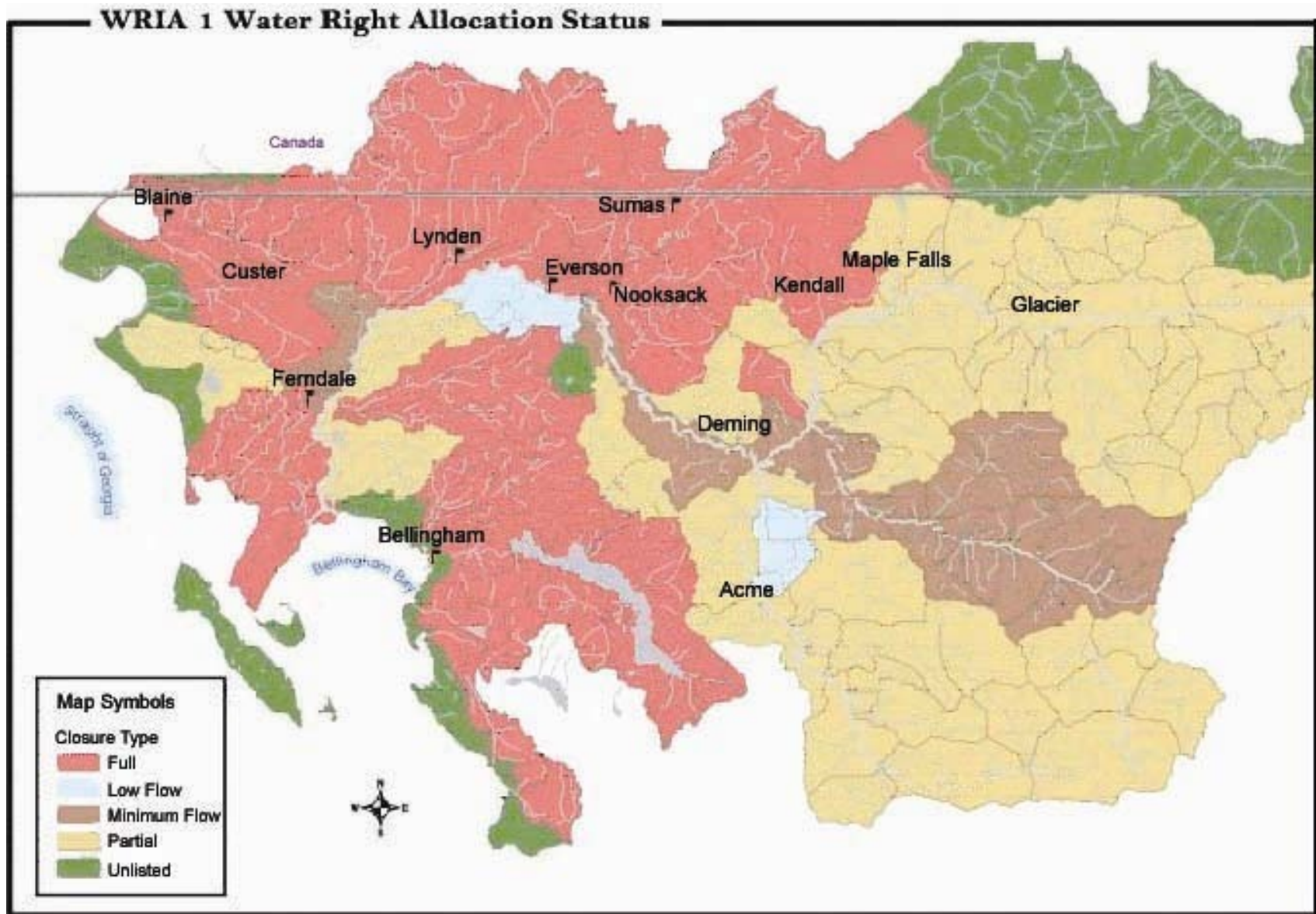


Figure 2.25: Overview of closure status within WRIA 1 (figure produced by PUD contract staff)

- Based on the limited streamflow data collected, it is clear the established instream flows are not met in many areas of WRIA 1 at many different times of the year – in fact, the natural flow of rivers and streams often does not satisfy the established flows¹⁴;
- There have been advances in the methods used to evaluate instream needs and the methods used to establish the 1986 flows may not reflect the best available science;
- There is no mechanism to ensure that instream flow needs can be met (whether they are the 1986 flows or new flows).

For more information on Federal reserved water rights, refer to Appendix C – Instream Flow Action Plan

Based on these concerns, the decision was made early on in the WRIA 1 Project to employ the latest and best available science to evaluate instream flow needs. The approach used to conduct the technical work is described in Section 2.3.1.5. The strategy describing how this technical information will be used to reevaluate existing instream flows is described in Section 3.

Federally Reserved Water Rights

This section is intended to provide summary information of Federal reserved water rights and is not to be interpreted as being inclusive of all the legal complexities and viewpoints associated with the topic. A report prepared for the Washington State Legislature in 2002 by the Washington State Attorney General’s office provides expanded information on the topic of Federal and Indian reserved water rights, including addressing them in the context of Washington State water law.¹⁵ It is important to note

¹⁴ It is important to note that the flows established by Ecology were not intended at the time to indicate how much water Ecology wanted to see in those streams and rivers. The instream flows were an indication of what fish required for survival. Where it was clear that sufficient water did not exist to satisfy the flows, Ecology closed the water bodies to further water rights in order to keep the situation from getting worse.

¹⁵ The report titled, *Federal and Indian Reserved Water Rights- A Report to the Washington State Legislature by the Office of the Attorney General*, October 2002, representing the State’s view of the complexities associated with Federal reserved water rights is available on the Washington State website www.access.wa.gov.

that the referenced report is cited as a source of information that provides the State’s view of this topic and may not reflect the legal perspective of the other WRIA 1 participants.

Background¹⁶

The basic principle of Federal reserved water rights is that when the United States government withdraws land from the public domain, sufficient water is reserved either explicitly or implicitly to meet the purposes of the reserved land. Lands reserved in this manner include Native American tribal reservations, National Parks, National Monuments, National Forests, and military reservations. The concept of a Federal reserved water right originated in 1908 when the United States Supreme Court made the *Winters v. United States* decision about a Fort Belknap Indian Reservation water claim. In the *Winters* decision, the US Supreme Court held that when the US Congress or the President sets aside land out of the public domain for specific federal purposes, such as an Indian reservation, a quantity of water is reserved which is necessary to fulfill the specific federal purposes. Subsequent lawsuits and court rulings established that the “Winters Doctrine” also applied to other federal reserves including those previously noted. This doctrine addresses Federal reserved water rights that may be both consumptive (e.g., domestic/irrigation) and non-consumptive (e.g., fish hatcheries) in nature.

Although Federal reserved water rights are based on federal law, which takes precedence over state law, these water rights are frequently discussed and addressed in the context of state water law and in particular, the prior appropriation doctrine. In general, a Federal reserved water right has a priority date as of the date the land was withdrawn and the reservation created. However, for tribal lands, uses that predate the reservation (e.g., fishing) have a “time immemorial” date, and uses that originated with the reservation (e.g., agriculture, domestic, commercial, municipal, and industrial) have a

¹⁶ The report titled, *Federal and Indian Reserved Water Rights- A Report to the Washington State Legislature by the Office of the Attorney General*, October 2002, representing the State’s view of the complexities associated with Federal reserved water rights is available on the Washington State website www.access.wa.gov.

priority date of when the reservation was created. Because of this, most Indian communities have very senior priority dates compared to state water right holders.

By state law, the Department of Ecology must ensure that a newly authorized water use, a water transfer, or a change of water rights will not impair senior water rights. Since Federal reserved water rights are generally the most senior, can be large, and (as is the case in WRIA 1) they are not quantified, Federal reserved water rights have the potential to create serious water management problems in many watersheds. Until these senior water rights are quantified, water uses authorized under state law are uncertain and may lead to disputes as to whether the Federal reserved water rights are impaired.

In summary, Federal reserved water rights are an important consideration along with state water rights in efforts to address all existing and future water needs. Assertions of Federal reserved rights and related claims are considered by the Department of Ecology in the water right permitting process. The Federal reserved rights and related claims can be enforceable as senior rights based on their priority date. Under any circumstance, Federal reserved rights are based on principles of federal law and are not subject to the core limitations (e.g., abandonment/relinquishment) affecting state issued water rights. According to a 2002 report prepared for the Washington State Legislature¹⁷, unlike state water rights¹⁸, Federal reserved water rights are not subject to the “use it or lose it” requirements because the actual amount of water appropriated is to meet the purposes of the reserved land. The report goes on to say that Federal reserved rights may be used for any of the primary purposes of the reservation and changed from time to time among those purposes without obtaining state permission. Additionally, the types of purposes that may be considered to be “primary purposes” for quantifying an Indian reserved water right, and the extent to which water rights set aside for one purpose can be used for another are not clearly established.

¹⁷ The report titled, *Federal and Indian Reserved Water Rights- A Report to the Washington State Legislature by the Office of the Attorney General*, October 2002, representing the State’s view of the complexities associated with Federal reserved water rights is available on the Washington State website www.access.wa.gov.

¹⁸ The referenced 2002 report was prepared prior to passing of Washington Sate legislation that exempts municipalities from specified parts of the “use it or lose it” and abandonment features of state water law.

With respect to WRIA 1, this means that the Federal reserved lands, including those of the Lummi Nation, have claims to sufficient water to satisfy the purposes of their reservations; the purpose of which may be different now or in the future than it was historically. These consumptive (i.e., Winter's Rights) water right claims have a priority date of at least the date of reservation establishment, which for the Lummi Nation is the 1855 Point Elliot Treaty. In addition to the (consumptive) Federal reserved rights associated with the creation of federal reservations, tribes have also claimed non-consumptive, treaty-based reserved rights based on the need for access to their usual and accustomed fishing/hunting areas, and for the instream flows, water quality, aquatic habitat conditions necessary to achieve a fishery harvest sufficient to support a moderate standard of living as well as fish for ceremonial and subsistence purposes. Based on federal and state court rulings in other watersheds, it can reasonably be expected that treaty-based claims have a priority date of time immemorial.

Methods/Results

In WRIA 1, the Lummi Nation, Nooksack Tribe, U.S. Forest Service, and the National Park Service have Federal reserved water rights claims for the purposes of these federal reservations. The Instream Flow Action Plan described in Section 3.5 is the approach that is being used to support a process by which instream flows may be recommended for final resolution, in either a court proceeding or an Act of Congress, for these entities. Out-of-stream Federal reserved water rights may also be estimated for final resolution as part of this effort. This work will include resolution of off-reservation water rights and their associated priority dates.

Next Steps

There are a number of actions that remain related to water quantity. They are:

- Complete the revised Phase III Scope of Work tasks;
- Develop and implement a ground water quantity model strategy, including ultimate integration of the model into the DSS;

- Develop and implement a long-term monitoring program to support computer model building from initial recommendations provided by USU;
- USU will conduct training on the Water Quantity component of the DSS. Joint Board funding has been set aside for this task;
- Complete work on state water rights; and
- Complete and implement the Instream Flow Action Plan (Section 3).

2.3.1.4 Water Quality

Purpose/Background

The Water Quality goal stated in the March 2000 WRIA 1 Scope of Work is:

To ensure that the quality of our water is sufficient for current and future uses, including restoring and protecting water quality to meet the needs of salmon and shellfish, contact recreational uses, cultural uses, protection of wildlife, providing affordable, safe domestic water supplies, and other beneficial uses. The initial objectives of the water quality management strategy will be to meet the water quality standards.

To meet this goal, technical assessment work was completed that would assist WRIA 1 participants to more fully understand the nature and extent of water quality concerns in the study area and to evaluate strategies that could be taken to address the concerns. The technical assessment needs specifically identified in the March 2000 Scope of Work are:

- To examine the legally established/designated characteristic uses of each of the nonmarine water bodies in the management area;
- An examination based on existing studies of the degree to which legally established water quality standards are being met;

- An examination based on existing studies of the causes of water quality exceedances, including an examination of information regarding pollutants, point and nonpoint sources of pollution, and pollution-carrying capacities of water bodies in the management area. The analysis should take into account seasonal stream flow or level variations, natural events, and pollution from natural sources that occurs independent of human activities;
- An examination of any total maximum daily load (TMDL) designation established for nonmarine bodies of water in the management area, unless a total maximum daily load process has begun in the management area as of the date the watershed planning process is initiated under RCW.82.060 and provision of technical support for State of Washington TMDL personnel for any TMDL-related activities during the project period;
- Conduct necessary data collection and analysis to estimate TMDLs for fecal coliform (in progress), temperature, BOD, sediment, and other water quality attributes of concern in order to ensure water quality standards are being achieved; and

Legally Established or Designated Characteristic Uses, Water Quality Standards, 303(d) Lists and TMDLs – What Does it all Mean?

The federal Clean Water Act of 1972 required that states adopt standards for surface water quality. The Washington State Department of Ecology classified water bodies range from Class AA to C and include a Lake Class. Each class has certain uses of the water that it supports such as swimming, fishing, aquatic life, agriculture, and drinking water supplies. There are water quality standards that must be met to support the uses of each class of water.

Class AA waters support the broadest range of uses and have the most stringent water quality standards. Class C waters support fewer uses and have less stringent standards. Water quality standards identify limits for water quality measurements, which are referred to as parameters and are described in Chapter 173-201a WAC.

Another requirement of the federal Clean Water Act is found in Section 303(d) of the Act. This section requires Washington State to prepare a list of all surface waters in the state for which beneficial uses are impaired by pollutants and are not expected to improve within the next two years.

Waters on the 303(d) list require preparation of Total Maximum Daily Loads (TMDL). TMDLs are a tool to clean up polluted waters. TMDLs identify the maximum amount of a pollutant that may be released into a waterbody without impairing the uses of the water. This maximum pollutant load is distributed among the various sources that may be contributing to the pollution so that, when combined, the distributed amounts do not exceed the maximum pollutant load. Ecology's assessment of waters to place on the 303(d) list is guided by federal laws, state water quality standards, and the state's 303(d) policy.

Important Note: There have been recent changes in the State Water Quality Standards. For more information on existing standards and the changes, visit the Ecology website at www.ecy.wa.gov/programs/wq.

- An examination of existing data related to the impact of fresh water on marine water quality.

These requirements pertain to surface water quality. The March 2000 Scope of Work did not identify specific assessment actions for ground water quality. As a result, WRIA 1 Project participants in coordination with USU scientists determined the ground water quality technical work to be conducted. This work will be described later in this section.

Methods/Results

All of the work conducted for surface and ground water quality was undertaken by USU in coordination with WRIA 1 Project participants and in particular the Water Quality Tech Team (WQLTT). The actions and results for surface water quality are discussed first, followed by those for ground water quality.

Surface Water Quality

The initial (Phase II) work related to surface water quality focused on 1) creating a comprehensive electronic surface water quality database; 2) identifying the legally established designated uses for waterbodies in WRIA 1; 3) identifying compliance with legally established standards including 303(d) listing and potential causes of exceedances; and 4) identifying data gaps.

- Comprehensive Surface Water Data Base

Phase II work began by creating a comprehensive electronic database of existing surface water quality information. Recent and historic data were collected from many

USU investigators used the surface water quality database to evaluate water quality conditions in the WRIA 1 study area. In conducting these assessments, USU divided WRIA 1 into eight areas: South Fork; Middle Fork; North Fork; Nooksack River Tributaries; Mainstem Nooksack and Portage Bay; Drayton Harbor and the Drayton Harbor watershed; Sumas River; and Lake Whatcom. For each area, waterbody designations were identified along with any water quality impairments and potential causes for the impairments. The results of Phase II work are provided in a "WRIA 1 Surface Water Quality Data Collection and Assessment" (Stevens, Neilson, Horsburgh, and Dickey, 2001).

different agencies and organizations including Washington State Department of Ecology, Washington State Department of Health, drinking water purveyors, colleges and universities, wastewater treatment facilities, United States Geological Survey, Lummi Nation, Nooksack Tribe, federal and state fish and wildlife management agencies, and the US Environmental Protection Agency (Stevens et al., 2001). The data were incorporated into a Microsoft Access database and summary tables of the data sources and their characteristics were constructed as the data were obtained. Quality assurance information to support data quality objectives were also obtained whenever possible.

Building on the electronic database, a surface water quality “data viewer” was constructed to provide user friendly access to the database. The data viewer is a component of the decision support system and provides a user-friendly way to access, view, and analyze all of the water quality data in the database. A map of WRIA 1 is displayed on the computer screen along with various features, including locations of sampling sites. Users can select features of interest and examine associated water quality data, including selecting graphic and statistical options for evaluating the data.

- Identification of Legally Established and Designated Uses

With the exception of tribal reservation waters, which are not within state jurisdiction and are regulated/administered by the federal Environmental Protection Agency and the tribal governments, all waterbodies in WRIA 1 are designated as either Class AA (Extraordinary), Class A (Excellent), or Lake Class. All of the AA designations are in the North, South, and Middle Forks of the Nooksack River, and the tributaries to the Lake Whatcom watershed. Aside from lakes, which are designated as Lake Class, the remaining water bodies are designated as Class A. It should be noted that Washington State water quality standards have been changed but not yet implemented pending approval by the U.S. Environmental Protection Agency.

- Compliance Evaluation

USU compared the data in the eight geographic areas previously identified against the Washington State Department of Ecology’s Surface Water Standards (Chapter 173-201A

WAC) and the criteria used by Ecology to determine if a water body is impaired (Water Quality Program Policy 1-11, June 1997). Descriptive and other appropriate statistical and graphical data analysis were used.

In addition to their independent evaluation of water quality, USU identified and reviewed the water bodies that Ecology has already placed on the 303(d) list, provided a discussion of the 303(d) listing process and its limitations, and provided related recommendations (Stevens et al., 2001).

USU's evaluation of water quality data in WRIA 1 showed that, in general, the upper portions of the drainage typically had excellent water quality with some impairment observed in the lower, more developed portions of the drainage (Stevens et al., 2001). This does not mean water quality concerns were not identified in upper portions of the drainage, as illustrated in Table 2.2. This table provides additional details on water quality concerns and potential causes for each of the eight areas evaluated by USU.

A review of the existing 303(d) listed waterbodies at the time the Phase II report was drafted showed 274 individual 303(d) listings. Many of these listings (42) are in Bellingham Bay (Inner)/Whatcom Waterway. Kamm Slough, Silver Creek, Double Ditch/Pepin Creek, and Johnson Creek each have 15 or more listings, Fishtrap Creek has 11, and the remaining have less than ten each. Figure 2.26 provides an example of how the 303(d) information is displayed in the Phase II report for each of the eight areas – tributaries to the mainstem of the Nooksack River are used as the example.

The most frequently listed water quality parameter, by a large margin, is fecal coliform, accounting for 82 listings. Dissolved oxygen is next at 48. Temperature, pH, and ammonium-nitrogen account for 26, 15, and 12 listings, respectively, while all other parameters have less than five. The 303(d) listings for these pollutants are primarily in the fresh water portions of WRIA 1, with the exception of Drayton Harbor, Bellingham Bay and Hale Passage, which are also listed for fecal coliform bacteria. Polycyclic aromatic hydrocarbons, other organic contaminants, and heavy metals make up most of the remainder of the water quality parameters for listed waterbodies (Stevens et al., 2001)

Table 2.2: Water quality concerns and potential causes for eight geographic areas in WRIA 1 (Adapted from table in Stevens et al., 2001)

Water Quality Concern	Cause
South Fork Nooksack	
<ul style="list-style-type: none"> • Temperature and fisheries habitat (streambed siltation) problems numerous • Fecal coliform, dissolved oxygen (D.O.) Black Slough • D.O. Caron Creek • Nutrients slightly elevated in lower channel • Turbidity and suspended solids somewhat elevated in tributaries subject to forest practices 	Agriculture and forestry resulting in: <ul style="list-style-type: none"> • Sparse riparian vegetation in some areas and where present riparian forest are mainly deciduous and young • Large amounts of diking and drainage in the lower portion • Erosion from forest roads, clear cuts; temperature elevation due to clearcuts • D.O, fecal impairments in Caron and Black Slough due to reduced backwater storage and reduced ground water recharge during low flow periods; also animals near waterways, precip, suspension/deposition of bacteria in streambeds, septic systems
Middle Fork Nooksack	
<ul style="list-style-type: none"> • Temperature and D.O. (some 303(d) listings) don't appear to have sufficient information, • Canyon/Porter/Clearwater Creeks should potentially be listed 	<ul style="list-style-type: none"> • Elevated temperature not clear - may be due to City of Bellingham diversion, lack of vegetative cover, increased water surface area, lower stream depths due to widening channels, or channel modifications due to debris flows • Removal or alteration of riparian vegetation • Timber harvesting
North Fork Nooksack	
<ul style="list-style-type: none"> • Temperature (a number of stream segments are listed based on inconclusive information. Potential listings Racehorse, Boulder, Canyon, Cornell, Gallop, Maple and Kendall Creeks • Low D.O. has been observed in may of the tributaries during the summer • Two 303(d) listings for fine sediment 	<ul style="list-style-type: none"> • Sediment due to timber harvesting and/or other forest practices • Temperature not clear – lack of vegetative cover, increased water surface area, lower stream depths due to widening channels, or channel modifications due to debris flows • Potential for urban and agricultural impacts in lower basin
Mainstem Nooksack and Portage Bay	
<ul style="list-style-type: none"> • Fecal coliform principal concern • Elevated nutrients and sediments 	Fecal coliform and nutrient loading due to drainages impacted by agriculture and dairies.
Mainstem Nooksack Tributaries	
Temperature, D.O., turbidity, pH, ammonia nitrogen, fecal coliform (very few recent data for nutrients, suspended solids, turbidity)	Fecal coliform, D.O., and pH from dairies specifically in Fishtrap/Bertrand Creek area
Lake Whatcom Watershed	
Oxygen demanding material	Urbanization
Drayton Harbor Watershed	
Fecal coliform	Agricultural runoff most likely source of biochemical oxygen demanding material, fecal coliform, and nutrients to Dakota and California Creek.
Sumas River Watershed	
D.O., fecal coliform, pH	Agricultural runoff most likely source of biochemical oxygen demanding material, fecal coliform, and nutrients

These pollutants, or contaminants, are primarily present in Bellingham Bay (inner) Whatcom Waterways, and Strait of Georgia¹⁹. Figure 2.27 provides a summary of the number of stream segments listed for a given parameter.

¹⁹ These names refer to specific geographic areas that have been defined by the Washington State Department of Ecology.

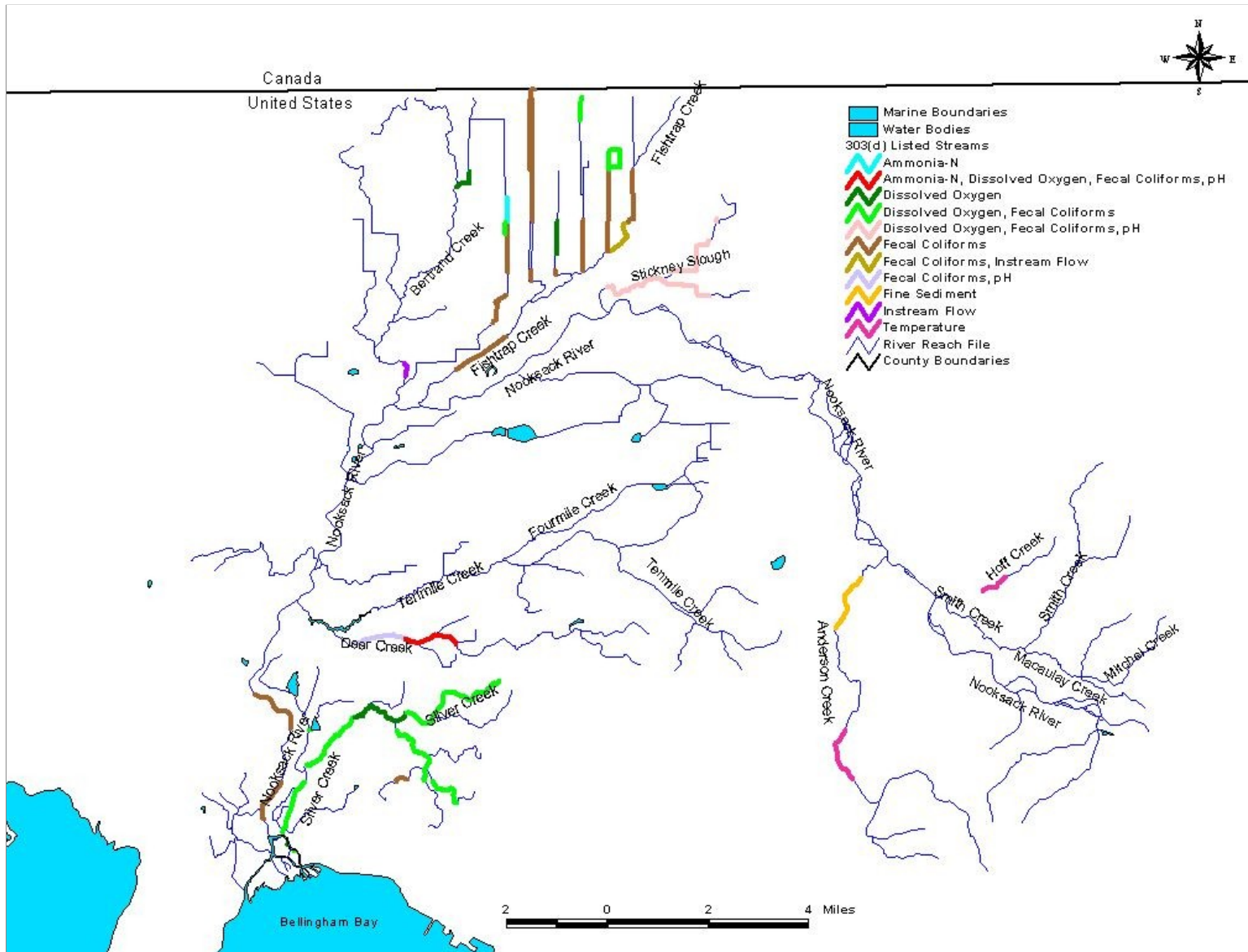


Figure 2.26: 303(d) listed stream segments in the tributaries to the mainstem of the Nooksack River (Stevens et al., 2001)

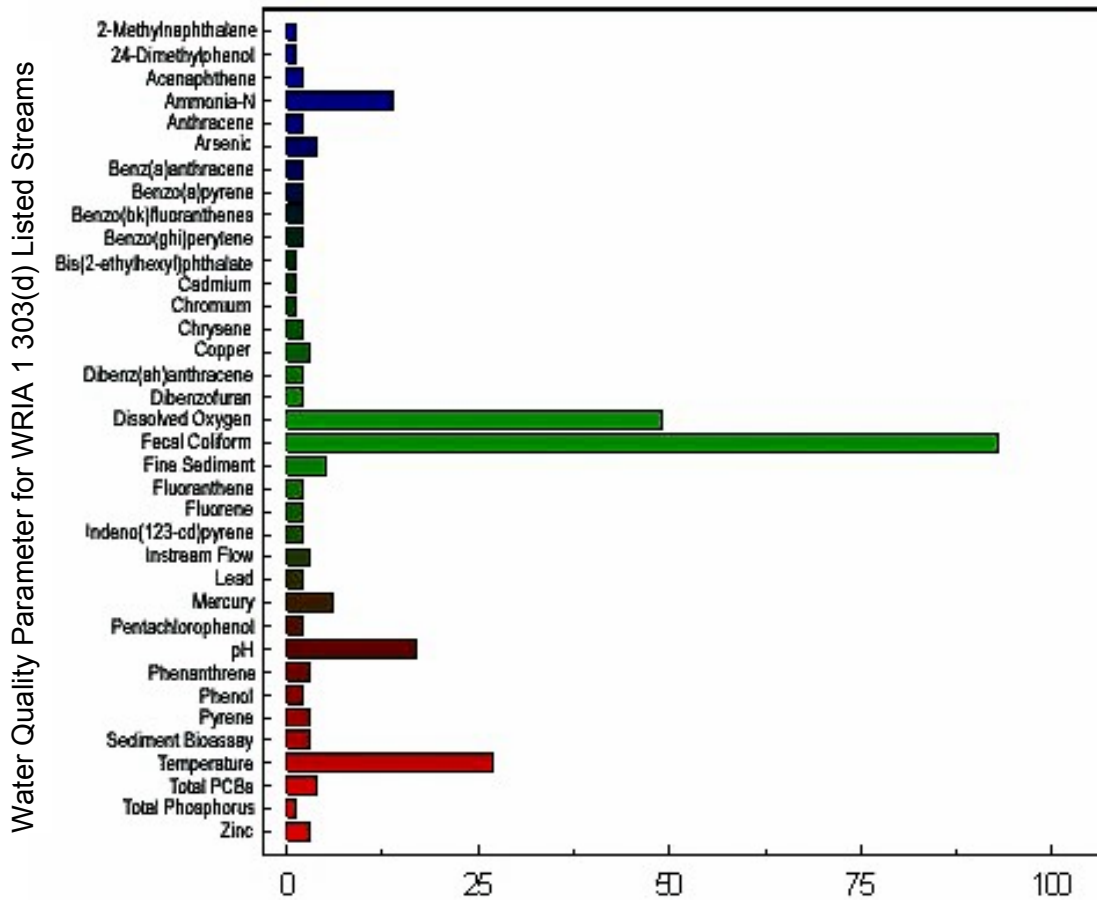


Figure 2.27: Number of stream segments listed for a given parameter in WRIA 1. (Stevens et al., 2001)

An evaluation by USU of the water quality data that were the basis for the listing of many of the waterbodies to the 303(d) list showed that, in most cases, the listing for the water quality parameter identified was supported by the data (Stevens et al., 2001). However, the USU report identifies some of the challenges, limitations, and ways in which the 303(d) listing process could be improved.

The biggest overall concern identified by USU is the lack of consistency in the 303(d) listings throughout WRIA 1. Justifications used for listing some waterbodies may be overlooked in other waterbodies. For example, many questions that arise deal with the number of measurements necessary to determine impairment, the frequency with which each constituent should be measured in order to determine impairment, and the number of years of data that need to be collected in order to determine an accurate estimate of a constituent in a waterbody. Because there is no national guidance from EPA on this subject, states are required to determine their own water quality standards and 303(d) listing requirements. Even though the State of Washington's listing guidance is somewhat vague with regard to certain issues and situations, the interpretation of the guidance must be consistent across the WRIA and the state. There is a need for a collaborative monitoring effort in WRIA 1 that will provide the consistent and long-term monitoring strategies required to support the 303(d) listing process. Representative data sets are necessary to implement consistent interpretations of 303(d) listing guidance (Stevens et al., 2001).

The Washington State Department of Ecology listing requirements are described in Water Quality Program Policy 1-11. This policy was updated in 2002 and the revisions addressed some but not all of the concerns identified by USU.

- Data Gaps

USU conducted a data coverage and analyses evaluation to determine the spatial and temporal extent of existing water quality data in the WRIA. The primary goals of the analyses were to determine if data needs would be met for future water quality modeling and assessment in Phase III, and to identify specific data gaps that could be filled by either short- or long-term monitoring (Hardy et al., 2002). The evaluation of existing data showed that although large amounts of data exist in the mainstem of the Nooksack, tributary sampling has been less intensive. In addition, most data have been collected as part of targeted studies, with data to establish long-term trends in water quality available only at a small number of stations. Preliminary recommendations for future data collection were provided.

Upon completion of the Phase II efforts, WRIA 1 participants and USU scientists focused efforts on identifying and constructing the mathematical models and computer interface to further define and address water quality problems identified during Phase II and to support planned and potential TMDL work by Ecology. The constructed computer models will help decision-makers evaluate the impact of various management actions on water quality and assist decision-makers in evaluating trade-offs between options. Modeling recommendations were made for two main geographic areas: Lake Whatcom and the remainder of WRIA 1 (excluding the Fraser River system). The model recommendations and associated data needs were developed as an “Early Data Need” and are described in more detail below:

- Lake Whatcom – Lake Whatcom is the source of drinking water for approximately half of all Whatcom County residents. Over the years, some members of the community have raised concerns about the lake water quality due to multiple uses (e.g., homes, recreation, transportation) of the watershed surrounding the Lake and the potential for those uses to adversely affect water quality. In order to better understand the influence of existing and potential future land use actions and management activities in the Lake Whatcom watershed on water quality and water quantity, USU is constructing what are termed “loading” and “lake response” models. The models will focus on key water quality indicators - temperature, dissolved oxygen, nutrients, algae, and zooplankton. These models and the associated monitoring program are described in a report titled, *EDN 8 – Information Needs for Lake Whatcom Model and its Incorporation into the WRIA 1 WMA Decision Support System* (Stevens, Horsburgh, and Neilson, 2003). Refer to Section 3 of this document for additional information on Lake Whatcom and how the WRIA 1 models will be integrated into the existing Lake Whatcom Management Program.
- Surface Water Quality for WRIA 1 (excluding Lake Whatcom) – Key water quality concerns identified in Phase II were temperature, nutrients and fecal coliform. To address those concerns, computer models are being developed to

help evaluate the water quality impacts associated with various land use and management actions. The models and associated data needs are described in two reports 1) *EDN 13: Review and Summary of Surface Water Quality Modeling Approaches* (Stevens, Horsburgh, and Neilson, 2003) and 2) *Monitoring Support for Surface Water Quality Modeling*. (Stevens, Horsburgh, and Neilson, 2003) A summary of the areas and objectives for each computer model is provided in Table 2.3.

Table 2.3: Areas and objectives for WRIA 1 water quality models (excluding Lake Whatcom and Fraser Drainage).

Model Area	Objective
WRIA-Wide	Coarse resolution modeling (both spatial and temporal) of temperature, dissolved oxygen, nutrients, and fecal coliform bacteria on a monthly to seasonal time scale with output at most of the WRIA 1 drainage outlets.
Dakota Creek	Coarse temporal resolution modeling of temperature, dissolved oxygen, nutrients, and fecal coliform bacteria on a monthly to seasonal time scale similar to the coarse resolution model, but with increased spatial resolution (output is provided at sub WRIA 1 drainage outlets).
South Fork Nooksack ¹	High resolution modeling of water temperature in the South Fork of the Nooksack River including the ability to examine daily fluctuations in water temperatures.
Fishtrap Creek ¹	High resolution modeling of temperature, dissolved oxygen, nutrients, and fecal coliform bacteria.

¹The South Fork Nooksack and Fishtrap Creek high resolution models have been deferred.

As with the Lake Whatcom model, the modeled parameters for the other WRIA 1 surface water quality models do not include all the parameters of concern to WRIA 1 participants. In particular, sediment and pesticide modeling were discussed, but due to the limitations in the available data, the complexity of the associated modeling, and limited resources, were not pursued further at this time.

The Early Data Need tasks for water quality focused on developing the scope of work for Phase III modeling efforts and included identifying and selecting the appropriate surface water quality models. Completing model selection under the EDN effort enabled USU to focus the Phase III technical work on: 1) collecting and analyzing data for model calibration and validation, and updating the water quality database, 2) constructing the models and preparing associated documentation (excluding the high resolution South Fork and Fishtrap Creek models that were deferred during revisions to the Phase III Scope of Work due to resource constraints), and 3) integrating the models into the DSS. Independent peer review of the surface water quality models will occur at the beta stage of model development. The USU Phase III technical work is scheduled for completion in late 2005.

Ground Water Quality

The USU Phase II technical assessment work related to ground water quality focused on: 1) developing a comprehensive ground water quality database; 2) assessing historical trends and current status of nitrogen and pesticides in WRIA 1 ground water; and 3) providing recommendations related to future modeling, data adequacy and gaps, and potential future concerns related to existing land use activities.

USU investigators developed and used a ground water database to evaluate nitrogen and pesticide conditions in WRIA 1. In conducting the assessments, USU divided the WRIA into 20 aggregated drainages (Figure 2.28). These drainages were selected to be consistent with those used in the "Summary Characterization for Water Resource Inventory Area #1" written by PUD and Whatcom County staff. The results of the USU Phase II work are provided in a report titled "Nitrogen and Pesticide Contamination of Ground Water in Water Resource Inventory Area 1" along with the associated database.

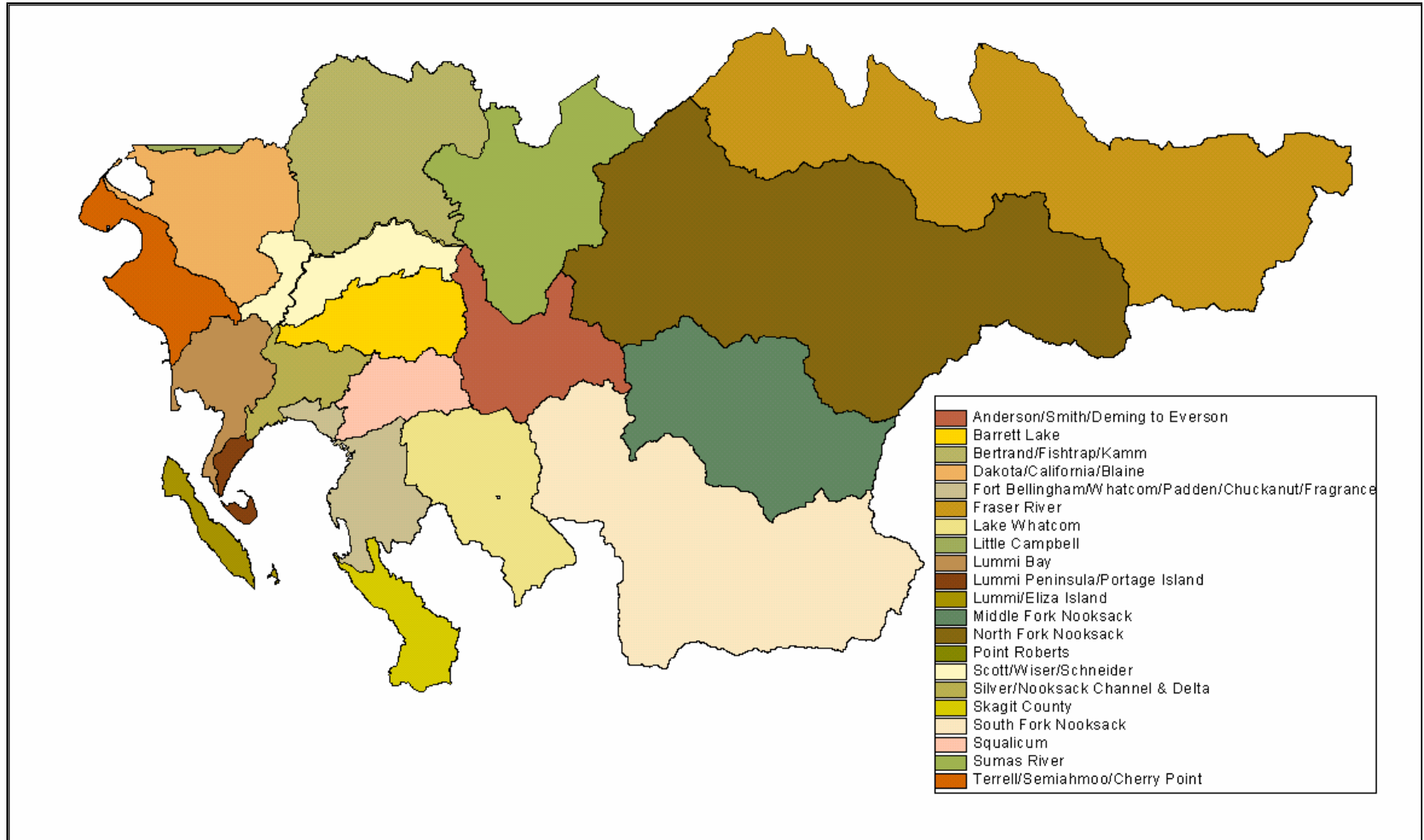


Figure 2.28: Aggregated surface water areas of WRIA 1 used in the USU analysis to define the regional ground water quality. (Kaluarachchi, Kra, Twarakavi, and Almasri, 2002)

Nitrogen and pesticides were selected for the Phase II work because ground water is the source of drinking water for many people in WRIA 1 and previous work conducted by other entities identified these as pollutants of concern. In addition, limited resources precluded the examination of all potential water quality concerns and pollutants during Phase II.

Comprehensive Database

As their first task, USU created a comprehensive electronic ground water database that compiled the databases from the Washington Department of Ecology, Washington State Department of Health, Whatcom County Health Department, and the US Geological Survey. This resulted in a database with 3,831 ground water wells contributing 9,842 measurements of nitrate concentration from 1990 to 2000. On a yearly basis, the number of wells with nitrate concentration data ranged from 214 to 747, contributing 494 to 1,322 data points annually.

Current Status and Historic Trends in Nitrogen and Pesticides

In order to assess the anthropogenic effects on ground water quality, USU analyzed the nitrate data by classifying the water quality measurements into four concentration ranges:

- 0 - .99 mg/l most likely natural background conditions
- 1-2.99 mg/l indicates possible human influence
- 3-9.99 mg/l concentrations due to human influence, and
- ≥ 10 mg/l exceeds the drinking water standard maximum contaminant level

The highest percentage of wells in any subbasin exceeding the maximum contaminant level (MCL) of nitrate at least once during 1990 to 2000 was 35.8% (Kaluvarachchi et al., 2002). This observation was recorded in the Bertrand/Fishtrap/Kamm aggregated area, which straddles the US-Canadian border. The annual mean nitrate concentration in this area has been rising steadily since 1990. The maximum nitrate concentration recorded in

the early 1990s was from the Barrett Lake aggregated area with a value of 260 mg/L. In the latter part of the 1990s, the Bertrand Creek area recorded concentrations as high as 39 mg/L in 1999 and 20 mg/L in 2000. The Sumas River area recorded nitrate concentrations as high as 26 mg/L in 1998. Figure 2.29 shows the numbers of years between 1990 and 2000 that each area of WRIA 1 exceeded a given concentration range of nitrate. The results show that ten areas exceeded the drinking water MCL standard (10 mg/L), in at least one year. Four areas exceeded the MCL in at least eight years.

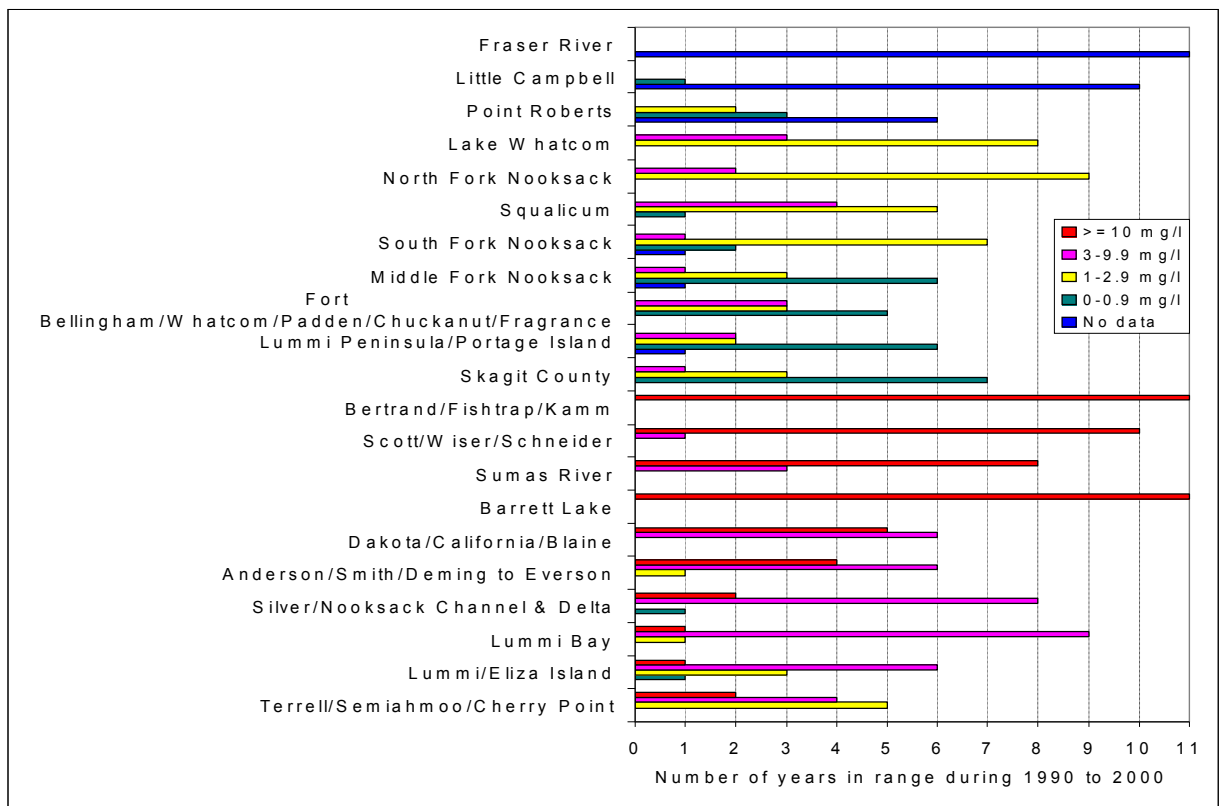


Figure 2.29: Number of years that the annual mean concentration of nitrate in a given aggregated drainage was between identified ranges, from 1990 to 2000. (Kaluarachchi et al., 2002)

In general, the annual maximum, mean, and median nitrate + nitrite concentrations have been increasing in several other areas in the northern part of WRIA 1. The results indicate that the percentage of sampled wells with high nitrate concentration increased with time. This observation, together with other results, resulted in USU investigators’ assessment that nitrate is a concern in ground water and will remain a concern due to

shallow ground water depths, heavy agricultural activities, and high permeability of the aquifer.

Pesticide Contamination

Previous studies by different entities have reported pesticides as major contaminants in the ground water of WRIA 1 (Hardy et al., 2002). An examination of data in the USU database indicates some reduction of pesticide concentrations in certain parts of WRIA 1. However, there is a continuing concern of pesticide contamination in some subbasins of WRIA 1. A careful look at the existing data shows that these data have been collected from areas with heavy agricultural activity and known prior contamination. Therefore, the available data are not necessarily representative of ground water quality across WRIA 1.

Analysis of existing data of 12 pesticides indicated that three pesticides previously banned from public use, ethylene dibromide (EDB) and 1,2-dichloropropane (1,2-DCP), are a concern in the Fishtrap, Bertrand, Schneider, Kamm, Scott, and Johnson subbasins. Although the annual maximum concentration of EDB decreased across WRIA 1, the concentration of EDB in the Bertrand Creek subbasin was as high as 0.186 ppb in 1999, as compared to the MCL of 0.05 ppb. The behavior of 1,2-DCP was similar and the concentrations were as high as 11 to 19 ppb in the Bertrand Creek and Fishtrap Creek subbasins in 1997, as opposed to the MCL of 5 ppb. Table 2.4 shows the annual maximum concentrations of EDB and 1,2-DCP in various sub-basins.

Due to the high permeability of the Sumas aquifer, a shallow water table, and resistance of pesticides to degradation in soil and ground water, USU states that pesticide transport by advection and dispersion with some natural attenuation is a possibility in the affected subbasins. Advection and dispersion refers to the transport and corresponding dilution of the pesticides as the ground water carries the contaminants through the aquifer. During transport, the amount of pesticide contamination, over time, is reduced by natural processes that occur within the aquifer. On the other hand, the high concentrations remaining after nearly 15 years after the ban can also suggest that local

Table 2.4: Annual Maximum Concentration of EDB and 1,2-DCP Exceeding the Respective MCLs (Hardy et al., 2002)

Year	Sub-Watershed	Maximum EDB Concentration (ppb) MCL=0.05 ppb	Maximum 1,2-DCP Concentration (ppb) MCL = 5 ppb
1984	Bertrand Creek	2.31	
	Fishtrap Creek	1.25	
	Scott	0.72	
1986	Bertrand Creek	6.10	
1987	Bertrand Creek	3.56	
	Kamm	0.09	
1988	Bertrand Creek	3.87	24
	Kamm	0.35	
	Johnson	0.54	
	South Dakota	-	14
1989	Bertrand Creek	5.76	20
	South Dakota	-	8.8
1990	Bertrand Creek	1.38	5.6
	Kamm	0.17	
1991	Bertrand Creek	2.40	
1992	Bertrand Creek	2.32	
1993	Bertrand Creek	2.86	
	Kamm	0.28	
1994	Bertrand Creek	2.39	
	Kamm	0.06	
	Johnson	0.50	
1997	Bertrand Creek	-	19.4
	Fishtrap Creek	-	11.4
1998	Bertrand Creek	0.68	
	Schneider	0.07	
1999	Schneider	0.19	

application sites have residual pesticides that are undergoing slow natural attenuation without much transport. Although both of these possibilities are viable in these subbasins, the available data are not adequate, in terms of monitoring frequency and spatial distribution of monitoring locations, to allow for a rigorous analysis of the two possibilities.

USU concludes in their Phase II report that in any event, the threat to ground water quality due to pesticides remains a concern, especially for agricultural areas of WRIA 1. Due to the low to moderate runoff characteristics, high permeability, and a shallow water table in the major agricultural areas, ground water is vulnerable to pesticide contamination. Therefore, the existing pesticide contamination will remain a major concern in the future as well.

Recommendations

Based on the findings from the Phase II study of nitrogen and pesticides, USU provided four key recommendations: 1) implement a long-term field monitoring program across WRIA 1 in order to gather a consistent set of long-term ground water quality data from spatially distributed locations representing both heavily contaminated areas and other areas of WRIA 1 with minimal potential for contamination; 2) gather information on natural attenuation and sorption characteristics of pesticides through soil sampling at selected locations of affected sub-watersheds; 3) develop a nitrate fate and transport model in order to assess the effectiveness of various management alternatives on nitrate concentrations in ground water; and 4) re-assess ground water quality after a set of consistent long-term ground water quality data is available.

USU investigators and WRIA 1 Project participants used the results of the Phase II assessments to develop the Phase III Scope of Work. When initially adopted in early 2002, the Phase III ground water quality work focused on:

1. Developing a nitrate fate and transport model for the extended Sumas-Blaine aquifer (Figure 2.30), which would help decision-makers evaluate the effect of various land uses and management practices on nitrates;
2. Understanding the reliability and limitations of the model through work on model calibration/validation, and sensitivity/uncertainty analysis; and
3. Using the existing ground water database to evaluate the historic trends and current status of heavy metals in ground water to determine if there are significant water quality concerns associated with them.

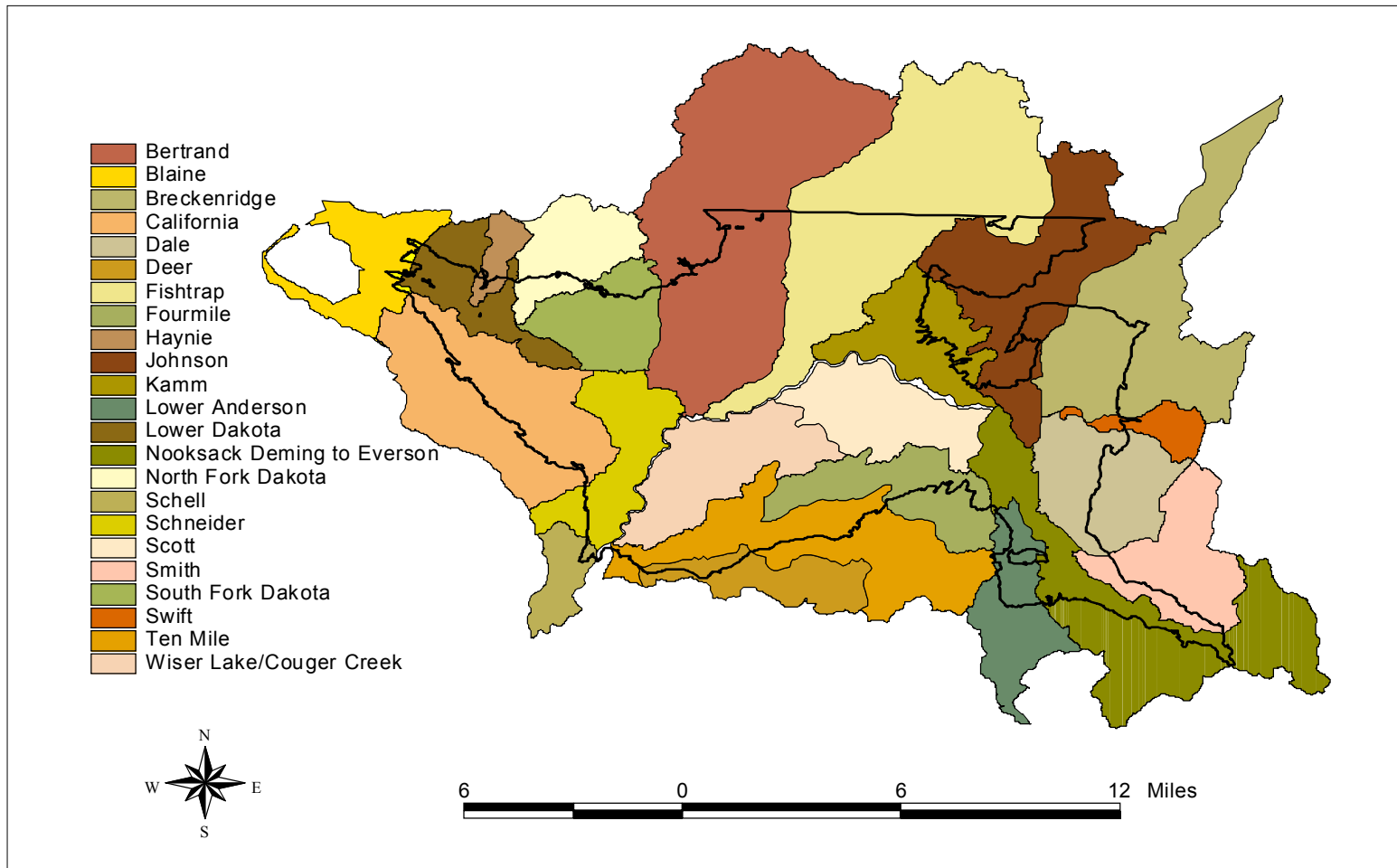


Figure 2.30: Delineation of the Sumas-Blaine aquifer in the U.S. portion of WRIA 1 in relation to the corresponding surface water drainages overlapping the aquifer. (Kaluarachchi et al., 2002)

USU has provided the WRIA 1 Water Quality Technical Team with initial drafts of the report, *Conceptual Model of Fate and Transport of Nitrate in the Extended Sumas-Blaine Aquifer, Whatcom County, Washington*, which describes the conceptual model of a nitrate fate and transport model recommended by USU. An outcome of the Phase III checkpoint discussions was a reduction in the scope of the ground water quality tasks with some actions deferred to a future date due to resource limitations. The USU Phase III tasks now focus on:

- Completing the nitrate fate and transport model as a stand-alone executable model using a single layer ground water quantity model. This means that it will not be possible to assess the impacts of water quantity changes (e.g., well pumping rates) on water quality until the model is integrated with the DSS along with a multi-layer ground water quantity model.
- Packaging the work completed to date relative to the heavy metals analysis and submitting it to WRIA 1 participants. The work is approximately 75% complete.

The schedule for completing the revised Phase III tasks is December 2005.

Next Steps

The water quality actions that remain to be completed include:

- Complete the revised USU Phase III Scope of Work tasks;
- Complete items that were deferred in the original Phase III Scope of Work including:
 - Constructing the high resolution South Fork temperature model and Fishtrap model and integrating them into the DSS; and
 - Integrating the nitrate fate and transport model into the DSS, including updating the model as necessary to use the multi-layer ground water quantity model when it is completed;

- Determine the level of work necessary to complete the Heavy Metals report (75% complete) and determine, if appropriate, steps for completing;
- Develop and implement a ground water quality monitoring program building on the initial recommendations provided by USU;
- Refine the surface water quality monitoring program (refer to Section 4); and
- Schedule and complete technology transfer and training for the Water Quality component of the DSS. Joint Board funding has been set aside for this task.

2.3.1.5 Instream Flow

The overarching instream flow goal stated in the March 2000 WRIA 1 Scope of Work is:

The goal of the instream flow component is to supply water in sufficient quantities to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve fish habitats on which fish rely.

The Initiating Governments agreed that, to meet the above goal, instream flow needs would be examined as part of the WRIA 1 Project and that an analysis would be conducted to estimate optimal instream flows for fisheries resources in the WRIA throughout the year (WRIA 1 Watershed Management Project, 2000).

An essential step in achieving this goal is to develop the technical information necessary to evaluate instream and out of stream needs. The overall objective of this element of the WRIA 1 Project is to provide accurate estimates of the relationship between stream flow and fish habitat quantity and quality for different fish species and life stages throughout WRIA 1. This technical information, along with the information gained through the water quality and water quantity elements of the WRIA 1 Project, will

be used to help evaluate instream flow needs. The water quantity element of the project will also develop the technical information needed to help evaluate out of stream needs.

USU in collaboration with WRIA 1 Project participants is proceeding with an instream flow analysis for a number of reasons including:

- To apply best available science and to enable knowledge-based decision-making in WRIA 1;
- The inextricable linkage between instream flow needs and an evaluation of water quantity and water quality.
- An effort to respond to the listing of certain fish species under the Endangered Species Act; and
- Resolution of water availability issues including addressing tribal water right claims and helping to determine the amount of water available for in- and out-of-stream uses.

Method/Results

The overall approach used to implement the instream flow element of the WRIA 1 Project was to: 1) convene a team of local technical experts and generalists to work with a national and international group of experts, 2) reach consensus on the methods to be used in the analysis, 3) apply the selected methods, and 4) summarize the results of the technical analyses in a form that is useful for decision-makers.

USU completed a majority of the instream flow work in coordination with WRIA 1 Project participants and in particular the Instream Flow Technical Team and the Fish Habitat Technical Team. The first action that was taken was to hold an instream flow methods conference, followed by Phase I scoping, Phase II technical assessment work, Early Data Needs, and Phase III technical assessment work. Actions and results associated with each of these activities are described below.

Instream Flow Methods Conference

The Instream Flow Methods Conference was conducted during September 15-17, 1999. The purpose of the conference was to evaluate the numerous scientific methodologies available for estimating “instream flow requirements.” Based on the evaluation, methodologies were to be selected for developing accurate relationships between stream flow and fish habitat quantity and quality throughout WRIA 1. A panel of 12 experts from the public and private sector judged to represent a broad cross-section of perspectives on the best way to estimate these relationships participated in the conference. The conference participants identified what are needed instream flow levels and addressed five main topic areas: stratification, hydrology methods, methods for field data collection, fish habitat modeling, and fish habitat suitability criteria/indices.

Key findings of the conference, which USU documented in a peer-reviewed conference report (Hardy, 2000), include:

- Agreement by the technical experts that, rather than a single flow level, an ecological flow regime comprised of five functional categories was essential for maintaining the ecological health of the stream system. The five categories are: 1) water quality maintenance, 2) fisheries baseflow, 3) channel maintenance, 4) riparian maintenance, and 5) valley maintenance. Figure 2.31 is a hypothetical representation of the ecological flow regime.

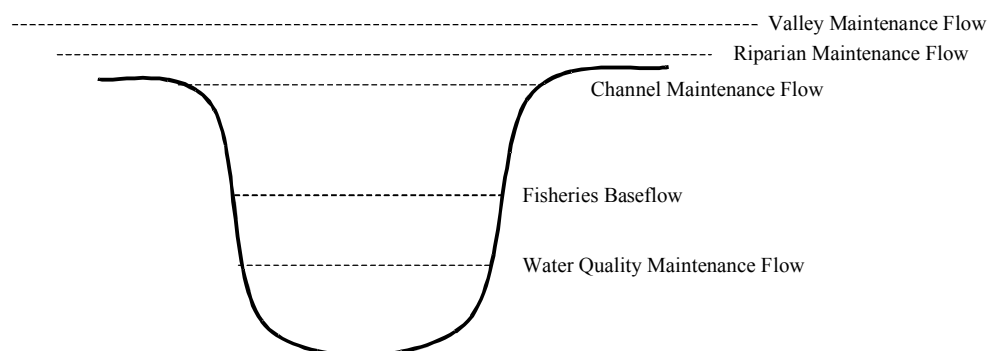


Figure 2.31: Hypothetical illustration of the flow components essential for maintaining the ecological health of the stream system.

- If there were no budget or time constraints, appropriate field data needed to quantify ecologically based flow regimes of stream segments could be collected at all points of interest throughout WRIA 1. Pragmatically, the cost and time associated with field data collection and analysis efforts prohibits such an approach in the short-term. To balance cost and time constraints with the needed level of accuracy, the technical experts agreed that some form of basin stratification and extrapolation would be required.
- Hydrologic relations can be used to estimate the five components of an ecological flow regime and are often used to develop interim estimates of the fisheries baseflow component. The interim fish habitat flow estimates are then refined using more complex methods as time and budget allow. In WRIA 1, because Washington State Department of Ecology estimated instream flow needs for fish habitat in 1986 as part of the Instream Resource Protection Program for several areas within WRIA 1, the panel of experts agreed that there is no need to develop or identify interim instream flow needs. The experts agreed that the focus should be on conducting technical assessments that conceptually parallel the Instream Flow Incremental Methodology (IFIM) approach within each stratum identified in a basin stratification effort to evaluate the instream flow needs.
- The experts noted that there are a wide variety of stream types to be sampled in the study area and that the most appropriate field data collection methods depend on the stream type and the approach used to estimate the ecological flow regime. Identified stream types in the study area include estuaries, well-confined (single) mainstem channel, multi-channel (braided) mainstem channel, low gradient single and multi-channel tributaries, and small high gradient streams. Field data collection efforts should generally include:
 - Mapping fish habitat and channel form;
 - Identifying when and which life stages of various species occur (periodicity);

- Channel cross-section geometry;
 - Channel longitudinal geometry;
 - Channel substrate and cover;
 - Flow velocity and depth;
 - Water quality (e.g., temperature, dissolved oxygen, sediment, nutrients, metals);
 - Benthic invertebrates.
- The Physical Habitat Simulation (PHABSIM) element of the Instream Flow Incremental Methodology (IFIM) and two-dimensional hydraulic modeling were identified as the best available physical habitat computer modeling approaches.
 - The experts unanimously recommended that a Habitat Suitability Indices (HSIs)/Habitat Suitability Criteria (HSC) workshop be convened to develop interim HSC curves for the study area and to identify the process that will be used to develop and test the interim curves.

The workshop is described in a report titled, *A Conceptual Framework and Technical Approach for Assessing Instream [Ecological] Flow Needs in the Water Resources Inventory Area No. 1* (Hardy, 2000). The results of the workshop were used in the Phase I scoping process to identify the Phase II technical assessment activities.

Phase I efforts defined recommended field collection strategies and analysis approaches based on best available science. This is summarized in the detailed scoping document: “*A Conceptual Framework and Technical Approach for Assessing Instream Flow Needs in the Water Resources Inventory Area No. 1 (WRIA 1) in Washington State*” (Hardy, 2000). The field collection efforts followed the guidelines outlined in that document.

Field collection efforts at the intensive sites included collecting information on water quality, and biological/site characteristics. Examples of the types of water quality and site characteristic information collected are provided in Table 2.5. The specific field methodologies are outlined in Hardy, 2000. The evaluation of FY 2000 field efforts and

Table 2.5: Water quality and site characteristics measured at intensive sites

Water Quality	Site Characteristics
<ul style="list-style-type: none"> • Discharge and water surface elevations • Water temperature (continuous recording thermographs) • Dissolved oxygen • Specific conductance • pH • Salinity • Alkalinity (CaCO₃) • Ammonia (NH₃) • Nitrate (NO₃) • Phosphorous (PO₄) • Turbidity • Benthic macroinvertebrates • Macroinvertebrates (drift samples) 	<ul style="list-style-type: none"> • Channel morphology • Substrate characteristics • Vegetation cover • Large woody debris • Riparian vegetation elevation and distribution • Discharge and water surface elevations • Velocity distributions • Reach level mesohabitat mapping

associated recommendations are provided in the USU Phase II technical report *Technical Evaluation of FY 2000 Field Season*.

As noted in the field assessment report, the initial site on the Middle Fork of the Nooksack River was determined to be logistically infeasible to obtain quality data after repeated attempts. Therefore, this site was dropped from further field efforts during FY 2000. A new site was located downstream during the spring of 2001.

Phase II/Early Data Needs Activities

Phase II activities focused on (Hardy et al., 2002):

- Completing a Habitat Suitability Criteria (HSC) report to identify species and life stage periodicity within WRIA 1 and the associated HSC to be used in subsequent habitat based analyses.
- Data collection at 13 intensive study sites identified during scoping activities for the USU Phase II Scope of Work.
- Completing a technical based assessment of the FY 2000 field data collection and making recommendations for field collection strategies during FY 2001.
- Completing a preliminary watershed stratification to assist in the selection of FY 2001 field sampling sites in terms of instream flow and fish habitat assessments.

Habitat Suitability Criteria

Habitat Suitability Criteria (HSC) is used in the habitat models for estimating the relationship between stream flow and available fish habitat. The integration of the hydraulic modeling element of PHABSIM (which is based on collected field data on channel structure and hydraulics) with the habitat modeling element of PHABSIM (which is based on field data and a literature review) to estimate the relationship between stream flow and available fish habitat is depicted diagrammatically in Figure 2.32.

The primary goal of this activity was to reach agreement on the most appropriate HSC and the periodicity for the various life stages of fish species of concern in WRIA 1 based on existing information. A secondary goal was to identify data needed to validate the adopted HSC specific to the WRIA 1 Project study area for the life stages and species of concern.

To accomplish these goals, a workshop with fisheries biologists and other experts was held during October 11-12, 2000. The first objectives of the HSC Workshop were to evaluate existing HSC that may be suitable for use in the WRIA 1 instream flow and fish habitat assessments and to outline a strategy for evaluating selected HSC and the subsequent validation of habitat modeling efforts. In addition, because evaluation of instream flow needs require the specification of fish species distribution and life stage

Data Collection

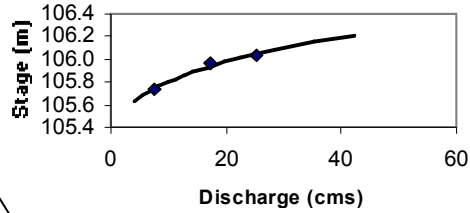
Data Analysis

Computer Modeling

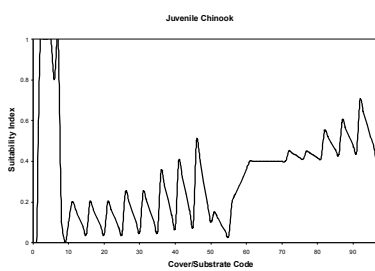
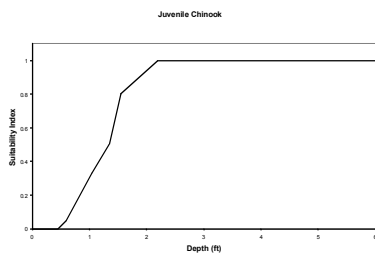
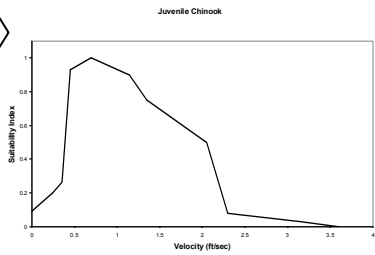
Decision Support Information

Hydraulic Data and
Channel Structure Representation
(i.e., Computational Mesh)

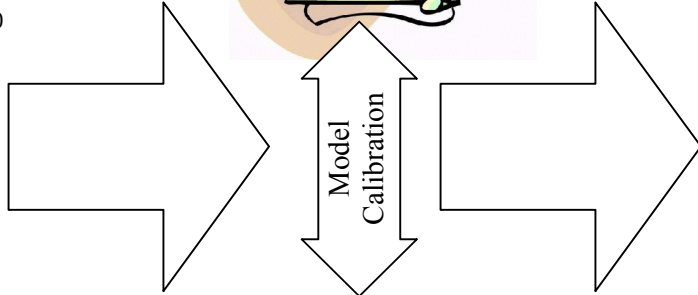
Stage-Discharge Relation



Habitat Suitability Criteria



Method Selection
Site Selection
Field Data
Collection
Literature Review



Model
Calibration

Utah State
University
Scientists

WRIA 1 Instream Flow
and Fish Habitat
Technical Teams

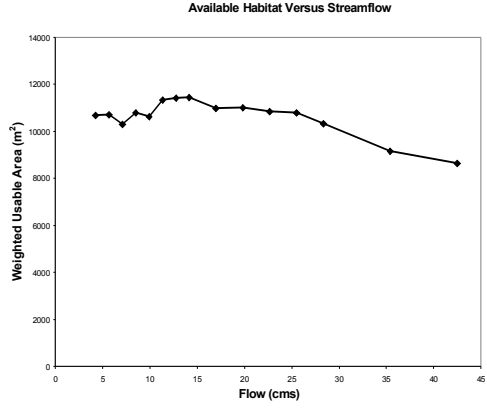
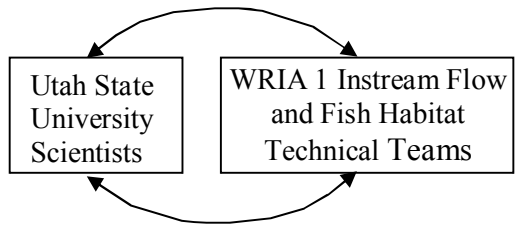


Figure 2.32: Overview of technical steps of the WRIA 1 Watershed Management Project instream flow element

periodicities on a monthly basis, the Instream Flow and Fish Habitat Technical Teams developed draft preliminary species and life stage periodicities for the Nooksack River Basin. The final objective of the October 2000 workshop was to evaluate this preliminary draft species and life stage periodicities for species and life stage comprehensiveness and appropriate monthly periodicity.

Prior to the workshop, Utah State University (USU) provided a library of potential HSC for depth, velocity, and substrate/cover for resident salmonid and anadromous species, background material on HSC nomenclature, and HSC development and testing protocols. The Washington Department of Fish and Wildlife provided their current Instream Flow Study Guidelines as well as several HSC for anadromous and salmonid species in use in Washington. The Instream Flow and Fish Habitat Technical Teams distributed their draft preliminary species and life stage periodicities information. The results of the HSC workshop are summarized in a conference report (Hardy 2002, HSC Report).

Field Data Collection

As part of the USU Phase II technical work, the methodologies identified during the 1999 Instream Flow Methods Conference were applied to sites in WRIA 1 as part of the 2000 data collection effort. The sites where USU applied this methodology are referred to as “intensive sites” due to the amount of data collection and analysis associated with each site. Following the 2000 field season, a less intensive approach was also used so that data could be collected and analyzed at more sites for the available budget. Sites where this alternative methodology was applied are referred to as “rapid assessment sites.”

During the 2000 field season, USU collected data at 13 “intensive sites.” During the 2001 field season, they collected data at nine “intensive sites” and five “rapid assessment sites.” Table 2.6 provides a listing of the study sites. In addition, more detailed site-specific maps are contained in the USU Phase II technical report *Technical Evaluation of FY 2000 Field Season* (Hardy, 2002, Stratification Report).

Table 2:6: Instream Flow Study Sites in WRIA 1 (2000 – 2001)

Study Site	Site Characteristics		
	Site Type ^a	Overlap Site ^b	Measured Flow Range ^c
Whatcom Creek	Intensive	No	15.21 cfs - 133.62 cfs
Bertrand Creek	Intensive	Yes	4.21 cfs to 19.59 cfs
Fishtrap Creek	Intensive	Yes	7.17 cfs to 44.79 cfs
Tenmile Creek	Intensive	Yes	7.89 cfs to 41.54 cfs
Anderson Creek	Intensive	Yes	1.3 cfs to 11.74 cfs
Dakota Creek	Intensive	Yes	0.25 cfs to 0.46 cfs
South Fork Nooksack	Intensive	Yes	375 cfs to 899 cfs
Middle Fork Nooksack	Intensive	Yes	~315 cfs to 814 cfs
North Fork Nooksack	Intensive	Yes	~326 cfs to 2,051 cfs
Mainstem near Confluence	Intensive	Yes	1,320 cfs to 6,050 cfs
Mainstem near Everson	Intensive	No	~2,600 cfs to ~4,100 cfs
Mainstem near Lynden	Intensive	No	~2,500 cfs to ~4,000 cfs
Mainstem near Ferndale	Intensive	Yes	2,340 cfs to 3,040 cfs
Mainstem at Estuary	Intensive	No	~1,900 cfs to ~3,300 cfs
Lower South Fork Nooksack	Intensive	No	339 cfs to ~2,300 cfs
Kendall Creek	Intensive	Yes	Upper Site: 0.35 cfs to 34.13 cfs Lower Site: 0.24 cfs to 39.36 cfs
Hutchinson Creek	Intensive	Yes	12.5 cfs to 82.1 cfs
Maple Creek	Intensive	Yes	8.8 cfs to 45.49 cfs
Austin/Beaver Creeks	Intensive	No	2.14 cfs to 20.11 cfs
Squalicum Creek	Intensive	No	0.394 cfs to 55.27 cfs
Johnson Creek	Intensive (Unknown) ^d	Yes	2.9cfs
Black Slough	Intensive	No	0.865 cfs to 40.42 cfs
Racehorse Creek	Rapid Assessment	Yes	3.20 cfs
Cornell (California ^e) Creek	Rapid Assessment	Yes	2.42 cfs
Kamm Creek	Rapid Assessment	No	1.10 cfs
Haynie Creek	Rapid Assessment	No	0.15 cfs
Breckenridge Creek	Rapid Assessment	No	.56 cfs

^a Methodology applied at “Intensive” sites described in Hardy (2000); Field methodology applied at “Rapid Assessment” sites described in USU SOW for DOE ISF Grant 2003.

^b “Overlap” means at or near a location where the Department of Ecology established minimum instream flow levels as part of the Instream Resources Protection Program (IRPP) in 1986 (Ecology 1986).

^c The flow ranges used in the computer modeling effort are above and below the measured flows. For the rapid assessment methodology, only one flow and the hydraulic characteristics of the stream channel are measured and used to apply the methodology.

^d Land Access to Johnson Creek was initially granted by the ‘renters’ and subsequently denied by the owners. Alternative modeling of this site is being investigated based on the limited field data.

^e Cornell Creek was sampled instead of California Creek due to logistics and site characteristics.

The Instream Flow and Fish Habitat Technical Teams' members worked with Utah State University to identify the selected sites. As part of this effort, a number of factors were considered including:

- Representativeness of the stream reach (to increase the reliability of extrapolated results);
- Availability of fish utilization data (to validate the model results);
- Management issues (to ensure that empirical data and models were collected at locations where there are existing or anticipated conflicts over water use); and
- Location of instream flow quantification sites from the previous study conducted by the Washington State Department of Ecology (to allow comparison of new relationships with existing flow levels).

Figure 2.33 provides an example of the visual representation obtained from the field-based characterizations at a small stream study site obtained during the Phase II work. USU investigators will use the information to develop and calibrate two-dimensional hydraulic simulation models for each intensive study reach that will be integrated with the HSC for specific species and life stages. This will then be used by USU during the Phase III technical work to develop and subsequently validate habitat modeling at each site.

Technical Evaluation of 2000 Field Study and Phase III Site Selection

As part of the USU Phase II Scope of Work, the FY 2000 field collection efforts were evaluated from a technical perspective of recommended procedures described in Hardy (2000) and actual field experiences. The USU Phase II report *Technical Evaluation of FY 2000 Field Studies* (Hardy, 2002) describes the outcomes of this evaluation. The report highlights specific field experiences for each type of data collection effort and makes specific recommendations on modification to field techniques based on the experiences.

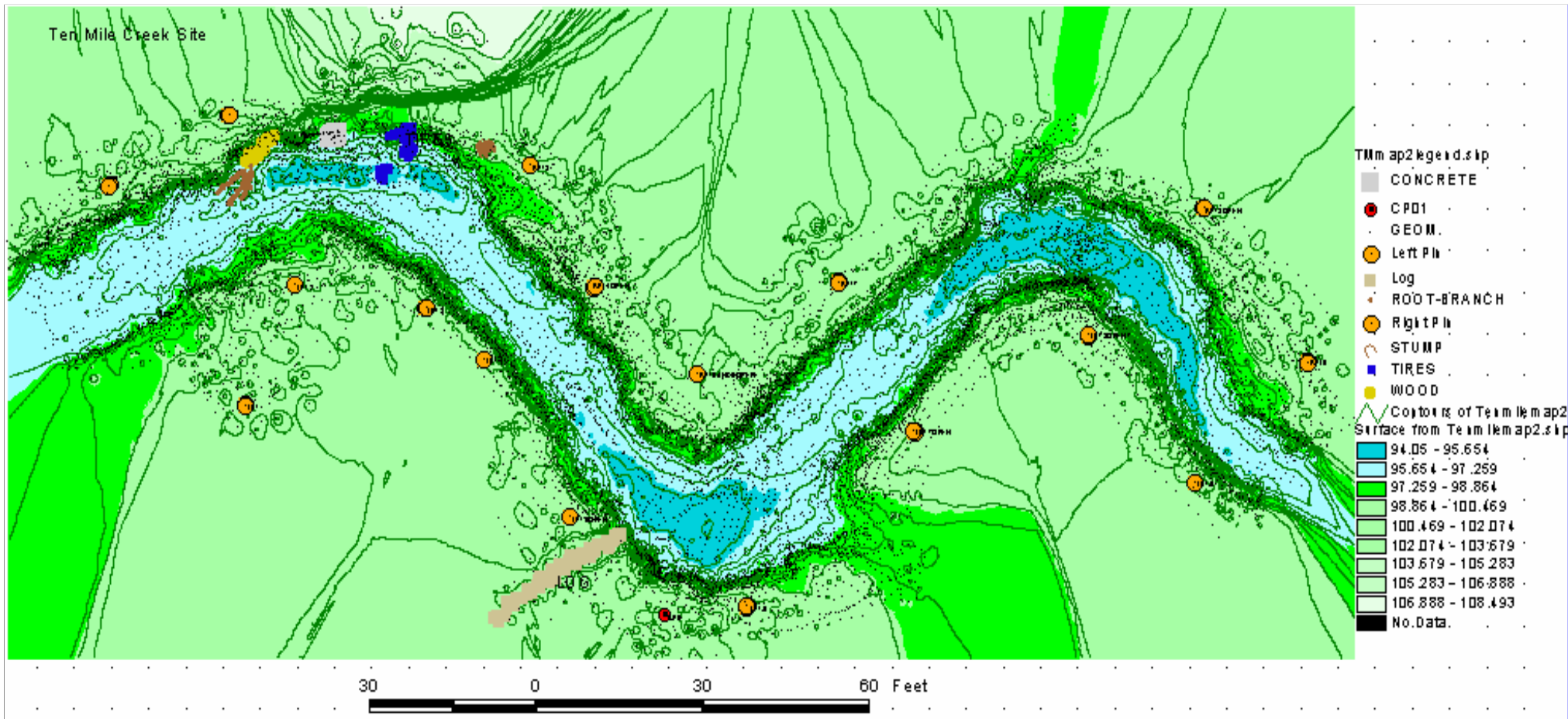


Figure 2.33: Example of field based physical characterization at an intensive study site (Hardy et al., 2002)

Over all, the recommended methods outlined in Hardy (2000) and applied during the FY 2000 field season worked well. Specific recommendations were primarily oriented toward streamlining data collection efforts.

Preliminary Watershed Stratification

The objective of the preliminary watershed stratification effort was to group drainages into homogeneous areas where stream systems have similar hydrologic, geomorphic, and biological characteristics as outlined in Hardy (2000). The purpose of the stratification was to assist in the selection of study sites during the Phase II 2001 field season and to obtain representative instream flow assessment data throughout WRIA 1. In addition to the hydrologic, geomorphic, and biological characteristics, other factors such as existing stream flow depletions, known water quality and temperature issues, and potential for future water allocation issues were considered in the stratification and selection of potential FY 2001 study sites. This was accomplished through a review of ‘physical based’ stratification results by both the Instream Flow and Fish Habitat Technical Teams and discussions from the technical assessment of FY 2000 field collection efforts. The results of the preliminary basin stratification are included in the USU Phase II technical report *WRIA 1 Preliminary Watershed Stratification Summary Report* (Hardy, 2002).

It is important to note that the intent of the preliminary basin stratification was to assist in selection of FY 2001 study sites. The stratification will be updated and refined as additional information and supporting analyses in surface and ground water quantity and quality become available during USU Phase III technical work.

The preliminary stratification procedure relied upon estimated hydrology derived from Phase II technical analyses undertaken by the surface water quantity team. The mean monthly hydrographs for each drainage within the WRIA 1 were used as the basis to compute a ‘bimodal-intensity index’ to pre-sort drainages by their underlying characteristic hydrograph. This is illustrated in Figure 2.34. The results of the pre-sorted

drainages used in subsequent clustering of self-similar drainages based on a wide array geomorphic and land use characteristics are shown in Figure 2.35.

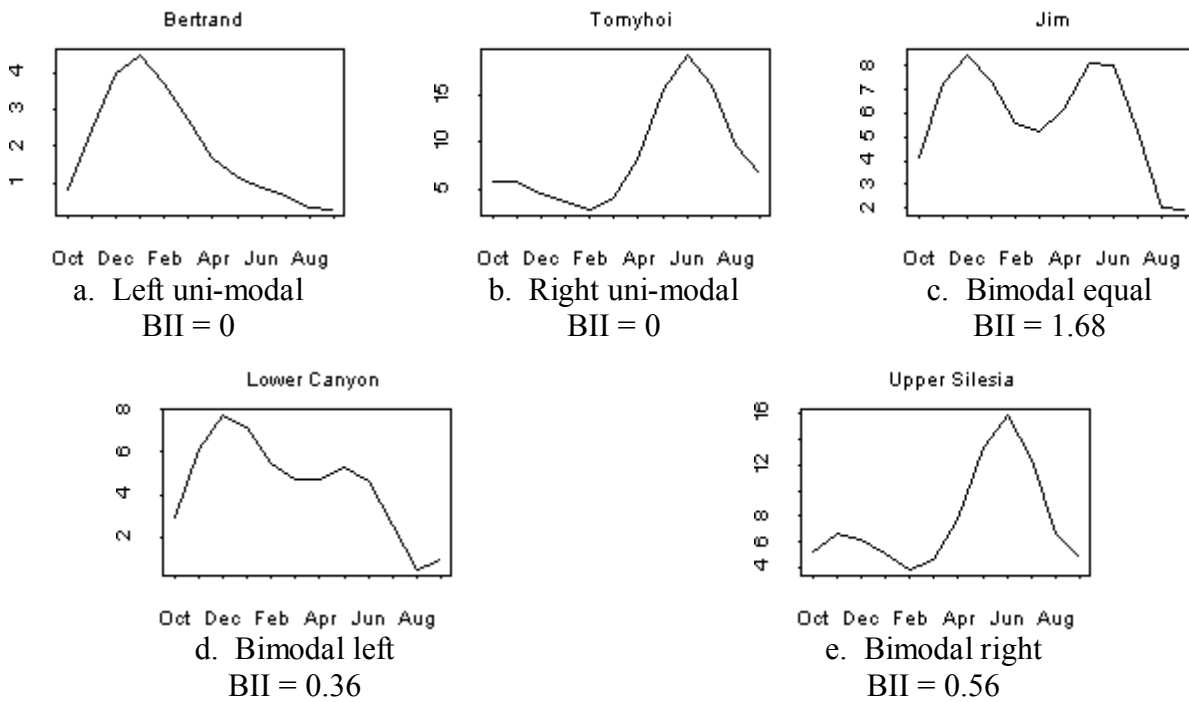


Figure 2.34: Relationship between bimodal-intensity index and hydrograph shape characteristics used for pre-stratification partitioning of drainages (Hardy et al., 2002)

Phase III Technical Work

The adopted USU Phase III work focused on eight activities including:

- Data reduction, hydraulic and habitat model calibration, and model validation;
- Habitat utilization validation data collection;
- Updated basin stratification for instream flow assessments;
- Comparative analysis of WDOE instream flow requirements;

- Development of estimated ecological flow regimes;
- Development and validation of instream flow extrapolation methodology;
- Instream flow selection methodology workshop;
- Invertebrate sample processing; and
- Integration of instream flow model results and fish habitat data into the decision support system.

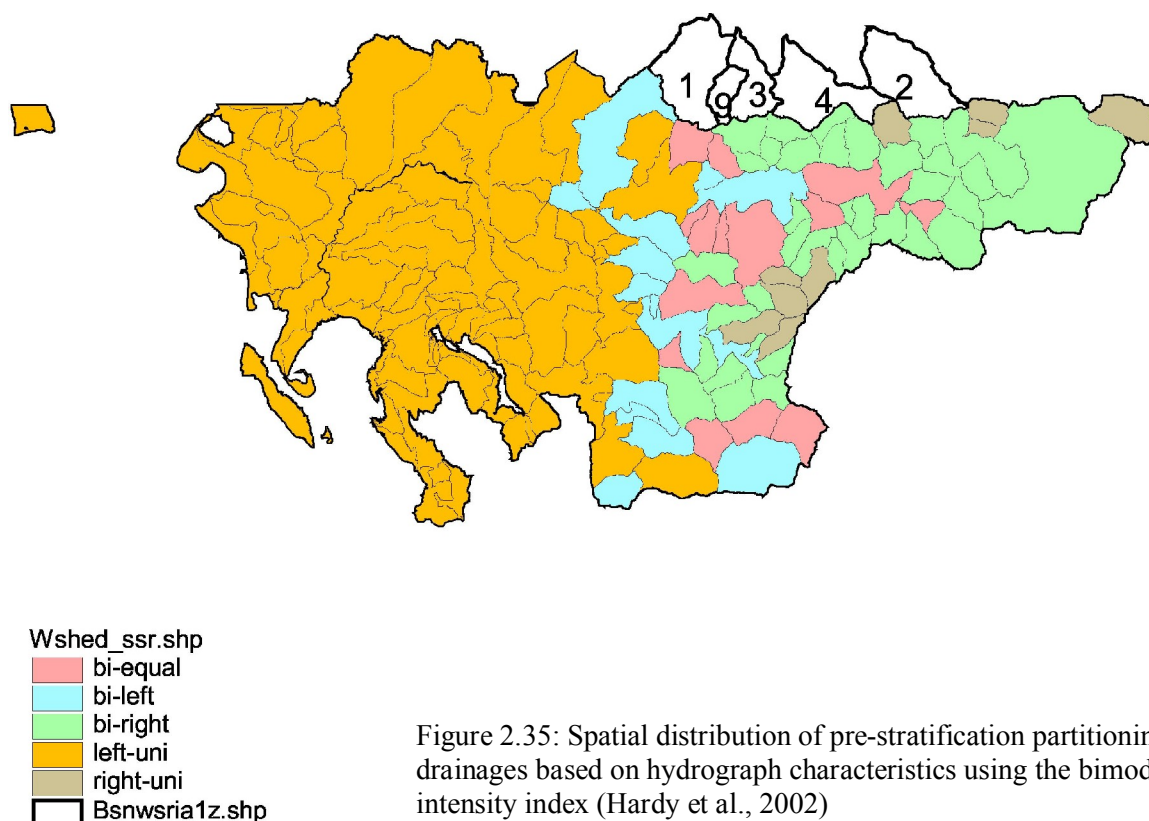


Figure 2.35: Spatial distribution of pre-stratification partitioning of drainages based on hydrograph characteristics using the bimodal-intensity index (Hardy et al., 2002)

With the exception of the Instream Flow Extrapolation Workshop and Instream Flow Methodology Symposium, which have been completed, the results of the remaining USU’s Phase III technical work will be available in 2004 as work is completed. The results of the workshop and symposium are outlined below:

Instream Flow Extrapolation Workshop

The Instream Flow Extrapolation Workshop was held in Bellingham on April 2, 2002. The purpose of the workshop was to investigate how instream flow modeling results from the 22 intensive study sites could be used to reliably identify an ecological flow regime at other locations throughout WRIA 1. Three main categories of extrapolation methods were discussed:

1. **Mass Balance Method:** The Mass Balance Method involves scaling the stream flow based on watershed area and assumes that all variables are equally distributed over the drainage such as: precipitation, elevation, slope, land use, and geology. The disadvantage of this approach is that it does not identify whether the extrapolated site is a stream 5 feet wide or 50 feet wide. It was generally agreed that with some site-specific information this method could be used. The Washington Department of Fish and Wildlife (WDFW) Toe-Width method, which has been tested in court, provides some site-specific information, and has been used to set flows for a specific control point.
2. **Flow Volume Ratio Method:** The Flow Volume Ratio Method involves stratifying stream reaches based on relationships such as hydrologic characteristics or fish distributions. The ratio between Mean Annual Flow (MAF) and the estimated Instream Flow Need (IFN) at an intensive site is determined and then applied to the extrapolated site where the MAF has been estimated or measured.
3. **Geomorphic-Based Linkage Method:** The Geomorphic-Based Linkage Method stratifies drainages based on a series of hydrologic, hydraulic, and geomorphic features. This method has been studied in Canada in Alberta and the South Saskatchewan River Basin. There are two basic approaches associated with this method. One approach requires less field information and essentially involves establishing a regression relation between key factors (e.g., precipitation, drainage area) and the IFN determined for an intensive site. The regression relationship is then used to estimate an IFN at an extrapolated site. The second approach involves establishing a regression relationship between drainage characteristics and hydraulic

parameters of an intensive site. This regression relationship is then used to estimate the hydraulic parameters of an extrapolation site. The extrapolated hydraulic parameters are then combined with the habitat suitability curves to estimate the IFN at the site.

It is apparent that selected instream flow regimes based on extrapolation must be flexible. These flows will be used for regulation of new water rights and for restoration projects. If the flows were set on extrapolated methods, it may be up to the water developer to test the accuracy and appropriateness of the set flow regimes. Extrapolation of instream flows is relatively new ground for watershed management. As part of the Phase III work to be conducted by USU, the validation of the extrapolation methodology will be tested based on the collection of rapid assessment data in 14 additional stream reaches throughout WRIA 1 during 2003 and 2004. The field data collection and subsequent analyses for hydraulic and habitat conditions at these 14 validation sites was completed by the end of March 2004.

Instream Flow Selection Methodology Symposium

The Instream Flow Selection Methodology Symposium was held in Bellingham May 29-30, 2002. The purpose of the Symposium was to identify how instream flow modeling results can be used as a management tool to identify and protect an ecological flow regime throughout WRIA 1 in the context of the multiple demands of out-of-stream water users and federal, state, and tribal laws. The Symposium presentations, which included question and answer periods, were followed by a roundtable discussion of the panelists in an effort to integrate the technical, legal, and policy elements of a selection methodology. The symposium presentations are summarized in a written report titled *Instream Flow Selection Methodology Symposium – Summary Report* (Hardy, 2002).

Following the Instream Flow Selection Methodology Symposium and distribution of the Symposium report, two actions were taken relative to continued development of the WRIA 1 instream flow efforts. These actions included:

- The formation of an intergovernmental Instream Flow Working Group with authorization by the WRIA 1 Joint Board and Planning Unit for the Working Group to draft an Instream Flow Selection and Adoption Action Plan for their consideration. The most recent version of this plan is presented in Appendix C.
- Securing a Washington State Department of Ecology grant to conduct fieldwork during 2003 that would supplement the USU Phase III work and that will help validate the instream flow extrapolation methodology. The fieldwork was completed and the results are being incorporated into the analysis of various extrapolation methods.

Next Steps

There are several actions remaining to be completed related to instream flows. They are:

- Complete the revised Phase III Scope of Work;
- Develop and implement a long-term instream flow monitoring plan (refer to Section 3);
- Implement the Instream Flow Selection and Adoption Action Plan that will be approved as part of the WRIA 1 Watershed Management Plan - Phase 1; and
- Conduct training on the Instream Flow component of the DSS.

2.3.1.6 Fish Habitat

The overarching goal stated in the WRIA 1 Project March 2000 Scope of Work for fish habitat is:

To protect or enhance fish habitat in the management area and to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve habitats on which fish rely.

To meet this goal, the technical assessment requirements specified in the March 2000 Scope of Work are to coordinate with WRIA 1 salmon recovery efforts in three general areas:

- Populations - Develop information that summarizes current and historic fish habitat and populations;
- Fish Habitat Needs - Evaluate physical, biological, and chemical processes in terms of good fish habitat; and
- Limiting Factors - Evaluate factors limiting current finfish and shellfish populations throughout WRIA 1.

The purpose of the fish habitat section of the WRIA 1 Phase 1 Watershed Management Plan is to describe the approach used to coordinate fish habitat work already underway in the basin with the WRIA 1 Project, and to summarize information on populations, fish habitat needs, and limiting factors. It is noted that there are a number of actions underway to address fish habitat issues that are being conducted outside the WRIA 1 Project. It is not within the scope of this section of the Watershed Management Plan to describe all of these actions. The WRIA 1 Project, however, supports and enhances many of the other salmon recovery efforts through both the technical assessment work described in this section (e.g., water quantity, water quality, instream flow), and activities associated with some of the management recommendations discussed in section 3 (refer to the Instream Flow Action Plan, Pilot Programs, and WRIA-Wide Programs). In addition, a long-term strategy for how to enhance coordination between the WRIA 1 Project and Salmon Recovery is provided in Section 4 Governance and Implementation Strategy.

Fish habitat and salmon recovery efforts in WRIA 1 are being led by the Salmon Co-Managers. The emphasis of the fish habitat component of the WRIA 1 Project has been on coordination and supplementing the work of the Co-Managers

Methods/Results

The approach used to enhance coordination of efforts between the WRIA 1 Project and other salmon recovery programs was to create a WRIA 1 Fish Habitat Technical

Team. The Fish Habitat Technical Team (TT), as with other technical teams, was open to membership from the Planning Unit caucuses and the initiating governments. The Fish Habitat TT largely functioned in a joint capacity with the Instream Flow TT given the integrated nature of the topics and technical work.

The primary functions of the Fish Habitat TT were to assist project consultants access existing fish habitat data and reports; provide local technical expertise on fish habitat conditions and functions, populations, periodicity, and spatial distributions; and, to coordinate the flow of information between the watershed management project and salmon recovery efforts in WRIA 1. These latter functions included assessments and actions by the salmon co-managers and others, projects developed through the Lead Entity under Engrossed Substitute House Bill 2496, access to restoration project data compiled by the members of the Nooksack Recovery Team, and information such as limiting factors analysis being used to develop the WRIA 1 Salmonid Recovery Plan.

The Fish Habitat TT assisted USU investigators with access to and compilation of the existing fish habitat data for WRIA 1. Fish (salmonid) distribution maps generated for the Washington Conservation Commission's limiting factors report (Smith, 2002) project were updated with current information by local experts and made available to USU. Anchor Environmental, under contract with the City of Bellingham, prepared a report (Anchor Environmental, 2003) describing salmonid periodicity (timing of the various salmonid lifestages in the freshwater system). The TT also prepared a report describing important temperature and dissolved oxygen thresholds for fish life to be used in evaluating both water quality and instream flow-modeling results. Finally, new fish habitat data were collected at each of the intensive and rapid assessment instream flow sites analyzed under this project. These sites were selected to be representative of the range of both stream and fish habitat types within WRIA 1 and form the basis for extrapolation of instream flow habitat results from a measured and modeled site to one that has similar habitat, geomorphology, hydrology, and fish use, yet is unmeasured. This is more fully explained under the instream flow section.

The remainder of this section will be used to summarize information related to fish populations, habitat needs, and limiting factors. The majority of this information comes from efforts independent of the WRIA 1 Project and includes the above referenced limiting factors report (Smith, 2002), chinook habitat modeling results using the Ecosystem Diagnosis and Treatment model (WDFW, NNR, LN in preparation), chinook recovery planning targets (Shared Strategy, 2002), and the fish habitat assessments referenced in the text below.

Populations

WRIA 1 supports runs of anadromous salmon and trout including early and late river entry chinook, coho, chum, odd year pink salmon, and smaller numbers of even year pink salmon, riverine (Nooksack) and lake-type (Chilliwack) sockeye, summer and winter steelhead, bull trout, and coastal cutthroat trout. Additional non-anadromous life history strategies of indigenous species include fluvial bull trout, adfluvial bull trout, resident Dolly Varden char, kokanee, resident cutthroat trout, and resident rainbow trout. Native non-salmonids in WRIA 1 include green and white sturgeon, Pacific lamprey, river lamprey, western brook lamprey, mountain whitefish, longfin smelt, longnose dace, Nooksack dace, longnose sucker, largescale sucker, Salish sucker, shiner perch, and starry flounder. Introduced species include Eastern brook trout, brown trout, largemouth and smallmouth bass, black crappie, bluegill, pumpkinseed, yellow perch, brown bull head, channel catfish, and yellow bullhead (Anchor Environmental 2003). While generalized life histories are discussed below, see Anchor Environmental (2003) for more complete species periodicity information and for more information on resident fish of WRIA 1.

Chinook in the Puget Sound Evolutionarily Significant Unit (ESU) are listed as a threatened species under the Federal Endangered Species Act (ESA). This ESU includes all naturally spawning chinook populations in the Puget Sound Region from the North Fork Nooksack River to the Elwha River, including the independent drainages to Strait of Georgia (64 FR 14308, Mar. 24, 1999). The North/Middle Fork Nooksack early chinook population and South Fork early chinook population have been determined by

Washington Department of Fish and Wildlife (WDFW) to comprise two of only five genetic diversity units in Puget Sound (Marshall et al., 1994). National Marine Fisheries Service (NMFS) considers both populations essential for recovery of the Puget Sound ESU (64 FR 14308, Mar. 24, 1999). While all naturally spawning populations of chinook are considered threatened, late spawning chinook in WRIA 1 are not presently identified as an independent population.

Bull trout in WRIA 1 are also listed as a threatened species under the ESA by the U.S. Fish and Wildlife Service (USFWS). Bull trout in WRIA 1 constitute a component of the Coastal-Puget Sound Distinct Population Segment (DPS) (64 FR 58910, Nov. 1, 1999). WRIA 1 bull trout comprise two of eight core areas that have preliminarily been defined within the Puget Sound Recovery Unit: Nooksack and Chilliwack.

Puget Sound/Strait of Georgia coho salmon, including Nooksack coho, is considered a candidate for possible listing by NMFS (64 FR 33466, Jun. 23, 1999). Pacific lamprey are considered a species of concern by USFWS, and Nooksack dace and Salish sucker are listed as endangered in Canada (Anchor Environmental, 2003).

Fish Habitat Needs

- Rearing Habitat

The fish of WRIA 1 exhibit a variety of life history strategies, with some species having more life history diversity than others. Consequently, changes in water quantity and quality affect the various species differently depending on their life history patterns and timings and their distributions within the watershed. For example, juvenile pink salmon fry and some chum salmon fry out-migrate to estuaries soon after emerging from spawning gravels, while other chum rear in freshwater for weeks or up to about a month. Juvenile chinook have more diverse out-migration strategies, moving to estuaries as fry soon after emergence, as fingerlings in spring or summer after rearing for weeks to months in fresh water, or as yearlings. Freshwater rearing is comparatively less important for the pink, chum, and chinook fry out-migrants, for which estuarine rearing

then becomes more important (although many pink juveniles also have short estuarine residencies).

Recent NOAA Fisheries analysis, with fisheries co-manager input, of scales collected from natural origin adults from the North, Middle, and South Fork early chinook populations indicate that during the years when at least 40 samples were analyzed, 34% and 36% respectively of adults had out-migrated as yearlings, with the rest leaving as sub-yearlings (fingerlings or fry). Genetic analysis of smolt trap juvenile out-migrants also shows that Nooksack fall chinook can also out-migrate as yearlings.

Freshwater rearing is obviously very important for resident fish. It is also very important for the anadromous salmon and trout with long freshwater juvenile rearing residencies including some chinook (1 year), all bull trout (generally 2 years), coho (primarily 1 year, occasionally 2 years), steelhead (1-4 years), cutthroat (1-4 years), and river-type sockeye (1 year). While the respective anadromous species juvenile distributions and habitat preferences vary, those with extended freshwater rearing periods must survive through one or more summer low flow/ high temperature periods as well as winter high discharge periods. If the juveniles are in areas that have water quantity and water quality problems during these times, they can be directly impacted.

Additionally, substantial seasonal movements into different habitat types characterize many species that rear for a year or more in freshwater. For example, coho juveniles generally redistribute for winter rearing into floodplain habitats including side-channels, beaver ponds, and other wetland areas. Not only is the quantity of this habitat important, the surface connectivity of it to other water bodies is critical to enable the juveniles to make these seasonal movements between habitat types.

High water temperatures reduce juvenile salmon and trout growth rates. Since marine survival rates generally have a positively correlation with size at out-migration, reduced freshwater growth rates from elevated water temperatures may reduce overall survival to adulthood. High water temperatures are associated with low dissolved oxygen levels and can also increase susceptibility to diseases, and can lead to competitive displacement by

warmer water species. In extreme cases, high temperatures result in direct mortality of juveniles. The physiologic process of smolting is a sensitive period for juveniles as changes occur to enable survival in marine conditions, and fish are sensitive to high temperatures and suspended sediment levels during this transitional phase.

Since salmon and trout are sight feeders, elevated suspended sediment levels can affect their ability to feed, and even create barriers to habitat use due to avoidance of turbid waters by juveniles. Elevated suspended sediment levels can also reduce primary productivity (benthic algae and related organisms), which can in turn reduce macroinvertebrate populations (aquatic insects which serve as food for juveniles). Additionally, elevated fine sediment levels (primarily sand sized and smaller particles) can fill interstitial spaces between cobbles, which are important winter juvenile refuge areas during cold temperature periods. Interstitial spaces between cobbles are also important for macroinvertebrates and the loss of these spaces can reduce juvenile salmon and trout food sources.

- Upstream Migration and Holding

The timing and duration of adult river entry, upstream migration, and pre-spawn holding for the anadromous salmon and trout species vary tremendously. Because of this, some species are more exposed to additional stresses if water quantity and water quality are impaired than others. For example, early chinook, summer-run steelhead, adult and sub-adult bull trout, sockeye, pink salmon, and some sea-run cutthroat and coho return from salt water during spring or summer months. These fish may then encounter low flows, high temperatures, or low dissolved oxygen (or a combination of these) that can impede adult (and sub-adult bull trout and cutthroat) upstream migration and holding. Later timed river entry adults such as winter run steelhead, fall chinook, and chum are less likely to be affected because they typically migrate during months with cooler temperatures and higher discharge.

Early upstream migrating adults (early chinook, summer-run steelhead, and bull trout) also tend to have longer pre-spawn holding periods than later timed stocks. These

extended holding periods correspond with summer months that can have low discharge, high temperatures, and low dissolved oxygen levels. Not only are these species migrating and holding during the period of highest water quality and water quantity concern, they are doing so for extended periods (months). Therefore, these adults can be more exposed to poaching or predation, and are more susceptible to disease if temperatures are warm, which can occur during the summer low discharge, higher temperature period. Thermal barriers to upstream migration occur with high temperatures, and ripe females exposed to high temperatures can have increased pre-spawn adult mortality and reduced egg survival to the eyed egg stage. Low dissolved oxygen can also result in barriers to adult migration. The early migrating runs (especially early chinook, summer-run steelhead, and bull trout) also tend to migrate to reaches located higher (farther upstream) in the watersheds.

Bull trout migrate a great deal throughout their life history stages, and anadromous bull trout and some anadromous cutthroat trout are unique in having sub-adult, sexually immature, fish return to freshwater to forage and over-winter in accessible habitats that can be far removed from their natal streams. Then they out-migrate again to near shore areas for a few months the following late winter or spring, prior to re-entering freshwater to migrate to their natal spawning streams as mature adults. While bull trout, steelhead, and cutthroat can make repeated migrations between fresh and salt water and spawn more than once, the salmon all die after spawning. Bull trout are the most temperature sensitive anadromous salmonid. Maintaining adequate instream flows and cool water temperatures in their migration and foraging corridors in mainstems and other lowland waters is very important, even though their spawning areas are generally located in waters with a minimum elevation of about 500 feet above sea level.

Adult distributions of all migratory (anadromous, fluvial, and adfluvial) salmon and trout species are affected by water quantity, and water quality and the quantity of available habitat is highly dependent on adequate instream flows. While the various species and lifestages have preferences for depths, velocities, substrates, and cover, adult migrations prior to spawning also require adequate instream flow to reach spawning

areas. This is particularly important for use of tributaries and side-channels, where the availability of habitat is highly dependent on adequate instream flows to retain physical connections between the habitat types. During years when inadequate migration and/or spawning flows occur, spawning distributions are geographically more limited. This may have consequence for spawning success in that the redds may be concentrated in what at low flow were the only suitable or accessible habitats and at high flows (such as the October 2003 floods) may be the portions of the channel that are more susceptible to redd loss due to streambed scour. Even later spawning species including fall chinook and coho have annual spawning distributions that vary, depending on the instream flows available for migration prior to spawning.

In reaches subject to deposition of coarse sediment such as alluvial fans, spawning in and upstream of these areas requires access over areas where infiltration can reduce surface water flow, and thus accessibility. This can even affect spawning distributions in large tributaries. Additionally, the many cascades or waterfalls in WRIA 1 are partially passable for migratory fish, and while conditions can change (for example log jams formed at channel constrictions), access above these partial barriers appears to be discharge dependent.

It is also important that instream structures (dams, diversions) and stream and river crossings (roads and railroads) provide for full passage of all life stages of species expected to use habitat upstream or downstream. While many existing culverts provide passage for some fish at some flows, if they have outlet drops, if they do not have natural bed material throughout the length of the pipe, or they are less wide than the bankfull channel, they probably constitute partial fish passage barriers. Undersized culverts or culverts placed at too steep a gradient frequently result in water velocities so fast that they block migration during periods of higher flow. Diversions and other water intake structures need to have proper screening in place to prevent entrainment of juveniles. Water diversions also need to provide adequate ramping rates (i.e., rate of change in flow fluctuations). This is necessary to avoid large and rapid changes in flow levels in order to

allow fish downstream of the point of diversion time to adjust to the changes and avoid being stranded or killed.

- Spawning and Incubation

Each salmon and trout species has optimal temperature ranges for each lifestage (upstream migration, holding, spawning, incubation, rearing, smolting). Bull trout and Dolly Varden have spawning that commences as temperatures drop in late summer and fall, and these fish have the most stringent temperature requirements for spawning and early rearing. Bull trout spawning occurs when water temperatures drop to about 8 degrees C, and temperatures above 15 degrees C are generally thought to limit the distribution of these fish. Early chinook and riverine sockeye are the earliest spawners, with pink salmon also spawning in late summer. Streams and rivers with high temperatures can disproportionately affect these species due to their early spawn timing.

After spawning, it is very important to maintain adequate flows through the incubation period in order to maintain favorable incubation conditions including optimal temperature and dissolved oxygen levels. An additional water quality variable important for successful egg to emergence survival is fine sediment. Elevated fine sediment levels in spawning gravels can reduce salmon and trout egg to emergence survival.

Areas with waters receiving contributing flow from ground water can be very important for salmon and trout spawning and rearing. Some species including chum preferentially spawn in areas that have upwelling hyporheic flow. Ground water may also provide important localized temperature refugia for juvenile rearing and adult holding in reaches with high water temperatures

The narrative above has provided an overview of general habitat needs for WRIA 1 salmonids and how water quality, water quantity, and instream flows affect that quality and salmonid use of available habitats. The *Matrix of Pathways and Indicators* (NMFS, 1996) was developed using the best available science and provides quantitative targets for key habitat measures. Included in the matrix are properly functioning condition targets for salmonid habitat. In addition, the WRIA 1 Fish Habitat and Instream Flow technical

teams developed a report titled *Temperature and Dissolved Oxygen Warning Indicators* (March 2003). This report was developed to help guide USU investigators identify biologically based thresholds to be factored into the instream flow and water quality model analysis. This document and the NMFS (1996) document provide specific measures to be used in the WRIA 1 Project to identify actions necessary to protect and restore fish stocks and by which progress towards that and other goals can be measured.

Limiting Factors

Habitat limiting factors are grouped into seven main areas: access; floodplains; riparian; streambed/sediment/large woody debris; water quality; water quantity/instream flows; and estuary/nearshore marine. These are the same groupings being used in the draft WRIA 1 Salmonid Recovery Plan under preparation by the WRIA 1 Salmon Recovery Board. A brief description of each factor is provided below. Additional details will be provided in the draft Salmonid Plan, and can also be found in the *Salmon and Steelhead Habitat Limiting Factors in WRIA 1, the Nooksack Basin* (Smith, 2002).

- Access

Access refers to the ability of fish to physically reach and utilize the range of habitat types to which they are adapted. This includes habitats with historical documentation of use as well as those that, based on physical characteristics, are presumed to provide habitat functions. Loss of access to these habitats may limit one or more salmonid lifestages and reduces productive capacity. Manmade changes affecting access include placement of road culverts that block fish passage, disconnection of the main channel or estuary of a river or stream from off-channel areas and floodplain wetlands by levees and dikes, water withdrawals that either dewater a stream reach or reduce flows sufficiently to prevent fish passage, and water diversion structures that are not passable.

- *Culverts* - Whatcom County Public Works is currently conducting a comprehensive inventory of road culverts within WRIA 1 to determine the location and amount of habitat blocked by culverts. This project is scheduled for completion by June 2005. Preliminary data and data from existing inventories

indicate that most (>60%) of existing culverts on fish bearing streams are barriers. This number will become more precise as the comprehensive inventory is completed. In the Nooksack Basin the barriers affect, with the most affected species listed first, coho, cutthroat trout, rainbow trout, steelhead, chum, and bull trout. The impact to bull trout is likely to be a restriction of access to bull trout foraging and migration habitats. In the Coastal drainages, with most affected species listed first, are rainbow, coho, cutthroat, steelhead, chum, sockeye, and bull trout that experience blocked access to historic and presumed habitats.

- *Levees and Dikes* – Historically, many reaches of the Nooksack River in the forks, mainstem, and estuary (both Lummi Bay and Bellingham Bay) contained numerous remanent river channels, had flow split into two or more channels on the floodplain, or had extensive floodplain wetlands. These areas out of the main flow of the river provided important spawning habitat for some species, such as chum and coho, rearing habitat for numerous species of juvenile salmonids, and refuge for adults and juveniles during high flow events. The latter is all the more important as the habitat complexity in the mainstem has become simplified by removal of woody debris and flood control structures (i.e., rip rap, levees). Access to these habitats was blocked by the historic construction of levees to contain the river during flood flows and by dike construction to prevent tidal inundation of estuary areas so that agriculture could occur. Flood and tide gates installed to allow water to drain from behind the levee or dike typically do not provide for fish passage.
- *Dewatering* - Fish require sufficient water depth to move between habitat type (e.g., main channel to side channel and back), to move up or down the length of a given stream, to avoid predation by birds (e.g., heron), and to keep habitats wetted during key life stages (i.e., keeping salmon redds covered with water during incubation). This is often a critical issue in some streams during the low flow period of late summer and early fall. Dewatering may occur as the result of natural conditions such as low flows combined with a stream reach that “loses”

water to the ground such as on the alluvial fan of Porter Creek on the Middle Fork. This natural condition can be made worse by increases in sediment delivery to the alluvial fan as the result of upstream land management activities.

Dewatering may also occur in the lowland areas of WRIA 1 due to a combination of natural and manmade factors. The lowland streams are dependent on rainfall and ground water to provide stream flow. During the dry summer months, stream flows naturally diminish. However, the summer low flows have been affected by a reduction of ground water recharge due to wetland drainage and filling, installation of drain tile, creation of impervious surfaces, reduction of the frequency and duration of floodplain inundation and ground water recharge, and by diversion of water directly from the stream and, potentially, ground water pumping from wells hydraulically connected to the river or stream.

- *Water Diversion Structures* – Structures placed in streams for the purposes of diverting water can restrict or eliminate fish access. This may occur due to the placement of a weir across the width of the channel that fish are not able to navigate or the lack of appropriate screening on the intake structure. The latter may result in fish (especially juveniles) being entrained in the intake and run through the diversion system. This typically results in fish mortality.

- Floodplain

Floodplain refers to the loss of connections to estuaries and wetlands (described above), drainage and filling of floodplain wetlands, loss of in-channel and floodplain habitat forming woody debris, and changes in channel pattern and confinement. Key habitat issues and limitations for floodplains include:

- *Floodplain Connections*- As described above, the loss of physical connections between habitat types limits the total area of habitat available and thus limits the productive capacity of WRIA 1. Efforts are underway by the salmon co-managers to use the Ecosystem, Diagnosis, and Treatment (EDT) (Moberland Biometrics) model to evaluate, for chinook, the magnitude of the limitations and to define the locations and types of work that will produce the greatest return.

That effort is focused on the Nooksack mainstem and forks and major tributaries. Early results indicate that channel simplification and loss of off-channel habitats in the floodplain areas of the South Fork and Nooksack mainstem are significant factors in the ability to restore viable populations of key salmonids in WRIA 1.

- *Draining and Filling of Floodplain Wetlands* – Draining and filling floodplain wetlands is a habitat limitation for three reasons. First, it results in a loss of the physical habitats that connected floodplain wetlands provide. Second, flood attenuation benefits are lost because wetlands slow, hold, and slowly release flood waters. Thirdly, summer low flows and high water temperatures may be worsened due to loss of benefits provided by wetlands including water storage and ground water recharge and discharge to streams. These factors are most pronounced in the mainstem Nooksack River, Sumas River drainage, and the lower reaches of the larger Nooksack tributaries (e.g., Bertrand, Kamm, Fish Trap) and coastal streams (e.g., Dakota, Whatcom).
- *Woody Debris Loss*- Woody debris of all sizes is an essential ingredient in forming complex fish habitat and maintaining channel functions in WRIA 1 streams. Individual pieces and accumulations of wood form pools, provide complex cover for juvenile and adult salmon, create habitat for aquatic insects on which fish feed, and provide hydraulic “roughing” of the stream bed and banks thus dissipating stream energy and reducing bank erosion and stream bed scour. Historically woody debris has been removed from river and stream channels to improve navigation, improve flood conveyance, and, arguably, to reduce erosion of properties adjacent to the river. Additionally, the historic removal of riparian vegetation to provide for other land uses or placement of levees has largely eliminated the source of future large woody debris through the majority of the mainstem Nooksack River, its tributaries, and Coastal drainages.
- *Changes in Channel Pattern and Confinement* – As discussed above, historic land management practices adjacent to and in WRIA 1 rivers and streams has produced a simplification of channel form resulting in a shortening of channel length and

confining of the channel between levees. The South Fork between its confluence with the North Fork and upstream to Skookum Creek reflects this history of incremental channel shortening. Since surveys in the 1880's, the South Fork has lost 86 percent of its slough-type habitats and been shortened in length approximately 37 percent (Crown Pacific, 1999). Much of this shortening is the result of bank hardening that has trained the river into a single channel and that has disconnected the river from the floodplain and its historic wetlands and sloughs. On-going work to assess historic channel conditions provides insight into the type and magnitude of historic changes, provides habitat restoration targets, and provides a means to evaluate the relative benefit of various restoration alternatives and regulatory approaches.

- Riparian

Riparian refers to the removal of mature riparian vegetation through historic land clearing and timber harvesting. This removal results in a loss of woody debris recruitment to streams (especially the large woody debris that helps form and maintain functional fish habitats), and high summer water temperatures that cause stress and/or mortality to native salmonids. Riparian areas also provide food (insects), moderation of cold winter temperatures, reduction in sediment discharge from uplands, and reductions in channel erosion. The uppermost-forested areas of the Nooksack and Fraser tributaries within designated wilderness areas or North Cascades National Park retain the most functional riparian zones while the middle watershed and lowlands are largely lacking.

- Streambed/Sediment/Large Woody Debris

This grouping refers to the interplay between how sediment is supplied to and routed through river systems, how the shape of the streambed reflects the sediment budget (sources, transport, storage, export), and how large woody debris functions to help meter sediment through the system and form complex instream habitats. Even in a watershed that does not experience land management impacts, sediment is generated, delivered to streams, and either stored or routed downstream. This supply and transport of sediment are essential to forming and maintaining high quality fish habitats. However,

management impacts, such as landslides from logging roads (Zander, 1996, 1997, 1998; Watts, 1996, 1997), land clearing, riparian vegetation removal, and channel armoring can change the volume and the sizes of sediment in a stream reach. Increased sediment load coupled with removal of in-channel large woody debris has produced a simplified channel form with fewer and smaller pools and other complex habitat features than was present historically. A change in the size of the streambed sediment, usually more fine sediment that clogs the pore space in the gravel, is also noted. This fine sediment can smother eggs, can entomb alevins (baby salmon before they come out of the gravel), and can reduce spawning opportunities if the streambed becomes too cemented with fines.

- Surface Water Quality

High summer stream temperatures, low dissolved oxygen, nutrients, suspended sediment, and chemical contamination are identified as water quality limiting factors in WRIA 1. High stream temperatures are found throughout WRIA 1 and are related to poor riparian shading. This is an especially critical factor in the lowland streams. Low dissolved oxygen levels in streams can stress or kill fish. Primary factors leading to low dissolved oxygen are high stream temperatures and high levels of organic materials that consume oxygen as they decompose. Elevated suspended sediment conditions, measured as turbidity, result from both natural and land management related sources. Natural sources include discharge of glacial “flour” from the glaciers in the headwaters of both the Middle and North Forks and natural erosion of Pleistocene glacial deposits underlying or adjacent to WRIA 1 rivers and streams. Loading of fine sediment to streams can result from road runoff, erosion of fallow farm land, runoff from existing development or that under construction, and from stream bank erosion exacerbated by streambank revegetation, loss of in channel woody debris, and channel enlargement due to increased stream flows as the result of storm water runoff from developed areas.

- Surface Water Quantity/Instream Flows

Insufficient water quantity in a stream has been identified as a general limitation to fish in WRIA 1. The ongoing instream flow assessment is expected to generate specific data that will help WRIA 1 resource managers identify where and when streamflow is a

limit to fish. This is being accomplished by measuring instream flows at “representative reaches” through the watershed and extrapolating those results to similar streams that are unmeasured. Dry weather cycles, annual variations in streamflow, and/or water diversion for out-of-stream uses can become serious issues for fish because of their implications to water quantity and water quality. The occurrence of any or all of the listed events can reduce flows in a given stream reach resulting in reduced access to habitats, the dewatering of redds, stranding of fish. Additionally, due to a reduction in stream flows, reductions in water quality may occur (e.g., high water temperatures, low dissolved oxygen levels).. In the upper watershed, this effect is most noticeable on alluvial fans, such as Porter Creek in the Middle Fork, where summer low flows can often coincide with pink salmon spawning. In the lower watershed, water quantity has been diminished by a combination of wetland loss, channelization, agricultural drainage, and water withdrawal for out of stream uses.

- Estuary and Nearshore Marine

Habitat limitations in the estuary and nearshore marine areas of WRIA 1 relate to wetland loss, water quality and sediment contamination, shoreline modification including bulkheads, boat ramps, slips and piers extending into this environment. The actual quality of habitat functions vary across the WRIA 1 marine shoreline and range from being in good shape to being highly impaired. These habitats are important to salmon as they provide juvenile rearing habitats, protection from predation, and spawning habitats for the forage fish (e.g., surf smelt and sand lance) on which salmon and other species depend.

Next Steps

Development, implementation, and oversight of actions needed to address recovery of salmon populations and the habitat upon which they rely is being conducted under the guidance provided by the WRIA 1 Salmonid Recovery Plan. This includes key actions necessary to address recovery of ESA listed stocks. The WRIA 1 Salmonid Recovery Plan is being developed under the auspices of the WRIA 1 Salmon Recovery Board. Continued coordination will be needed between the WRIA 1 Project and the WRIA 1

Salmon Recovery planning and related implementation process. This coordination will occur through the on-going participation of the Co-Managers in the WRIA 1 Project in the Fish Habitat Tech Team and other groups such as the Staff Team and Joint Board, as well as interaction of the WRIA 1 Salmon Recovery Board.

2.3.1.7 Decision Support System

Background/Purpose

An integral part of the technical assessment work of the WRIA 1 Watershed Management Project is the development of a computer-based decision support system (DSS) and the associated training and maintenance required for its use. The DSS is a tool that links all of the data and computer models together in a way that enables decision-makers to explore trade-offs among competing management alternatives and policies that can be defined. The various management alternatives and policies are referred to as scenarios for purposes of running the DSS.

The DSS itself is composed of modules and models that together provide the framework to develop management alternatives, model their implementation, and examine the results to allow for knowledge-based decision-making. Some of the specific components of the DSS are listed below along with a brief description. Additional details and descriptions of the Watershed Characterization and Data Visualization Modules are provided in the methods/results section that follows. The remaining modules are being completed as part of the Phase III work and will be available as this work progresses.

- Watershed Characterization - This module enables the user to access a wide variety of summary water resource information on a particular drainage or aggregate of drainages selected by the user.
- Data Visualization – This module enables the user to access spatially explicit data and analytical capabilities at a greater level of detail than is possible with the Watershed Characterization module.

- Scenario Builder – This module provides the user access to a systematic process by which watershed management options can be defined and evaluated within the DSS framework.
- Database Management System – This module manages all the linkages required for communicating relevant information and data between other modules of the DSS.
- Analysis modeling system – This module manages the actual model runs for all surface, ground, and instream flow and fish habitat models.

Methods/Results

All of the work associated with development of the DSS has been conducted by USU in coordination with WRIA 1 Project participants and, in particular, the DSS Technical Team. The initial (Phase II) work focused on three activities:

1. Developing the databases for each technical area (water quality and water quantity, instream flow, and fish habitat) and the more general WRIA 1 watershed level characterizations (i.e., zoning, land use, drainage boundaries, etc.);
2. Initiating development of the watershed characterization module; and
3. Initiating development of data visualization modules.

Details on these activities are provided below.

Database System

Database work included compiling information from existing sources and, for some project elements, collecting new information. Databases compiled under the Phase II technical work included:

- Ground Water

The ground water database includes: surficial aquifers, public water supply wells including well depth, water treatment type, well capacity, and resident population; surficial aquifer depth to water contours based on well information; water table contours based on selected wells and surface water elevations; USGS wells from

ground water site information; surficial aquifer thickness based on well information (Sumas-Blaine); critical aquifer recharge areas as designated by Whatcom County; potential ground water contamination sources; wellhead protection zones for Washington state; recent well head protection zones including both circular and non-circular from WCHHSD locations; Whatcom County Health and Humans Services Department (WCHHSD) well log database; USGS pdf maps on project area ground water system and surface water system downloaded from the USGS site; USGS National Water Information System (NWIS) well database; Washington DOE well database files from Aquifer Vulnerability Project; well location layers prepared from well data/attributes; water elevation layers were interpolated for years of records with the most wells (1971, 1972, 1990, 1991, 1994, 1995); surficial and non-surficial hydraulic conductivity layers interpolated for the LENS area; and depth of impermeable layer interpolated for the LENS study area.

- Surface Water

The surface water database includes: miscellaneous streamflow measurements conducted by various agencies; precipitation contour coverages from the DOE; Rivers GIS coverage from the USGS-HUC (Hydrologic Unit Code) and EPA; WRIA 1 sub watersheds developed by WRIA 1; stream gage data for 29 stations including annual and monthly average streamflow, time series tables/graphs, locations (lat-long), annual and monthly exceedance relationships; Washington DOE ambient water quality database; Washington DOE environmental information management database; USGS national water quality assessment data warehouse; Whatcom County Shellfish Protection Districts Water Quality Database; Western Washington University Institute for Watershed Studies Lake Whatcom Monitoring Project long-term monitoring data; Lummi Nation Natural Resources temperature data; Lummi Nation Skookum Creek Hatchery monitoring reports; Nooksack Indian Tribe Water Quality Department water quality data; Western Washington University Institute for Watershed Studies Kamm Creek Watershed monitoring project; Whatcom Conservation District Acme Watershed water quality monitoring

project Phase I: 1998-1999; City of Bellingham Middle Fork Nooksack temperature data; surface water quality data collected during the Utah State University field study.

- Other

Other database information includes: land use/land cover created from the USGS GIRAS files; Washington state major shorelines and state boundaries. In addition, miscellaneous GIS base-layers were developed including 10m and 30m DEM coverage for both US and Canadian data. Where needed, transformations into the project UTM Zone 10 NAD83 map projection have been made. The development of metadata (information about data such as source, accuracy, projection) files was initiated in Phase II. Many of these data are directly linked to the Watershed Characterization and Data Visualization tools described in the following sections.

Watershed Characterization

The Watershed Characterization Module enables the user to access a wide variety of summary water resource information on a particular drainage or aggregate of drainages selected by the user. Over 50 categories of information will be provided for the selected area, including (as applicable) aquifers location, recharge areas, wellhead protection area, surface water hydrology, legally established instream flow requirements, water quality data, fish species and habitat, precipitation, shellfish, zoning, land cover, and economic indicators. A report will be generated displaying the information for the selected area. The final report is a PDF file that may be printed. Following are sample pages from the final report Figures 2.36 through 2.40 illustrate the use of the Watershed Characterization tool and provide examples of the type of information that can be displayed.²⁰ Figures 2.41 through 2.43 are sample pages from the generated report.

²⁰ These figures represent works in progress and may be modified through Phase III efforts. For example, Phase II work focused on compiling information based on 20 predefined aggregated areas. Phase III work will provide information on a smaller drainage basis (177) if desired by the user.

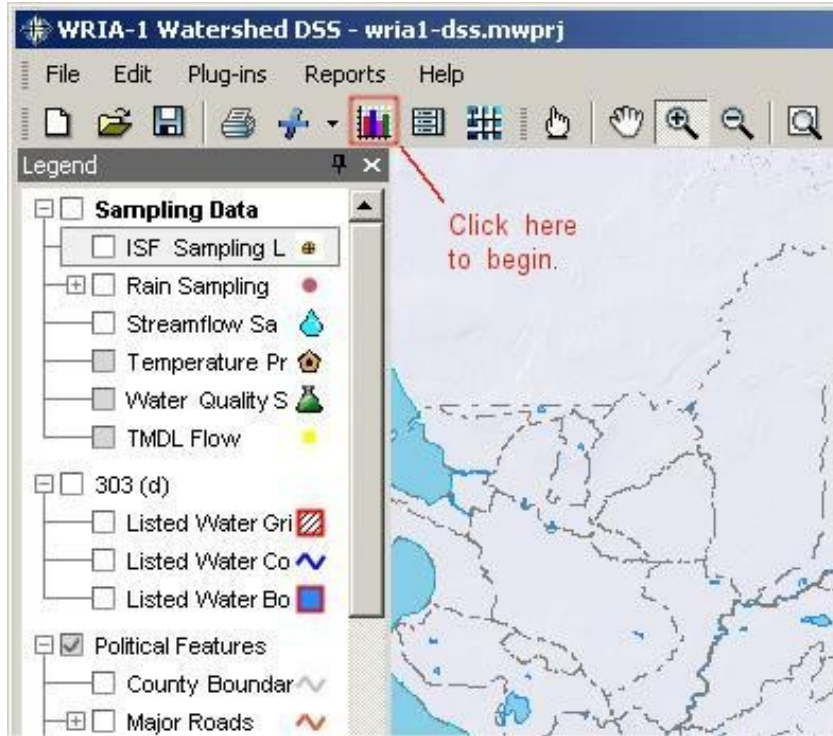


Figure 2.36: Starting the Watershed Characterization



Figure 2.37: Watershed Characterization form used to select the drainages for generating a report

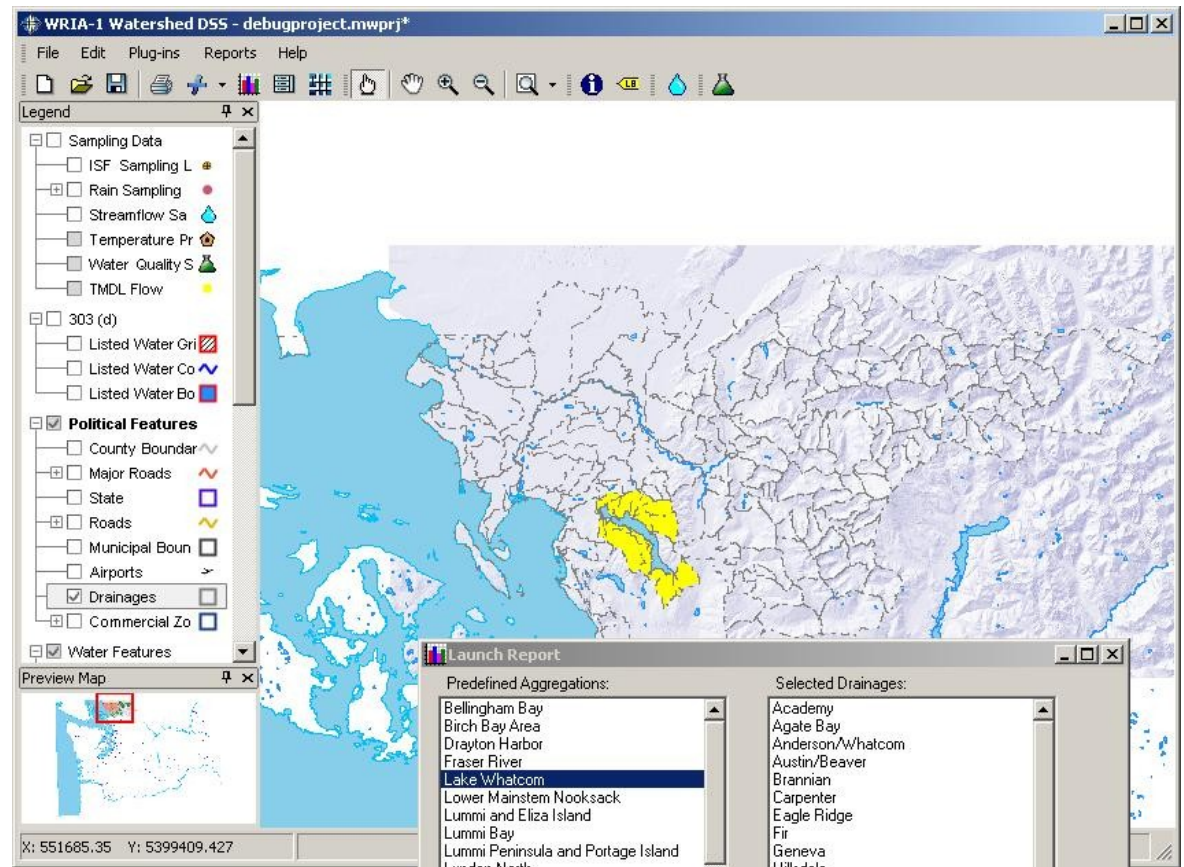
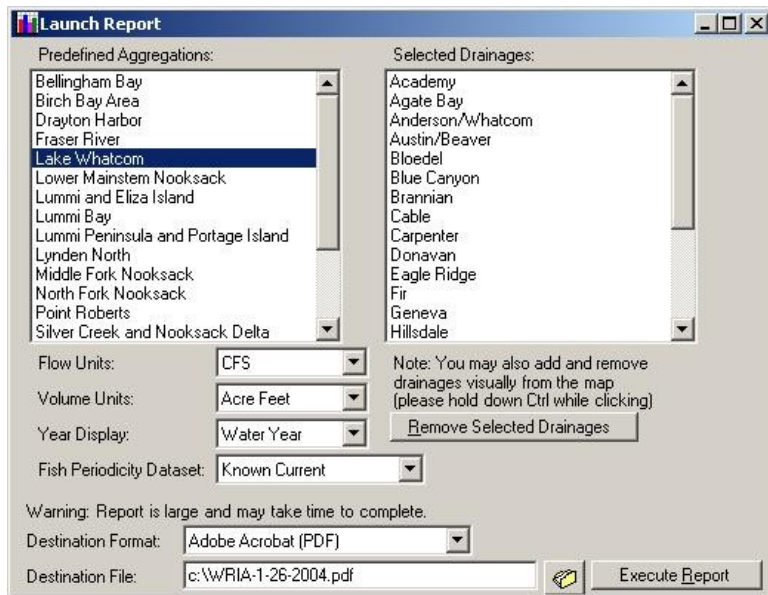


Figure 2.38: Selecting a predefined aggregation of drainages

Figure 2.39: Selecting drainages and creating new aggregations by clicking on drainages on the map

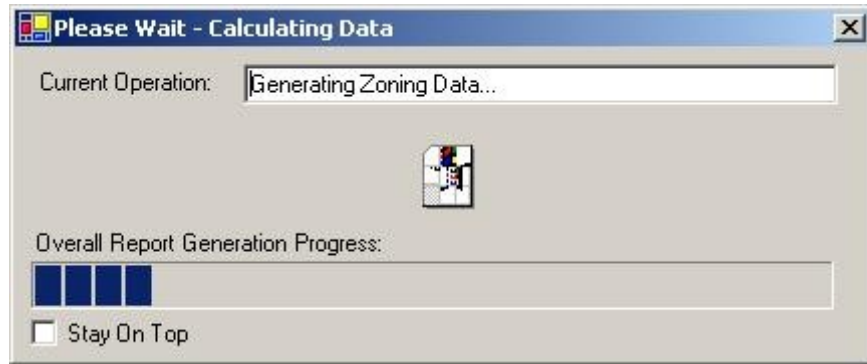


Figure 2.40: Progress indicator is displayed after pressing the “Generate Report” button

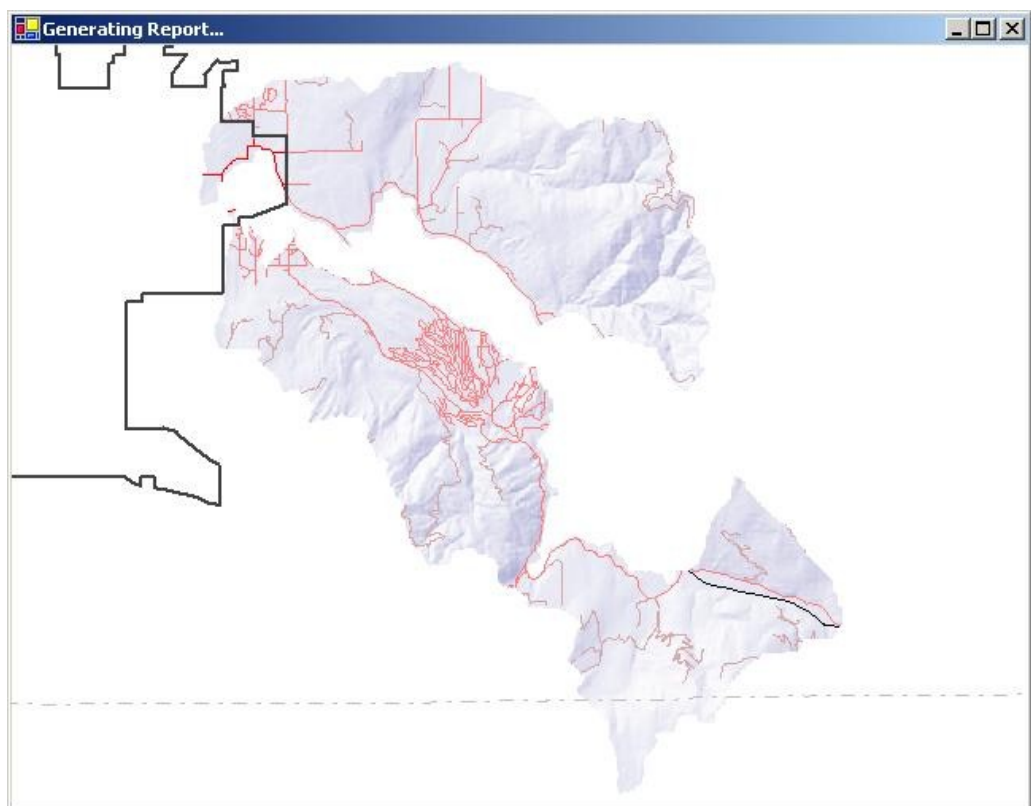


Figure 2.41: Sample of one of the variety of intermediate screens displayed as the report is being generated

The underlying database for the Watershed Characterization module is being designed so that it can be updated with new or revised information as it becomes available. The existing watershed characterization tool is essentially intended to provide an example of the ‘top’ layer of summary data access and visualization capabilities of the DSS.

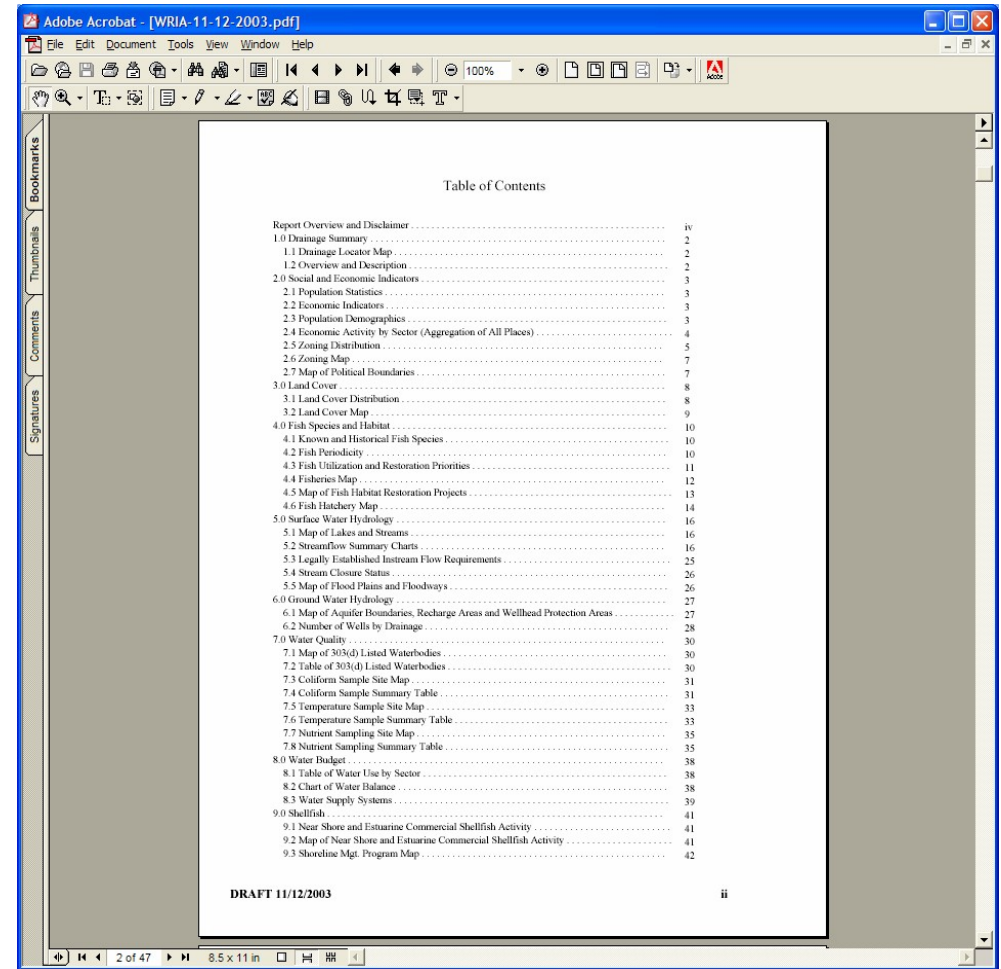
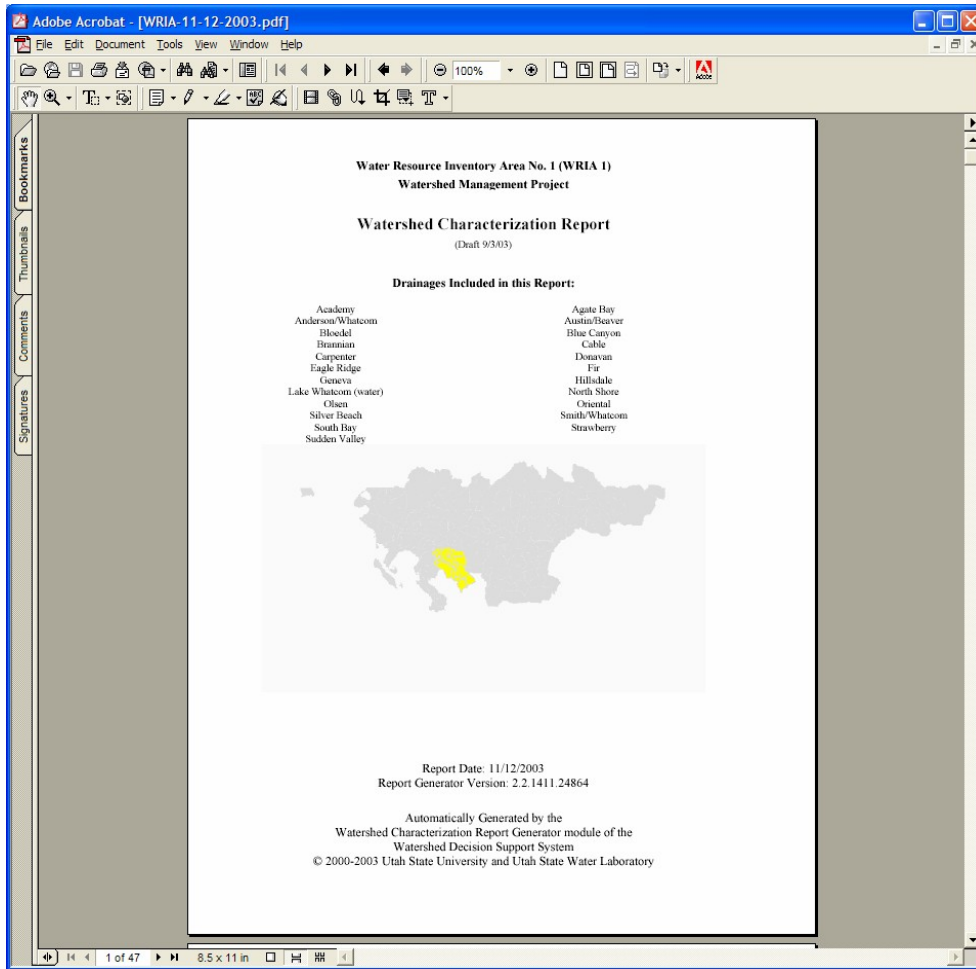


Figure 2.42: The Watershed Characterization report is generated as a printable PDF file.

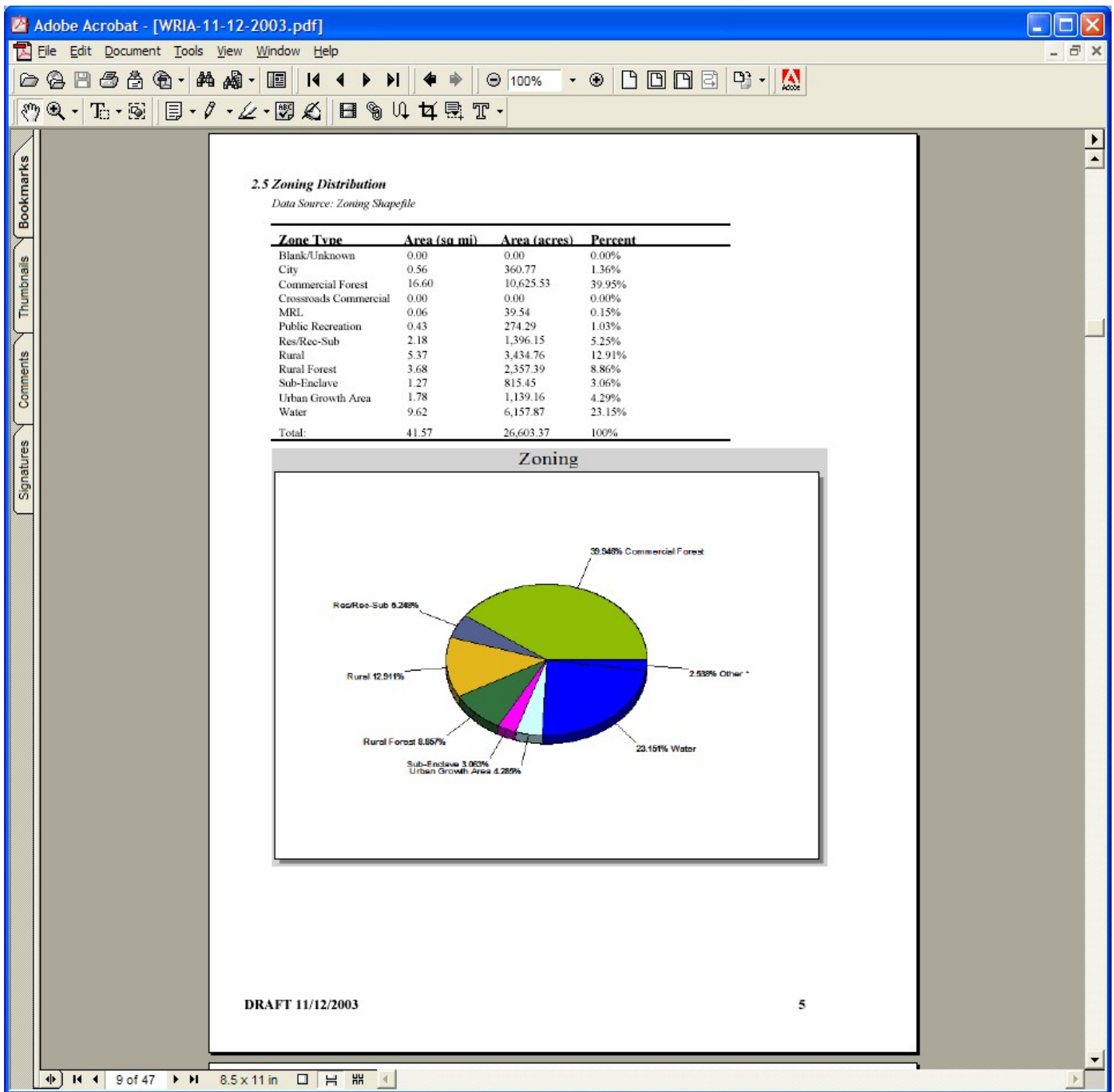


Figure 2.43: Sample of the type and format of information displayed in the Watershed Characterization report.

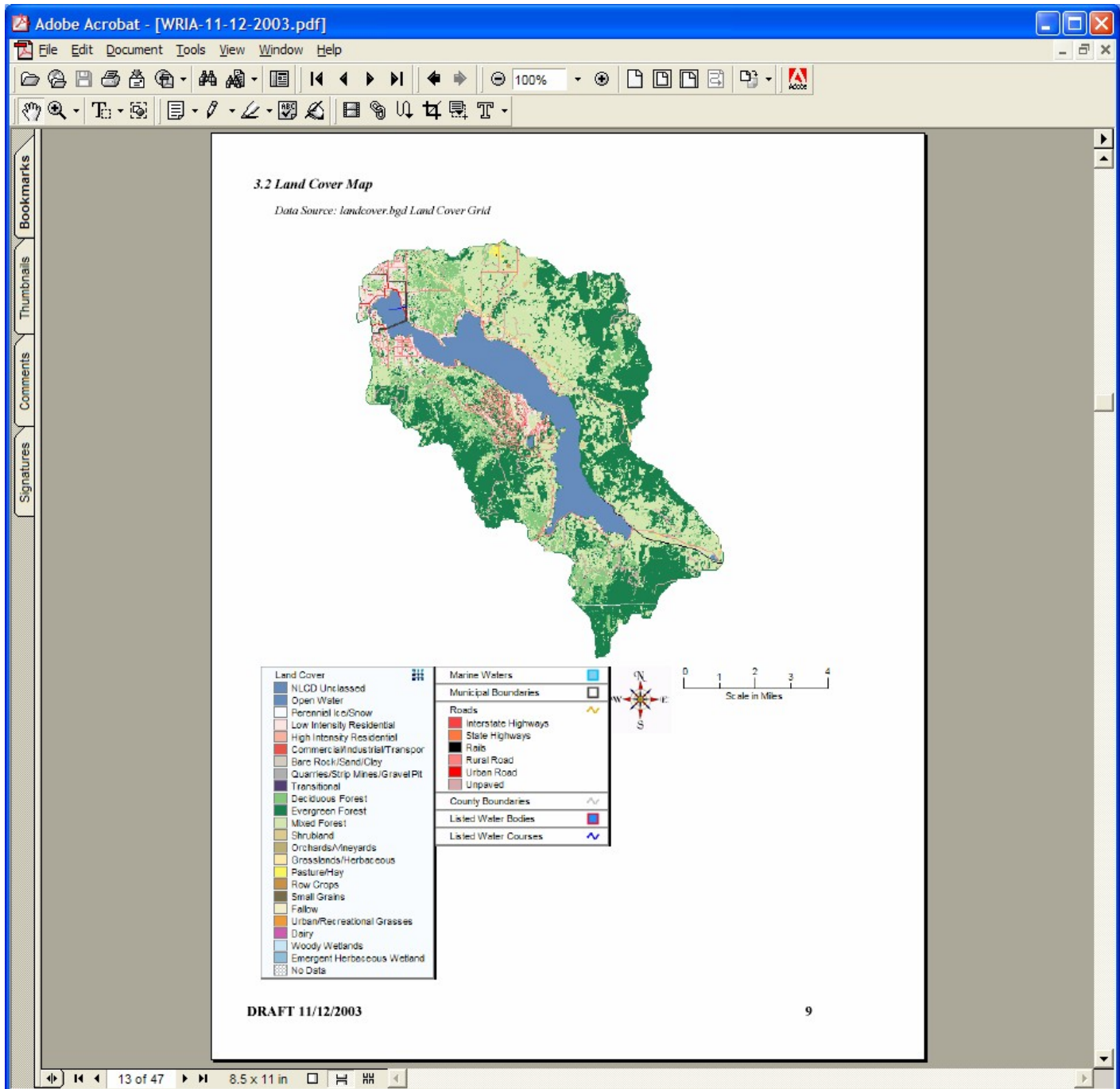


Figure 2.44: Information displayed in the Watershed Characterization report are printable as PDF files.

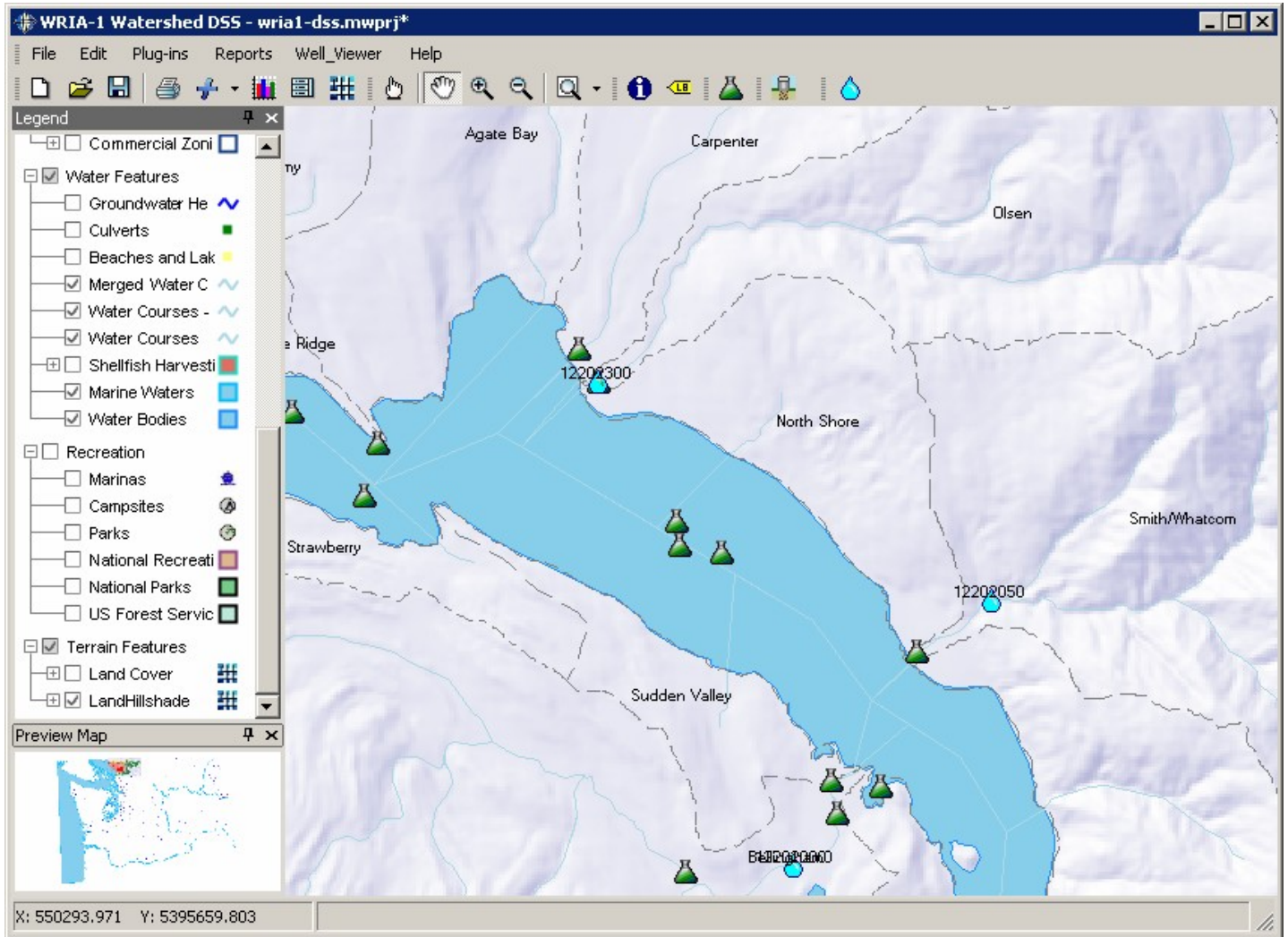


Figure 2.45: Base GIS data visualization module, MapWindow, loaded with base GIS data sets

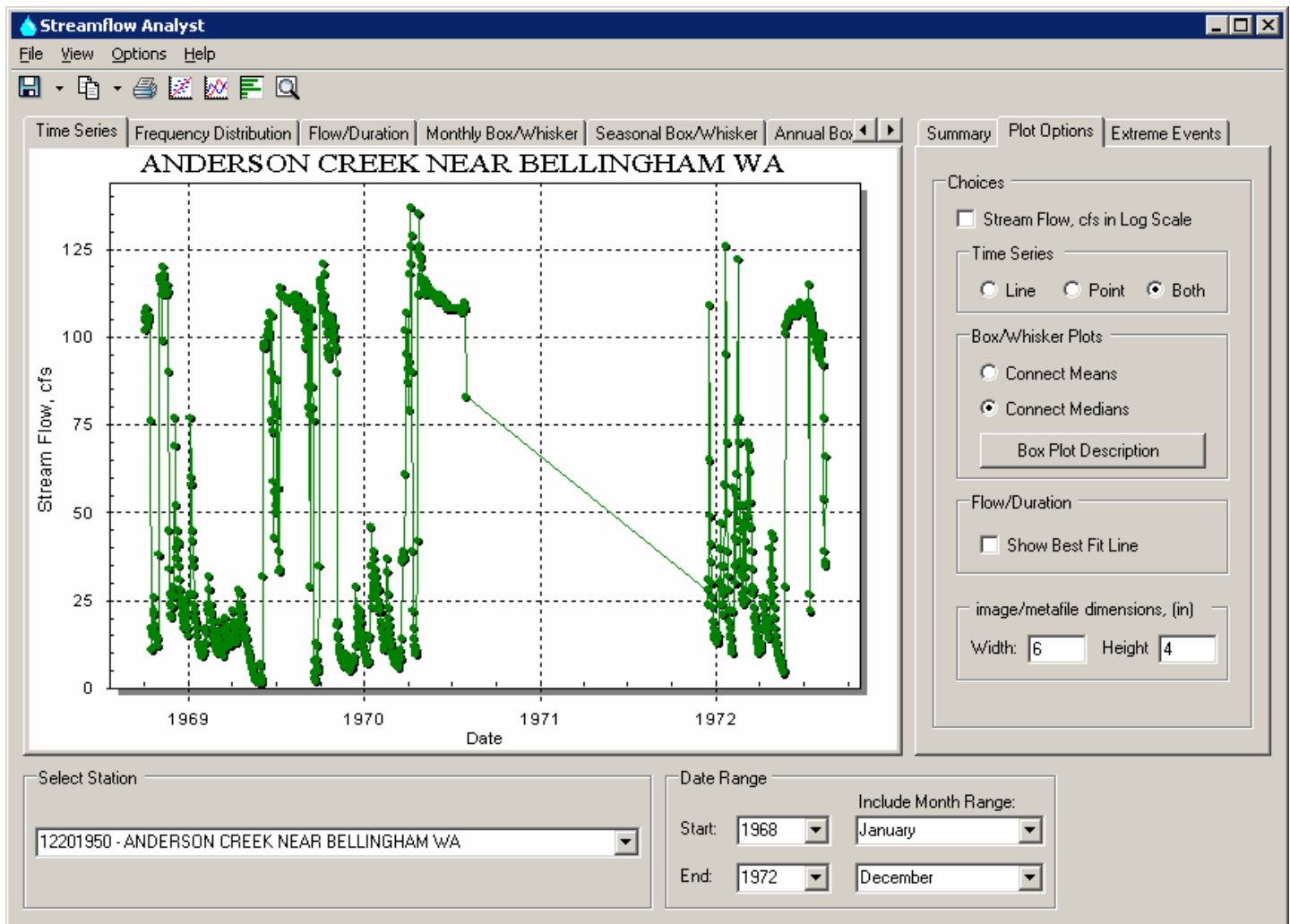


Figure 2.46: Sample screen display showing the streamflow analyst loaded with data from a streamflow station

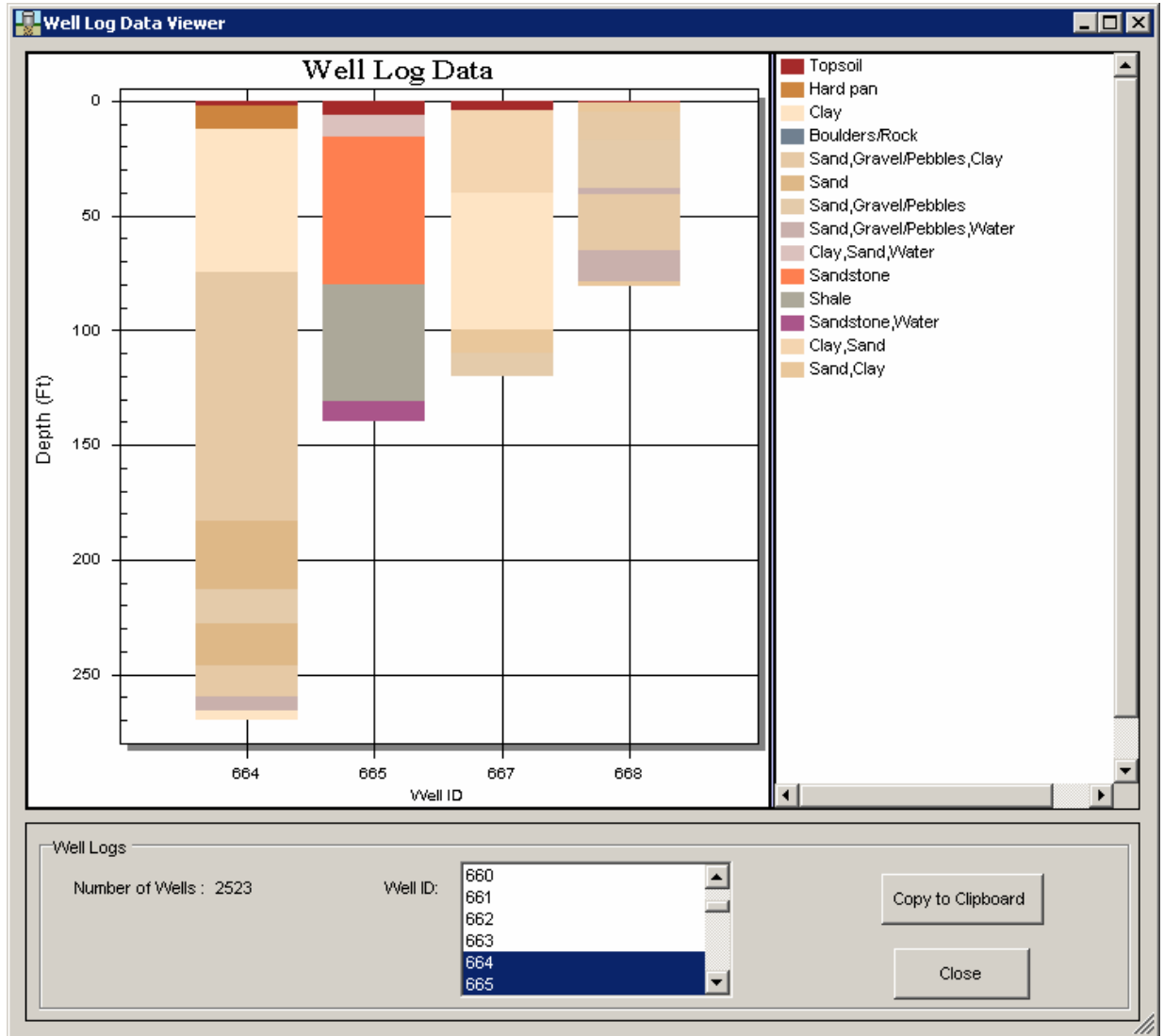


Figure 2.47: Sample screen display showing well log data viewer loaded with 4 separate well log records

Data Visualization

The Data Visualization module enables the user to access spatially explicit data and analytical capabilities at a greater level of detail than the Watershed Characterization module for a variety of technical data sets including stream water quantity and quality, ground water quality and quantity, and fish habitat data including species distributions, life stage periodicities, and all relevant hydraulic and habitat modeling results at all field sites. The system was designed to allow pre-defined GIS shape files to be added as overlays to the spatial extent of WRIA 1 and then provide the user access to spatially

explicit information contained within the database (see Figure 2.45). For example, the user can add or delete data layers that are to be included and/or displayed, select specific sample locations, types of data, time periods, and types of analyses to be conducted (Figures 2.46-2.47). The data visualization and analysis tool can display over 30 different water quality parameters utilizing over 15 different plotting functions. All graphs can be modified by the user and exported in a variety of graphical formats. In addition to the graphical displays, the system has built-in statistical summary capabilities.

The USU Phase II efforts focused largely on accessing the water quality database (and surface water stream gage data), but ultimately all technical components (water quality, water quantity, instream flow, fish habitat) will be accessible through the Data Visualization Module.

Next Steps

Phase III work is focused on completing all of the modules and other components of the DSS. Specific actions include:

- Continued updating and integration of databases;
- Completing the Watershed Characterization Module;
- Completing the Data Visualization Module;
- Completing the Scenario Builder Module (Figure 2.48 illustrates the concept and early development of this module);
- Completing the Database Management System; and
- Completing the Analysis Modeling System.

In addition, initial training on the user-end of the DSS will be provided.

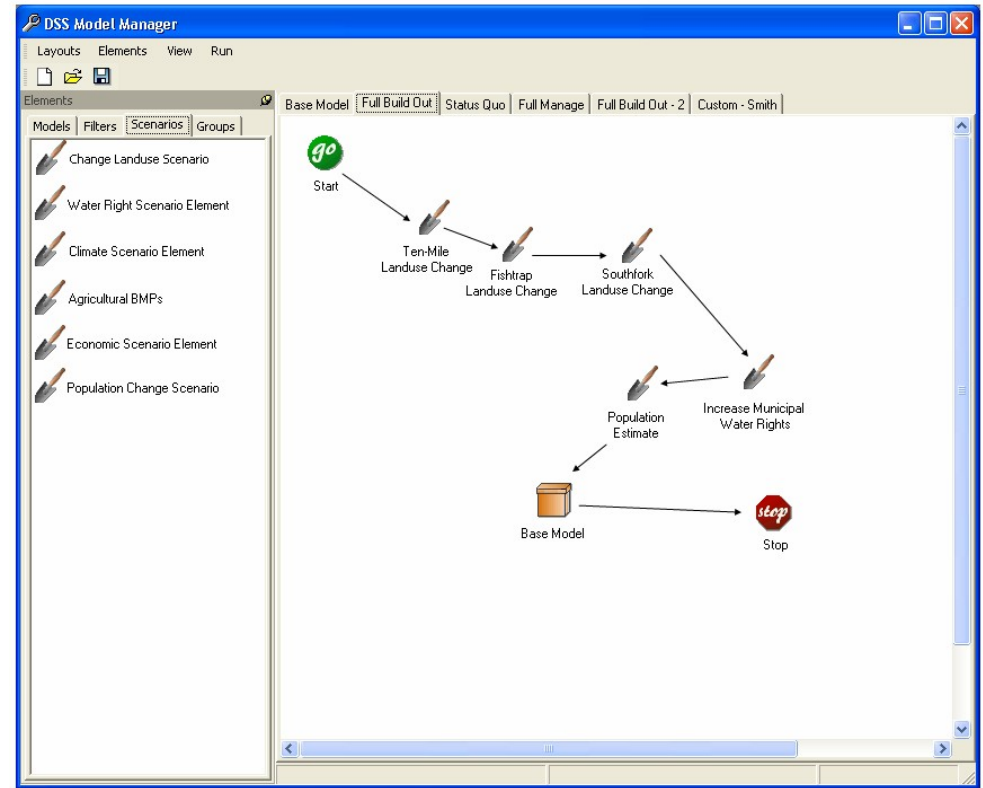
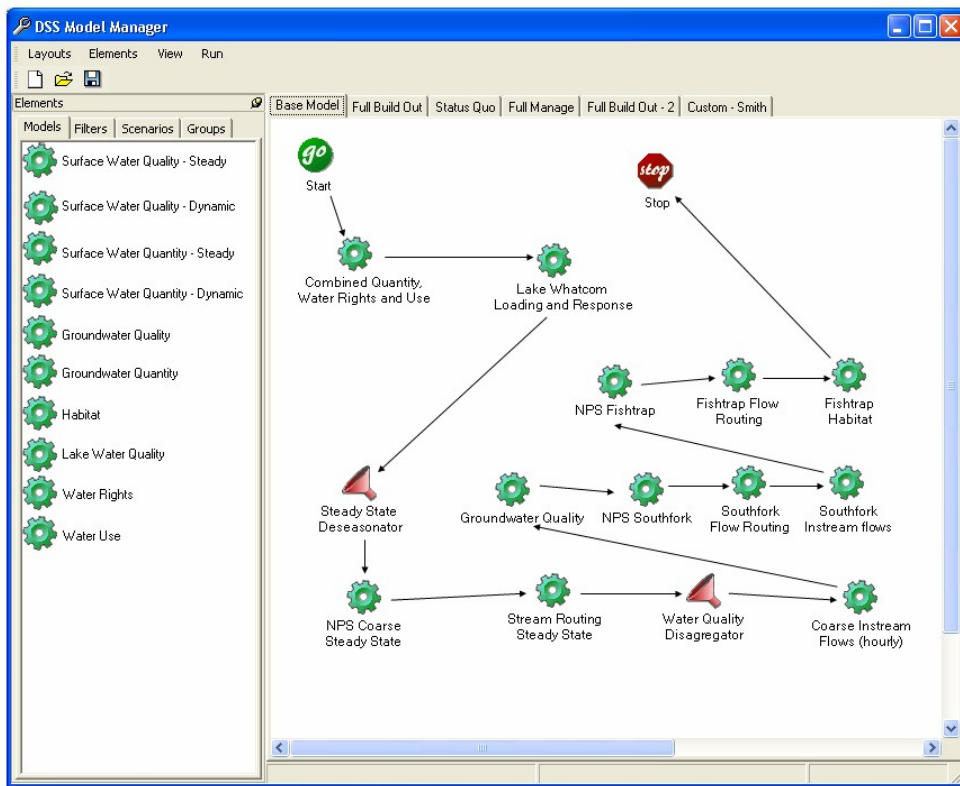


Figure 2.48: Concept and early development of the model manager/scenario builder plug-in

2.3.2 Socioeconomic Assessment

Purpose/Background

An evaluation of the socioeconomic impacts associated with existing and potential changes to water resource management actions was considered important to WRIA 1 Project participants. There are a variety of approaches for evaluating socioeconomic conditions. Determining the depth and breadth of the analysis to be conducted as part of the WRIA 1 Project required a number of discussions between the consulting team and WRIA 1 participants. In determining how extensive the socioeconomic analysis should be, WRIA 1 participants were faced with two general approaches to consider – the first (economic impact study) being less comprehensive than the second (comprehensive cost-benefit analysis):

- Economic Impact Study

An economic impact study provides information about the changes in the economy that occur from a particular event. Typically, the types of changes are narrowly defined and fairly easy to quantify such as employment, personal income, and /or tax revenues. While this information is valuable, it should not be viewed as complete if the objective is to determine the net value of the particular event. Impact studies do not necessarily account for all of the changes to non-market goods and services; may not include important adjustments that could be considered; and may not account for the relevant benefits associated with the project. Impact studies can be viewed as the first step in a more comprehensive cost-benefit analysis.

Socioeconomic Analysis – Understanding the Terminology

Like other fields, socioeconomic work uses a unique set of terms and concepts. One of the key concepts is that of a “good” or “service.” An economic “good” or “service” is something that provides people with satisfaction or “utility.” A tomato is considered an economic good because its consumption provides utility. The tomato is a good whether it is purchased in a market or is home grown. In the former case, it is a market good, whereas in the latter case it is a non-market good. Non-market goods and services are those goods and services which are not exchanged in normal market transactions, but which have economic value nonetheless. (Source: “Task 3.3 – Assessment of Non-Market Goods and Services”)

- Comprehensive Cost-Benefit Analysis

A comprehensive cost-benefit analysis compares all of the relevant cost and benefits associated with the project resulting in information on the net value of the project (or combination of projects). This includes both market and non-market factors.

Through these discussions, it became clear that the analysis should be applicable throughout the WRIA and it should be comprehensive in nature: meaning it should provide information on both the market (e.g., changes in employment, wages) and non-market (e.g., changes in water quality or habitat for salmon) goods and services.

The information below describes the methods and results of the socioeconomic work conducted for the WRIA 1 Project, and identify the additional steps/actions needed to build upon this initial work. As previously noted, ECONorthwest and the Center for Economic and Business Research (CEBR), sub consultants to Parametrix, conducted the socioeconomic tasks.

Methods/Results

The socioeconomic work was divided into six different elements:

- Baseline characterization of local economy (*Summary of Economic Conditions in WRIA 1*);
- Water use and demand (Appendix B of the *Summary of Economic Conditions in WRIA 1* report);
- Assessment of non-market goods and services (*Task 3.3 Assessment of Non-Market Goods and Services*);
- Socioeconomic reports (*Task 3.4 – Socioeconomic Reports*”);
- Long-term data collection protocol (“*Task 3.5 – Long-Term Data Collection Protocol and Summary of Methodology*); and

- Socioeconomic analysis/application of Detailed Evaluation Question matrix (additional work related to each management options must be completed before this can be done).

The results of the socioeconomic work are described in four reports, which are referenced next to each related work element described above. In combination, these reports provide guidance and the initial data needed to conduct a comprehensive socioeconomic analysis of any given water resource management alternative.

It is important to note that these reports do not provide all of the information actually needed to conduct the work. More information is needed to determine the various impacts. The report titled *Long-Term Data Collection Protocol and Summary of Methodology* (Hagen and Hodges, 2003, Task 3.5) provides structure for the data collection effort.

Following is a summary of the overall approach for analyzing the socioeconomic impacts of water resource management actions. This section is followed by additional information about what is contained in each of the reports listed above.²¹

Overview of the General Approach for Analyzing Socioeconomic Impacts

In WRIA 1, the analysis of impacts associated with a given water resource management project is divided into two parts. One part focuses on the impacts of market factors such as employment and wages (market factors) and the other part focuses on changes in non-market goods and services (NMGS). This separation of market and non-market consequences is convenient for a variety of reasons, including the fact that different techniques are needed to quantify the different impacts.

Figure 2.48 shows the major steps that must be completed in the analysis of water resource management alternatives. The highlight box makes explicit reference to the analysis of market impacts and, separately, the analysis of non-market impacts

²¹ Much of the information contained in both these sections comes directly from the Task 3.4 report titled *Socioeconomic Report* (Hagen and Hodges, 2003, Task 3.4).

Analyzing Expected Changes in Market Conditions

Water resource management alternatives could affect water supply in different parts of Whatcom County. Those changes in water supply could, in turn, affect employment, housing, and other segments of the local economy. As a result, the first step in analyzing the expected changes in market conditions was to analyze water use in the county. The resulting report (Appendix B in *Summary of Economic Conditions in WRIA 1*, ECONorthwest, 2002) includes estimates of water use in different parts of the county, including water use per employee in the different industrial sectors, water use per

Objective: Determine the net value of a water resource management project

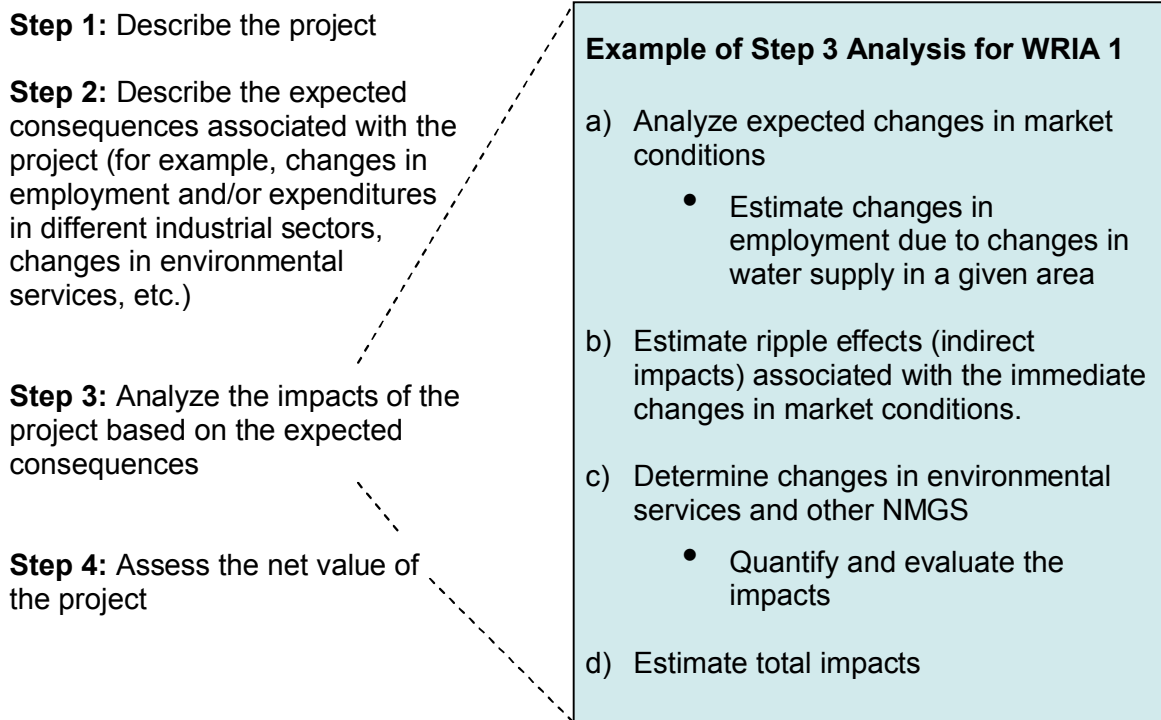


Figure 2.49: Steps in the process of conducting a comprehensive cost-benefit analysis

household, and water use per student (to cover government infrastructure such as schools). These water use figures support estimates of changes such as changes in

employment and the number of homes that might be constructed due to a change in water supply.

While the first step – analyzing water use – has been completed, the direct impacts of management alternatives have not been determined. These impacts cannot be known until the management alternatives to be analyzed are adequately characterized. That is, Step 3 (a) in Figure 2.48 above can be completed only after the management alternatives have been identified.

Once the direct impacts (on employment, income, etc.) of a given project are known, the indirect or ripple effects can be estimated²². The indirect effects are estimated using an input-output (I-O) analysis. An I-O model provides a full accounting of the local economy with a transactions table that shows all interactions of all sectors or industries within the study area. This transactions table includes all inputs, including the labor that each sector “purchases” and all payments that the sector makes (including taxes) to produce its outputs or provides its services. From this accounting, it is possible to determine the indirect impacts of a given project. Equivalently, the I-O model provides estimates of how all the various players in the local economy will respond to the initial change.

This sort of I-O analysis is facilitated by the use of commercially available software packages. The software package to be used in WRIA 1 is the IMPLAN model. The Center for Economic and Business Research maintains an IMPLAN based model for Whatcom County. In addition, the WRIA 1 initiating governments and other participants have approved the use of this model in the WRIA 1 Project.²³

It should be noted that the IMPLAN software could be used to obtain estimates of indirect impacts related to employment, income, and taxes. It does not provide estimates of impacts related to housing or other forms of land use, such as the possible conversion

²² Initial work to assist with this analysis has been done. The report titled *Summary of Economic Conditions in WRIA 1* (ECONorthwest, 2002) shows where jobs are located in the county and sets the stage for determining the ripple effects or indirect impacts that need to be analyzed.

of land from one use to another. These impacts must be modeled separately. Estimates from IMPLAN and other I-O models also do not account for market adjustments. These market adjustments have to be modeled separately.

Finally, it may be important to note that data on employment and income has traditionally been tracked for different industrial sectors according to the Standard Industrial Classification (SIC) code system. The reporting system used by the Washington State Employment Security Department and U.S. Bureau of Labor Statistics switched from the SIC system to the North American Industrial Classification System (NAICS) in January 2003. Some delays are possible in the near term regarding the analysis of employment and income because the commercially available software packages must be converted to the NAICS system and modules for areas such as Whatcom County may not be readily available.

Analyzing Expected Changes in Non-Market Goods and Services

Whenever impacts to Non-Market Goods and Services (NMGS) need to be analyzed, it is necessary to determine the following:

- The NMGS to be considered;
- The changes that are expected with each NMGS; and
- The technique(s) that will be used to quantify the changes.

The NMGS to be considered will vary from project to project. In some cases, the analysis will focus on a particular species or place. In other cases, such as WRIA 1, the analysis will cover a long list of NMGS. As part of the preparation for the Task 3.3 report on NMGS, all participants in WRIA 1 were asked to identify the NMGS that they wanted included in the analysis. The list of relevant NMGS is provided in the Task 3.3 report.

²³ IMPLAN is the software package produced by the Minnesota Implan Group, Inc. Other packages are available, including a package prepared by the US Dept. of Commerce, Bureau of Economic Analysis.

Identifying the expected change to each NMGS is an important step because it is the change that is being valued, not the specific good or service. For example, the task might be to determine the value of a 25 percent increase in the population of early-run Chinook salmon in the Nooksack River. The task is not to determine the value of the salmon. This distinction is important because the focus of the analysis needs to be on the change that is caused by a particular management alternative – and the change in the quantity of or quality of a given non-market good or service is not the same as the entire good or service. The expected changes to NMGS that may result from water resource management projects in WRIA have not been determined because the management projects themselves have not been designed. The methodologies that can be used to quantify changes in or impacts to NMGS are discussed in the Task 3.3 report.

Putting the Pieces Together

In completing a comprehensive analysis of proposed water resource management alternatives the following questions should be considered prior to the start of any additional analysis of the alternatives:

- Are the relevant market impacts being considered? For example, is the focus limited to changes in employment and income when it should include changes in tax revenues or infrastructure requirements?
- Does the proposed methodology for analyzing market impacts include consideration of the natural adjustments that occur in labor and product markets? (e.g., at a minimum, the WRIA 1 participants should agree on items such as the rate at which displaced workers find alternative employment).
- Are the relevant NMGS being considered?
- Does the proposed methodology for comparing costs and benefits ensure that all costs and benefits will be included and that the effects of time are properly considered?

Finally, CEBR recommends that because WRIA 1 Project participants have expressed interest in a comprehensive study (as opposed to an impact study), they retain someone

with expertise in conducting benefit-cost analyses to assist in developing the Request For Proposals and to critique the submitted proposals.

Report Summaries

An overview of what is contained in each of the reports produced for the WRIA 1 Project is provided here beginning with the *Summary of Economic Conditions in WRIA 1*, (ECONorthwest, 2002) followed by the *Assessment of Non-market Goods and Services* (Hagen and Hodges, 2003, Task 3.3), *Socioeconomic Reports* (Hagen and Hodges, 2003, Task 3.4), and finally *Long-term Data Collection Protocol and Summary of Methodology* (Hagen and Hodges, 2003, Task 3.5).

- Summary of Economic Conditions in WRIA 1

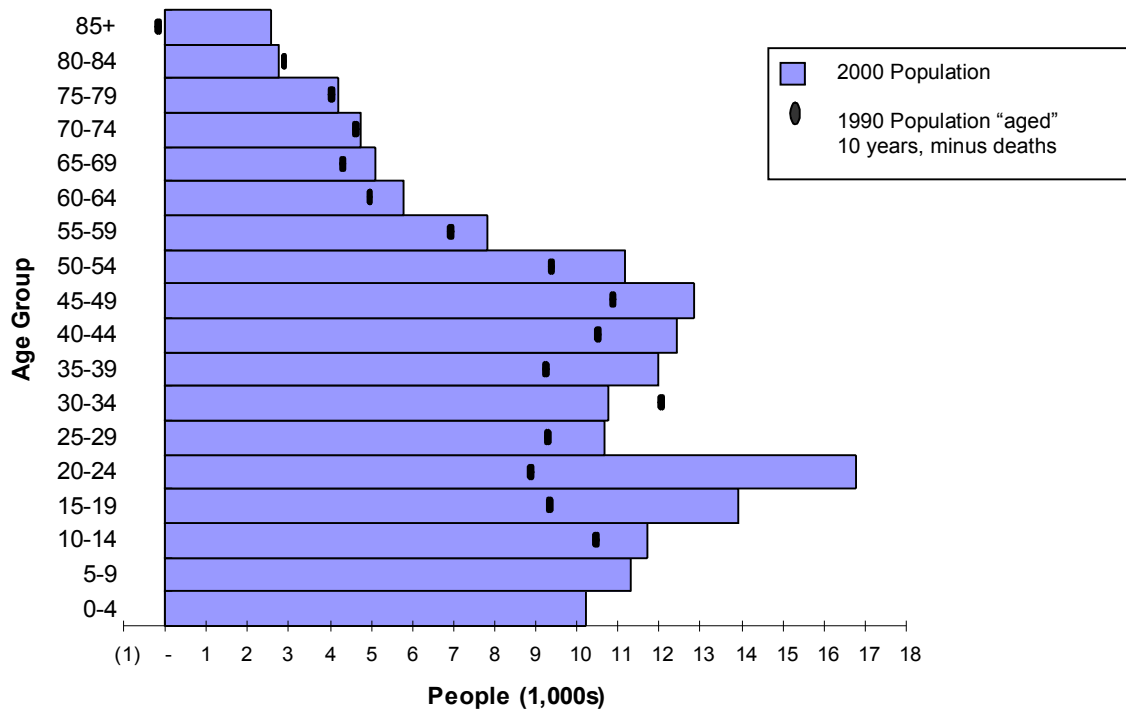
ECONorthwest (ECO) completed this report in fall 2002. The primary purpose of the report is to show where people live and where the jobs are located within Whatcom County, and to offer forecasts for how population and employment might change over time. Population and employment data are readily available for Whatcom County from public agencies. In some cases, forecasts are also available. The problem with the publicly available data, however, is that figures are for the county as a whole or for larger municipalities within the county. It is not possible to obtain data from traditional sources (such as the Washington State Employment Security Department) that show population or employment by drainage basin. However, that type of geographic sorting is needed to analyze projects that would affect land use, the availability of jobs, etc. on a drainage-by-drainage basis. As a result, ECO had to sort the detailed data to show jobs by category and drainage area in a way that was consistent with state reporting/confidentiality laws. ECO also had to apportion published population data by drainage and construct forecasts for future population in those areas.

The following subsections offer glimpses into the information provided in the 54 page summary report. The subsections cover (separately) population, employment, sub-

basin profiles, and other information such as water use estimates. Each subsection contains at least one figure to illustrate the graphics presented in the report.

- Population - The ECO summary report includes an overview of population in Whatcom County and estimates of future population through 2022. All population figures, including the forecasts, are shown by drainage area – not just municipalities as is more typical. The overview also includes comparisons of population growth and composition in Whatcom County versus Washington State.

The report indicates that population growth trends in Whatcom County “follow growth trends for Washington State.” The report also states that, “... population growth in the 1990s was stronger than in the 1980s and late 1970s, both in percentage change and net growth” but that after reaching a peak in 1991 and 1992, population growth declined in Whatcom County from 1993 through 2000. Figure 2.50 is taken from ECO’s summary report and shows population in



Source: U.S. Census Bureau, Washington State Department of Health Center for Health Statistics.

Figure 2.50: Whatcom County population by age group, 2000

Whatcom County in 2000, with black dots to show how the population in 1990 would have changed from 1990-2000. The black dots show population change due to aging and mortality, net of migratory effects. The black dot in the 30-34 age group, for example, suggests that there were fewer people 30-34 year olds in 2000 than would have been expected with the population profile that existed in 1990. This difference suggests out-migration from Whatcom County in that grouping from 1990 to 2000.

As noted in the ECO report, “For most of the age groups, population grew at a rate that closely matched the total population growth rate over the same period. A couple of differences are readily apparent. The first is the seemingly large amount of in-migration in the 85 years and older age group. The black dot in the negative range shows that more people in that age group died during the 1990s than were 75 or older and living in Whatcom County in 1990. This is possible by the effects of in-migration in this age group during the 1990s.”

Another notable change highlighted in the report is the increase in the number of 15-19 and 20-24 year olds. Not surprisingly, the report states that “The rapid growth of the 15-24 year old age groups illustrates the impact of growing enrollments at Western Washington University and other higher education institutions.”

- Employment - ECO’s summary report has a number of figures and tables to describe the distribution of jobs in the county in 2001, as well as data to show trends and projections in employment. Figure 2.51 shows how construction and resource related jobs were distributed in Whatcom County in 2001. This figure is one of a series in the report. Similar figures are provided for the different industrial sectors.

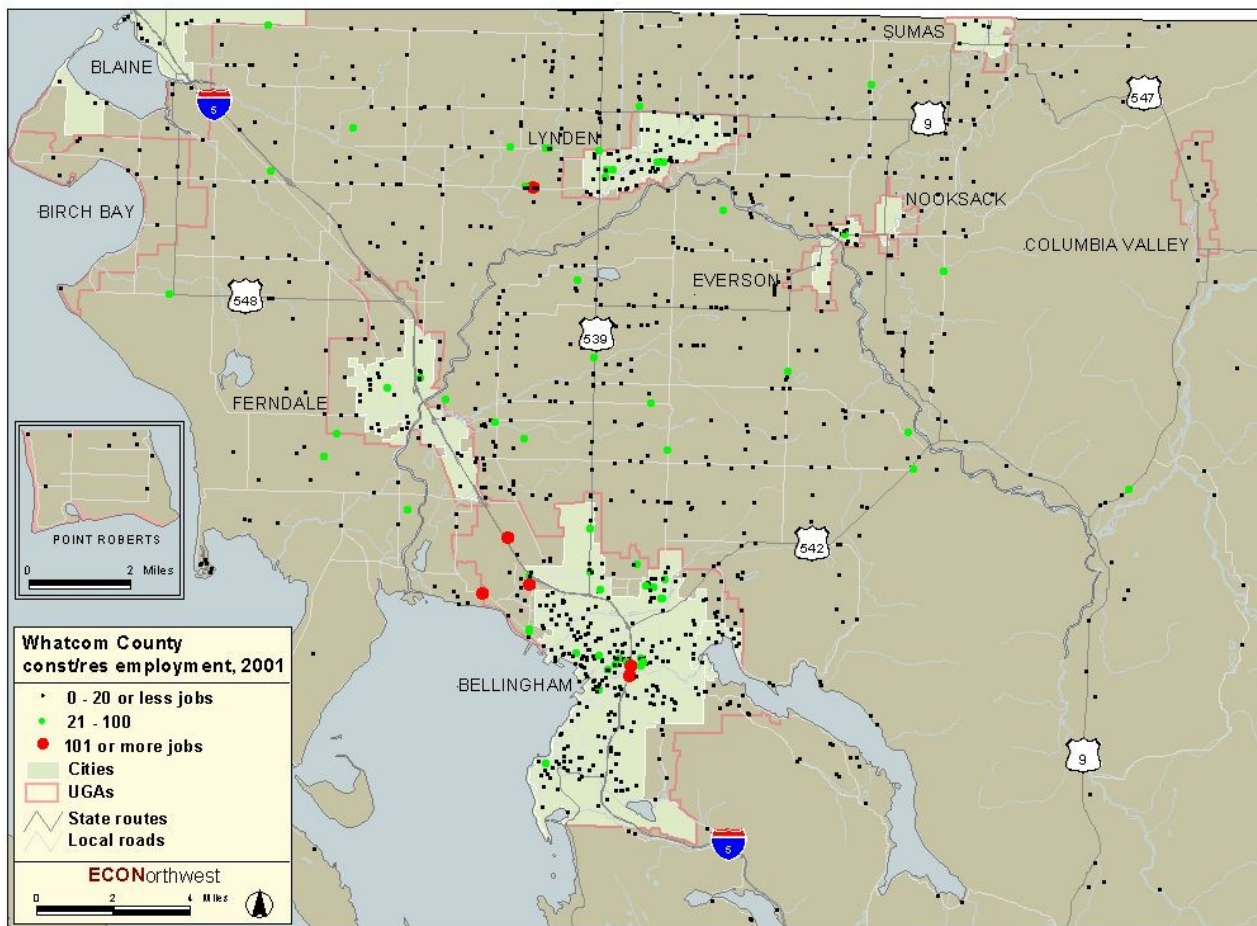


Figure 2.51: Whatcom County construction/resources employment distribution 2001.

As noted above, this presentation of employment data is unique. The employment distribution figures were created by ECO for Whatcom County in accordance with a formal data sharing agreement that allowed ECO to repackage confidential employment data. Table 2.7 shows the projected job growth by location and industrial category, as reported in ECO’s summary report.

- Sub-Basin Profiles - The economic summary includes separate profiles for three different sub-basins within the WRIA 1 watershed. The three sub-basins are South Fork Nooksack, Ten Mile, and Lynden North. Figure 2.52 is taken from

Table 2.7: Projected Job Growth 2001-2022

	Industrial	Commercial	Retail	Total
Bellingham	7,208	21,677	10,385	39,270
Blaine	438	1,113	352	1,903
Everson	184	23	40	247
Ferndale	734	1,079	744	2,557
Lynden	650	1,792	1,036	3,478
Nooksack	12	6	31	49
Sumas	140	31	27	198
ColumbiaValley	2	40	107	149
PointRoberts	27	69	110	206
BirchBay	21	379	78	478
OtherUninc.	4,453	2,062	820	7,335
Total	13,869	28,271	13,730	55,870

ECO's summary report and shows the three sub basins of interest. Two of the three sub-basins (Lynden North and Ten Mile) include some land that falls within a city limit. The Lynden North sub basin also extends across the county line into Lower Mainland British Columbia.

The ECO report provides short profiles of population, land use, and economic activity in the different sub-basins. It also shows the allocated population and employment for 2000-2022 for the different sub basins, along with information on population and employment in the relevant portion of British Columbia.

- Other Information - Appendix A in the summary report shows population, number of households, and employment by drainage area in Whatcom County. Separate tables also show population and employment forecasts by drainage area.

Appendix B in the summary report provides information on water use for individuals in different water user categories. The different categories include various industrial

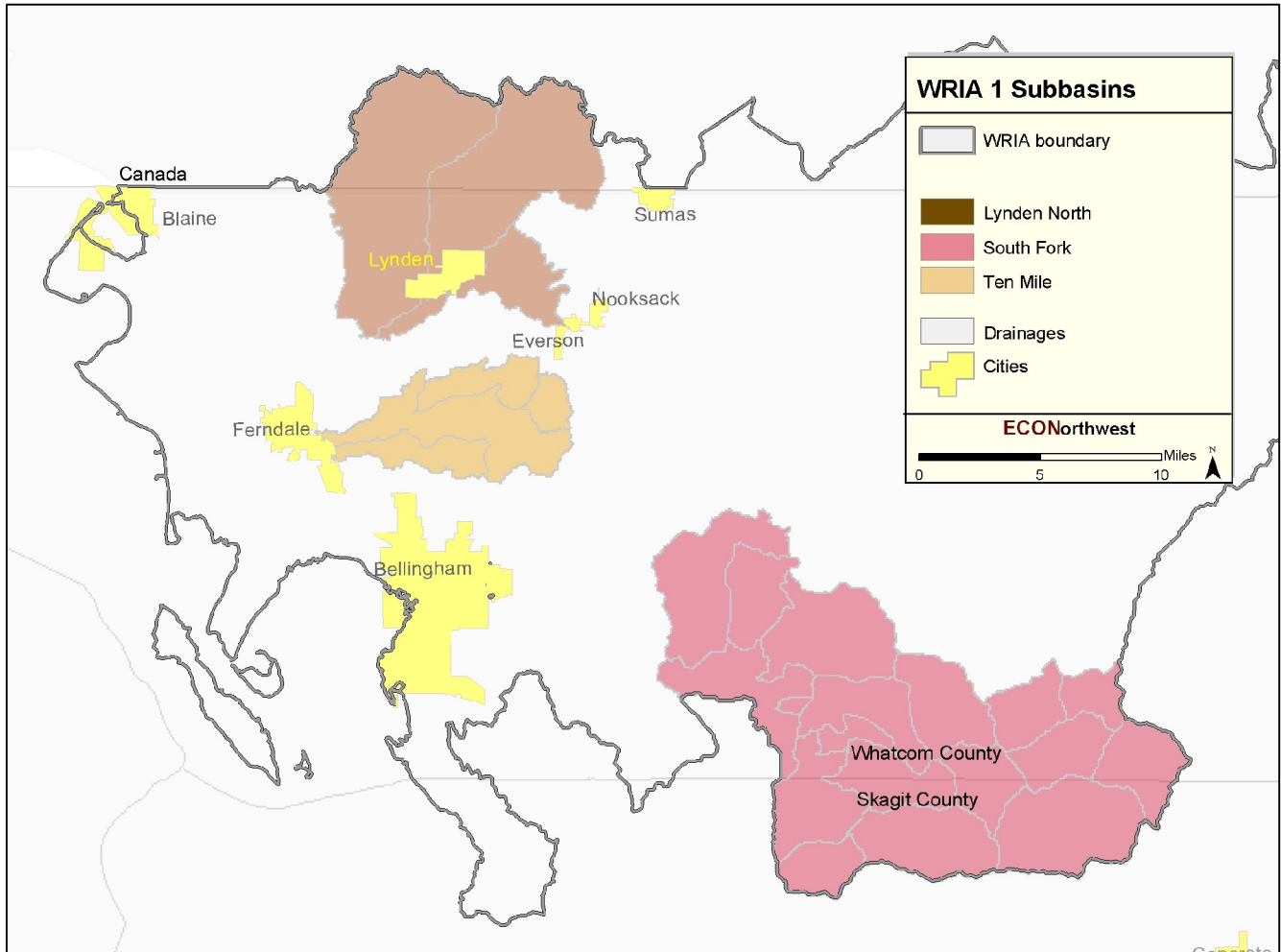


Figure 2.52: Sub-basins of interest in the WRIA 1 planning process.

categories, education (with water use per student), and residential (with water use per household). The purpose of the water use information is to show how changes in allowed water use or water availability might translate into changes in employment or land use. Since employment impacts were to be modeled in the WRIA 1 process using an input-output model and to include references to traditional industrial sectors, some attempt was needed to show water use per employee in the different sectors so that the impacts on employment could be estimated due to a project that changed water availability. For example, any estimate of employment impacts associated with a new water delivery system would require an estimate of water use per employee in

the affected sectors. Similarly, estimates of water use per household and water use per student are needed to assess the impact on different land uses (such as residential housing and location of schools). As noted in the report:

“One clear imperative for providing water use estimates is that the process should work well with the economic impact analysis. Since the impact analysis deals with the potential shifting of jobs and people from drainage to drainage, the best method for estimating water use is to calculate estimates of water use by job and person. Obviously, some jobs require more water resources than others; so having a process that allows for differences among job types (especially at the sector level) is also desirable. Finally, some drainages will have activities with unique water use characteristics that can be accommodated by this process (the Cherry Point industries, for example).”

Table 2.8 summarizes the water use information provided in the Task 3.2 Water Use Memo.

Table 2.8: Water Use By User Group

Category	Water Use (gallons per day, per worker or per person)
Residential	88.0
Construction	15.0
Education	76.9
Finance, Insurance, and Real Estate	15.0
Government (Non-Education)	15.0
Manufacturing	42.7
Retail	15.0
Services	15.0
Transportation and Public Utilities	15.0
Wholesale	15.0

These figures provide the foundation for converting changes in water supply that might occur with a given management alternative. It is important to note that these data may need to be updated with additional research.

- Assessment of Non-Market Goods and Services

The report on Non Market Goods and Services (NMGS) provides the following items:

- Definitions and explanation of concepts;
- A list of NMGS that may be affected by management alternatives within the watershed;
- An overview of methodologies used to analyze impacts on NMGS; and
- Recommendations for additional work related to NMGS in WRIA 1.

The discussion on the nature of NMGS offers definitions for the different types of value considered in the analysis of NMGS, as well as other terms and concepts.

The list of non-market goods and services was prepared with input from WRIA 1 Project participants. It includes natural resources, environmental services, cultural practices, and other items of interest or concern to participants in the WRIA 1 process. The fundamental purpose of the list is to help ensure that these items are included in any subsequent analysis of watershed management alternatives.

The initial draft list of NMGS was submitted to WRIA 1 participants in order to solicit their feedback. The list was distributed and discussed at various meetings, and was distributed via e-mail to participants who were not at the relevant meetings. (The list was distributed and discussed at Staff Team and Planning Unit meetings. In addition, a representative for each caucus was contacted to make sure that everyone had the chance to contribute to the list.) The list was modified based on the feedback CEBR received from a number of participants. The modified list was then redistributed to WRIA 1 participants for further comment, and discussed at subsequent meetings. The final list is included in the report on NMGS.

The NMGS report explains the various methodologies that could be used to quantify impacts on NMGS from water resource management alternatives. The methodologies covered in the report include revealed preference techniques, imputed value techniques, and stated preference techniques.

The revealed and imputed preference techniques, estimate values of NMGS based on observable behavior. For example, people reveal something about the value they place on certain NMGS when they purchase a house (paying more for homes with certain amenities such as a nice view) or travel to a particular recreation area (paying in travel time for a particular activity). Communities also reveal part of the value of natural systems through expenditures on manmade systems that perform similar functions as the natural systems.

The stated preference techniques involve directly asking individuals to state their willingness to pay for specific quantities of or change in certain NMGS. The most well known of these techniques is the contingent valuation method includes the use of surveys and focus groups.

The report on NMGS includes a discussion of the reliability of the different methods and a range of cost for implementing the recommended approach. It also provides a series of recommendations for future work. The recommendations made include:

- Conducting a quantitative analysis of NMGS in WRIA 1 and that the analysis be based on the contingent valuation method, possibly in conjunction with other techniques such as the revealed preference techniques;
 - Developing a RFP for future valuation work; and
 - Completing preparatory work prior to the release of an RFP.
- Socioeconomic Reports

The purpose of this report was to provide an overview of all of the socioeconomic work conducted for the WRIA 1 Project. Included in the report is a description of how the various other reports relate to each other, an overview of the general

approach for evaluating socioeconomic impacts, and a summary of what is included in each of the reports. This overview report was intended to provide the basic socioeconomic information that would be included in the WRIA 1 Phase 1 Watershed Management Plan. As noted previously, the report was used for that purpose and much of the information provided in this section came directly from that report.

- Long Term Data Collection Protocol and Summary of Methodology

The Task 3.5 Data Collection Protocol report describes the data that need to be collected to support a socioeconomic impact analysis and offers recommendations regarding the collection of those data.

Many different types of data needs have been recommended for water quantity, water quality, instream flows, and fish habitat. Examples include land use and land cover, precipitation, evaporation, inventory of all stream segments that provide habitat functions; determine areas of spring fed wetlands and small tributary fish spawning/rearing areas, analyze and map geology, hydrology, and related habitat functions.

Next Steps

As noted previously, the socioeconomic work conducted to date provides the roadmap for conducting a comprehensive cost-benefit analysis for water resource management options that may be considered in the future. In order to conduct such an analysis additional work will be needed.

2.3.3 Local Perspectives

Understanding local perspectives and interests is critical in developing a management plan that both meets the requirements of the Watershed Planning Act, and addresses unique local concerns. Section 2.2 described the approach used in the WRIA 1 Project to identify local perspectives and concerns. The purpose of this section of the Watershed Management Plan is to provide an overview of the local concerns and issues.

Perspectives are divided into four groups. The first group – common themes - provides perspectives and issues common to all four WRIA 1 Project elements (water quantity, water quality, instream flow, and fish habitat). Included in these common

themes are perspectives related to data management, public involvement and education, management actions, and funding. Perspectives on the remaining three groups - water quantity including instream flow, water quality, and fish habitat - follow the common themes. In examining the perspectives, there are two key points to keep in mind:

- This is an overview of the concerns identified by many individuals and groups throughout the duration of the WRIA 1 Project. The intent is to capture as many of the major concerns as possible, but it is not all-inclusive. The supporting documents and activities described in section 2.2 should be examined to fully understand the issues and interests of the various parties; and
- It should not be assumed that all parties are in agreement with all statements (there was no attempt made to do so).

Common Themes

Data and Information Management

One of the common perspectives expressed for all components (water quality, water quantity, instream flow, fish habitat) was the need for an enhancement of data and information management activities. In particular, unbiased data and information is needed on which to:

- Assess problems, including when and where to collect information, what indicators and benchmarks should be used to determine if there is a problem (and equity in those benchmarks/standards), how the data are analyzed and reported;
- Identify the source of the problem including the relative importance of the factors contributing to the problem; and
- Evaluate which management actions have the greatest likelihood of success and to evaluate the effectiveness of actions taken.

Of additional importance is the ability to understand the level of uncertainty, probable error, and limitations of the methods/analysis used; and the importance of having a long-

term monitoring program capable of assessing status, trends, and effectiveness of management actions. Opportunities for research were also of importance.

Public Involvement and Education

Additional actions related to Public Involvement and Education (PIE) activities were important to a number of project participants. Some of the suggestions made included: building and maintaining clear channels of communication and good relations among participants and affected parties; enhancing education and awareness with regards to water rights, water quality, ground water, and fish; and emphasizing ethical stewardship. In addition, the need to identify WRIA 1 residents' knowledge and attitude about water issues and how this knowledge impacts science-based solutions was suggested.

Management Actions

A number of common themes were present regarding management actions for water quantity, water quality, instream flow, and fish habitat. Examples include the need for management actions and solutions to consider:

- Balance – For example, some participants felt a balance between meeting instream and out-of-stream demands is needed both now and in the future as additional growth occurs;
- Equity/fairness – For example, some participants felt compensation should be provided to affected parties;
- Socioeconomic Factors – Numerous factors were described including the need to maintain financial security, a vibrant local economy, rural cultural values, and the independence/function of members of a particular caucus (e.g., private well owners, non-government water systems, agriculture). In addition, management actions should consider a cost benefit analysis and pursue actions that result in the greatest benefit for the least cost;

- Performance Based - Some participants emphasized the need for performance-based actions that include measurable goals and timelines and enable their effectiveness to be evaluated;
- Transboundary Issues- Unique challenges associated with trans-border situations should also be considered; and
- Potential Side Consequences - Actions should also consider potential side consequences such as, what would happen if agricultural lands or forested lands were converted and replaced with some other land use such as residential/commercial development.

Other recommendations and perspectives emphasized the need to build on existing and previous efforts where appropriate, and to ensure coordination with other programs such as comprehensive land use/infrastructure planning, storm water programs, the Coordinated Water System Plan, and water system plans. Some suggested an emphasis on drainage-based management. In addition, a variety of perspectives were raised related to compliance. Some expressed the need to minimize regulations while others wanted fair and full enforcement. Some felt information should be provided regarding the consequences when compliance does not occur and the subsequent costs to the resource, others in the WRIA, and state. Particular challenges to comply were also identified with wetland and stream regulations provided as an example for small cities.

Funding

Perspectives provided that were related to funding emphasized developing a full array of funding mechanisms to sustain ongoing implementation of measures adopted in the Watershed Management Plan including monitoring and compliance. Some felt there was a need to maximize local control of resources and policies. Others felt there should not be too much water bureaucracy.

Water Quantity

Project participants provided perspectives on a number of different water quantity topics including particular problems and challenges, factors contributing to the challenges, and management actions.

One of the major issues identified was the need to have greater certainty in ensuring adequate water supplies to meet current and future instream and out-of-stream needs. Out-of-stream users expressing concern included a number of cities, public water systems, private wells, and agricultural users. Instream concerns included identifying if current legal requirements (existing legally established instream flows) are adequate for various fish species in different life stages, and how to make sure sufficient water is available to meet needs.

Some of the indirect effects associated with not being able to obtain a water right are an increase in the number of “exempt” wells – wells that do not have to obtain a water right permit. Some of these wells are installed within the service area of existing public water systems and concerns exist regarding their impacts on water quality and quantity.

Concerns were also expressed about drainage related issues such as storm water, agricultural drainage, and flooding. In some cases, too much water is present (e.g., flooding) – in other cases, too little water is present (e.g., low stream flows). Particular examples cited included challenges associated with draining land for agricultural purposes, changing the timing and intensity of storm water runoff associated with increased development and changing land use practices, and reducing flood damage to some cities.

A number of factors were identified as contributing to why there are water supply problems. The factors can be divided into two main categories - legal and physical. Included in legal considerations are: it is extremely difficult to get a new water right; the legal status of existing paper water rights is not clear (e.g., there are some water rights that have not been used for years and in reality no longer are valid; some water users are operating outside the requirements of their certificate); the legal interpretation of

hydraulic continuity has resulted in difficulty in using most ground water supplies in many areas of WRIA 1; the “use it or lose it” rule that made it difficult to conserve water as a means of providing for future/additional needs; and uncertainty associated with unresolved federal reserved rights (including tribal rights) and their impact on other users.

Physical factors that were identified included: the role and relative impacts of different users (e.g., private wells/small water users, actual amount of water removed vs. returned through for example recharge from septic systems); land uses/activities (e.g., stream flow alteration, forestry, mining, impervious surfaces); other considerations (drought, global warming); the amount of water actually used for out-of-stream purposes; and aquifers and hydraulic continuity (need for understanding of hydraulic continuity).

A variety of perspectives were provided related to management actions - some offered suggestions for particular actions, others expressed concerns about the side consequences associated with potential actions. Suggested management actions to address supply issues included: water transfers (e.g., from one farm to another); use of Bellingham water to supply other areas such as Lynden; reclamation/reuse; storage; pursuit of new water sources such as deep wells; mitigating adverse impacts of withdrawals by the modifying source, location, timing and rate of withdrawals; grandfathering in existing water rights; raising the limit for exempt wells (thereby providing for small farms and nurseries); declaring that all existing exempt wells have irrevocable water rights; considering regulating small businesses; and developing a hydraulic continuity standard that can be used throughout the WRIA for use in making water allocation decisions more practical/useable.

Suggested management actions to address drainage issues included: maintaining current dikes to prevent flooding of protected lands; considering gravel removal and bar scalping for flood management along with appropriate mitigation measures for fish habitat; and requiring incorporation of multi-tiered flood hazard meander limit determinations, which also create and maintain places adequate for lowland out-of-channel fish and wildlife habitat.

Other perspectives that were offered regarding management actions included: Tribal treaty rights should not affect private wells; private wells after 1986 should not be affected by instream flow requirements; management actions should consider impacts on existing water users/water right holders; impacts of ESA on supply and demand should be considered; solutions that allow change and growth; no meters (costs, levels and fees); wells are a part of property rights; disclosure on reality of permitting by DOE, will there be any and what happened since 1986 for private well exemption.

Water Quality

Project participants provided perspectives on a number of different water quality topics including parameters of concern, how to determine if there is a concern, the sources and/or causes of problems, impacts on beneficial uses associated with water quality problems, and management actions.

Particular parameters/constituents of concern were temperature (the South Fork and mainstem Nooksack River), pesticides, fertilizers, fecal coliform, mercury, nutrients, cryptosporidium, hazardous materials, biochemical oxygen demand, iron and manganese, gasoline, sodium, arsenic, nitrate and other constituents on the 303(d) list. Some of these were of concern to ground water (e.g., nitrate, arsenic), others to surface water, and some to both. Some were perceived to be of concern because they have been detected, others because they did not meet standards, some because there is not enough information to determine if they are a concern, and others because they pose a potential concern in the future.

Water quality constituents of concern were viewed as coming from a variety of sources both naturally occurring and those attributed to human activity. Such sources/activities included potential hazardous material spills, sewage discharge, storm water/activities associated with urban development, agricultural practices such as manure lagoons/spreading and pesticide use, forestry practices, former and current fuel storage tanks, dog waste, seafood processors, biosolid disposal, drought, global warming, saltwater intrusion and relic saltwater. Some felt that more information/work is needed to

identify the cause/source of water quality concerns and the relative importance of the source/activity. Some felt that more work is needed to determine if perceived sources were in fact real. Some potential sources (biosolid spreading) were identified as possible future concerns not present.

The impacts identified associated with constituents of concern included impairment to beneficial uses such as drinking water, shellfish, fisheries, swimming, human health, and ecological health /biota. Examples of particular types of impairment included increased treatment requirements/costs for drinking water supplies, the long-term viability of Lake Whatcom as a municipal water source, fisheries impairment, swimming safety, and shellfish harvesting restrictions and closures.

Management perspectives included suggestions for particular actions as well as the identification of particular areas for focusing activities and included: develop, implement, and enforce adequate storm water management systems capable of removing hazardous materials; working with the agricultural community to reduce nitrates and fecal coliform loading; implement and enforce adequate buffers comparing existing standards with those from other places in the US/world and determine the best. Suggested management actions include: estimating and enforcing TMDLs; use of diking/drainage/sub-zone best management practices; enforce existing requirements and develop additional measures; determine management actions to address temperature problems; public ownership; proper disposal of street sweepings and storm drain waste; open up Lummi River.

Fish Habitat

A variety of perspectives and concerns were raised regarding fish habitat. In general, topics included the identification of particular problems/issues of concern, the factors contributing to the problems, and recommendations and interests related to management actions.

Examples of the particular problems that were raised included the fear of extinction, loss of genetic diversity, imbalance of wild/native (naturally spawning) vs. hatchery fish,

inadequate natural spawning, inadequate flows, and reduced carrying capacity. Concerns were also expressed regarding the ability to measure success or lack thereof. Suggestions included measuring how many fish breed and migrate downstream (not just limited to fish that return home); ratio of smolts to returning adult spawners; baseline figures on fish entering Nooksack with follow-up measurements over the years; measure outgoing smolts; inventory insect populations.

Factors felt to be contributing to these concerns include habitat degradation through the alteration of stream systems, increased impervious surfaces, inadequate flows, land use impacts, passage blockages (culverts), lack of instream structures, and lack of vegetative cover. Harvest practices such as netting salmon on the river were also identified as a concern.

Suggestions made for management actions to address the concerns included stream course remediation activities such as ensuring adequate riparian vegetation²⁴, enhancing the morphology of stream beds, ensuring compliance with County regulations such as the Critical Areas Ordinance, restoring wetlands on forest lands, and preserving natural features. In addition, some supported a stewardship approach to habitat restoration. The need for a regular evaluation of habitat viability over time was also identified.

Other considerations and perspectives related to management actions included: giving credit/compensation for habitat improvements, considering impacts on diking and drainage practices (how to balance the need to clean ditches and support farming but not cause fish habitat problems – consider timing, access, permitting, and best management practices), obtain guidance from the County Citizens Advisory Committee on Salmon Restoration Projects prior to taking action under the Fish Habitat component of the WRIA Plan, and the need for realistic expectations for salmon re-habitation.

²⁴ There were a number of comments on what would be considered an adequate buffer, how they should be determined, how variable they may be, how they would be enforced, and ultimately how effective they are in habitat restoration efforts.

2.4 Overview of Technical Validation Process

As the various studies and reports have been conducted to support the technical assessment work, a strong emphasis was placed on ensuring the quality of the work conducted. Toward this end a detailed review process was established involving local WRIA participants and in some cases outside peer review. For reports and other similar deliverables, the process typically involved several steps:

- 1) A preliminary draft was received from USU and reviewed by that appropriate technical team;
- 2) Based on the comments received from the Technical Teams, USU revised the document and sent a “draft” document to the technical team for further review;
- 3) If appropriate changes had been made the technical team provided a recommendation to the Staff Team that the document be approved as “final”; and
- 4) The Planning Unit and ultimately Joint Board received the recommendation and were asked to approve the document.

Some work products were also subject to outside peer review and most of the Phase III work products will undergo an independent peer review prior to approval by the Planning Unit and Joint Board. The peer review process is described in more detail below. Memos and other similar documents generally underwent a shorter review.

Incorporating outside peer review into the process required both selecting the peer review panel and determining the deliverables that would be subject to peer review. An Ad Hoc Committee, composed of members from the Planning Unit and Initiating Governments, was established in 2000 to select the panelists. A list of over 30 potential reviewers was compiled based on suggestions from participants. These candidates were then evaluated against specific criteria that had been approved by the Planning Unit. Based on this evaluation candidates were selected for each of the following areas: water quantity, water quality, instream flow/fish habitat, and the decision support system. Both the Planning Unit and Joint Board then approved the proposed candidates.

The initial work of the peer reviewers was to provide a review of the USU Phase III Scope of Work. The primary focus of the reviewers will be on the Phase III products that are scheduled for delivery in 2005. WRIA 1 Technical Teams are evaluating the initial list of peer reviewers to determine if it needs to be updated to ensure that the previously selected peer reviewers have the expertise required to review Phase III technical products and to determine if they are still available. It is anticipated that there will be modifications to the list of adopted peer reviewers.

The following Phase III products are scheduled for peer review:

- Decision Support System - Many of the products associated with the decision support system will undergo peer review. The major components are listed below. Refer to the revised USU Phase III Scope of Work for specific details.
 - Database Update and Integration (Task 3.1)
 - Watershed Characterization Module (Task 3.2)
 - Data Visualization Module (Task 3.3)
 - Scenario Builder Module (Task 3.4)
 - Database Management System (Task 3.5)
 - Analysis Modeling System (Task 3.6)
- Surface Water Quantity – The surface water quantity deliverables from the USU Phase III Scope of Work that will undergo peer review are outlined below. For additional details, refer to the Scope of Work.
 - Preliminary Surface Water Quantity Beta Model and Documentation Package – Draft Report 1 (Includes: technical material related to defining calibration data sets and model parameters; summary descriptions of each model and any modifications made to the underlying model structures; detailed summary comparisons between predicted and observed model performance that specifically targets model uncertainty in terms of input data and model output results as assessed through the semi-quantitative

sensitivity analysis; explicit documentation on model-to-model communication in terms of data and time-step resolution; description of the range of uncertainty of data inputs and model parameters from the semi-quantitative sensitivity analysis) (Task 4.1)

- Draft users manual (Task 4.1)
- Draft report on analysis of scenarios (Task 4.2)
- Surface Water Quality – The surface water quality products that will be peer reviewed are listed below. For a complete description of the products, refer to the USU Phase III Scope of Work.
 - Preliminary Surface Water Quality Beta Model and Documentation Package – Draft Report 1 (Includes: technical material related to defining calibration data sets and model parameters; summary description of each model and any modifications made to the underlying model structures; explicit documentation on the water quality model-to-model communication in terms of data and time-step resolution; description of the range of uncertainty of data inputs and model parameters; and draft “user manual” for the DSS that focuses on development of scenarios and review of modeling results for the water quality components) (Task 6.2)
 - Beta version of the surface water quality models (Lake Whatcom and WRIA-wide)
- Instream Flow - The instream flow products that will be peer reviewed are listed below. For a complete description of the products, refer to the USU Phase III Scope of Work.
 - Calibrated hydraulic and habitat models and supporting documentation
 - Draft Basin Stratification Report (combined with Task 8.6 Extrapolation Report)
 - Draft Field Collection Methodology Report (and appendix to the combined Task 8.6 Extrapolation/Task 8.3 Stratification Report)

- Calibrated hydraulic and habitat model components contained within the DSS
- Draft Extrapolation Methodology Report

2.5 Report and Study Reference Guide

There were numerous reports, studies, and memoranda prepared as part of the technical assessment phase of the WRIA 1 Project and have been referenced throughout Section 2 of this WRIA 1 Watershed Management Plan – Phase 1. Many of these reports and studies were provided to WRIA 1 Project participants as they were developed. In terms of a long-term central repository, all of the project documents are located in the Whatcom County Water Resource Library and in some cases on the WRIA 1 website.

Appendix D provides a list of the current documents and studies that have been completed along with their location. This document should be considered a work in progress and will need to be updated as the Phase III assessment work is completed.

SECTION 3

WRIA 1 WATERSHED ACTION PLAN TO ADDRESS KEY ISSUES

3.1 Purpose

The purpose of Section 3 is to identify the initial solutions, actions, and alternatives for addressing the key issues identified in Section 2, and the requirements described in the WRIA 1 March 2000 Scope of Work. As noted in the March 2000 Scope of Work, the identification and evaluation of solutions requires an incremental/iterative process building upon recommendations from previous planning efforts and considering existing laws, programs, and other efforts. In addition, the Scope of Work notes that the following alternatives/solutions will be considered:

- Water Quantity – Increasing water availability through strategies that include but are not limited to conservation, water reclamation and reuse, voluntary water transfers, additional water allocations, and additional water storage and water storage enhancements including aquifer recharge and recovery.
- Water Quality – Developing a recommended approach for implementing the TMDL established for achieving compliance with water quality standards unless a TMDL process has begun in the WRIA as of the date the watershed planning process is initiated under RCW 90.82.060¹. In addition, explore options to manage groundwater quality.
- Instream Flow – Aside from establishing or modifying existing instream flows, no specific strategies are specified in the Act for meeting the goal of ensuring that water is available in sufficient quantities to satisfy the minimum instream flows for fish.

¹ It should be noted that the Department of Ecology has an established TMDL program in WRIA 1 for the lower Nooksack River and Johnson Creek watersheds, and they are developing a TMDL for Lake Whatcom. The emphasis of the WRIA Project with respect to these efforts has been one of coordination and support in terms of data collection.

- Fish Habitat – Coordinate and integrate analysis and assessment with other salmon recovery and management efforts.

The March 2000 Scope of Work also encourages the Planning Unit to identify and implement early action projects and activities that are likely to serve both short-term and long-term management goals and that warrant immediate financial assistance from state, federal, or local governments.

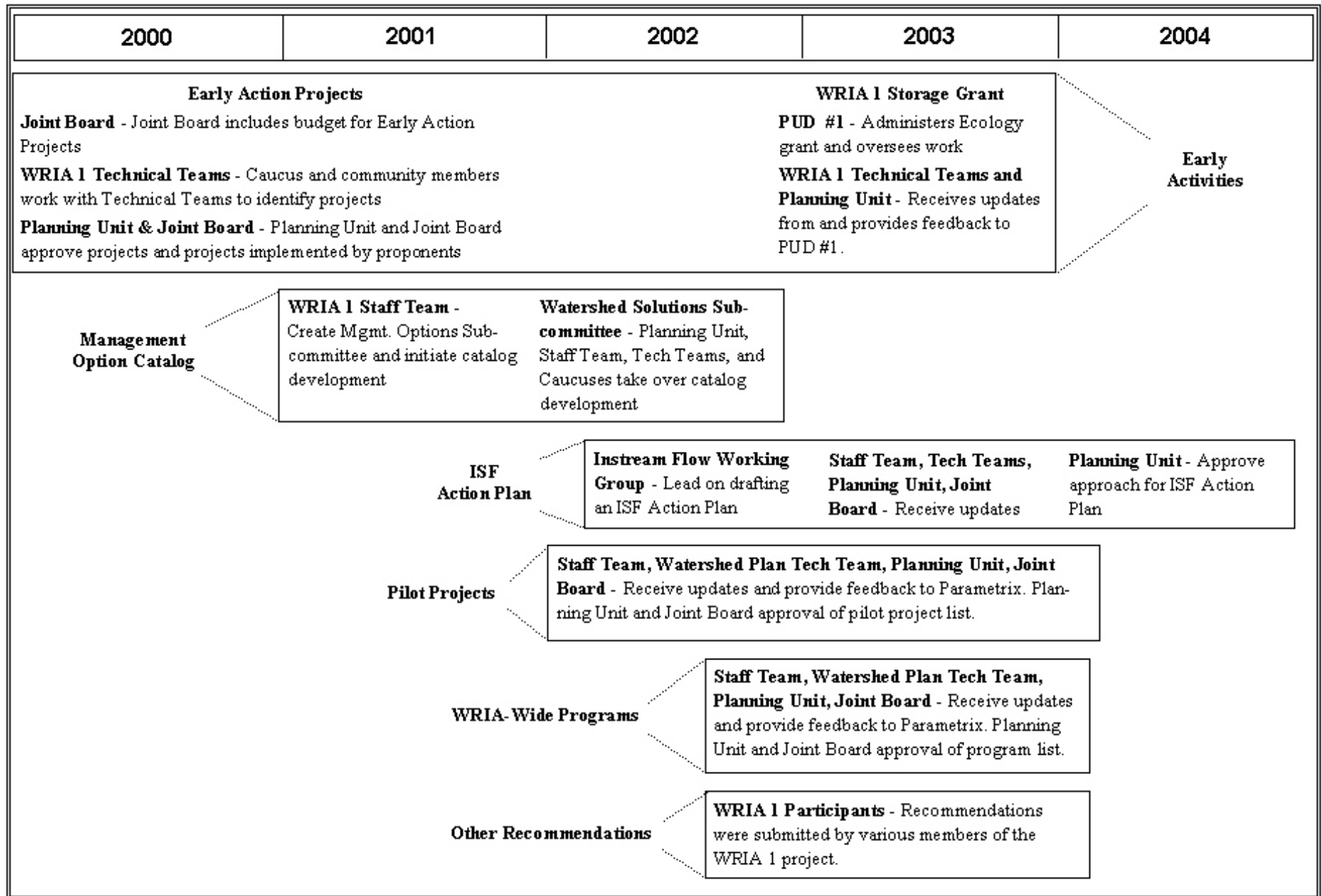
Finally, in evaluating the proposed solutions, the Scope of Work notes that specific criteria will be developed and used that consider project effectiveness, flexibility, potential side effects, equity, legal authority, permitting/approvals, cost/funding, administration/staffing, acceptability, and integration with related programs.

The remainder of Section 3 describes the approach, recommendations, and actions taken or under consideration for the WRIA 1 WMP- Phase 1 2005-2006 work plan to address the key issues identified in Section 2 and the March 2000 Scope of Work requirements and considerations.

3.2 Approach

As with the Technical Assessments element of the WRIA 1 Project, a variety of approaches and parties were involved in identifying initial solutions, actions, and alternatives for addressing the issues discussed in Section 2. The solutions, actions, and alternatives are represented in this section as Early Activities, the WRIA 1 Management Option Catalog, WRIA 1 Instream Flow Selection and Adoption Action Plan, WRIA 1 Pilot Projects, WRIA 1 Wide Programs, and Other WRIA 1 Recommendations. Figure 3.1 provides a general overview of the parties involved in each area of work and the relative timeline. The figure illustrates the interaction between WRIA 1 participants and the development of approaches for identifying actions and solutions to address WRIA 1 issues.

An initial approach was the result of WRIA 1 participants recognizing the need to identify actions and solutions that could be implemented early on in the process.



Therefore, while the Phase II Technical Assessment work was underway and before the Watershed Management Plan development was initiated, WRIA 1 participants began identifying actions and working out solutions that would help address issues in the WRIA 1 study area. The outcomes of these efforts have taken the form of “Early Activities”, a “WRIA 1 Management Option Catalog”, and the “WRIA 1 Instream Flow Selection and Adoption Action Plan”; all of which are described in detail in this section.

With regard to developing solutions and alternatives for the WRIA 1 Watershed Management Plan, the original approach identified by WRIA 1 participants and Parametrix involved using the Decision Support System (DSS) to evaluate suites of management options both within specific geographic areas of WRIA 1 and throughout WRIA 1. This approach involved several different tasks including:

- Conducting a literature search and review of potential management options implemented in areas outside of WRIA 1 for potential application in WRIA 1;
- Participating in meetings with WRIA 1 participants to review, discuss, and screen potential management options for application in geographic areas within WRIA 1;
- Conducting workshops with WRIA 1 participants and interested community members to receive input on potential management options in Detailed Management Areas; and
- Participating in meetings with WRIA 1 participants to define suites of management options to evaluate using the DSS.

Revisions to Utah State University’s schedule for completing the DSS required that Parametrix modify their approach for identifying management options for the WRIA 1 Watershed Management Plan. This adjustment resulted in Parametrix working with WRIA 1 participants to apply the work completed as part of the original approach (bullets 1 through 4 above) to a process of identifying pilot projects that could be implemented in specific areas of the WRIA. In addition, the work completed to identify potential management options would be applied to identifying and developing water resource management programs that could be applied WRIA-wide. The outcomes of these efforts were included in the March 2004 Preliminary Review Draft WRIA 1 Watershed

Management Plan- Phase 1 as two types of activities: WRIA 1 Pilot Projects and WRIA-Wide Programs.

The third approach taken to identify actions, solutions, and alternatives for addressing issues in WRIA 1 involved WRIA 1 participants submitting projects or programs for consideration in the WRIA 1 Watershed Management Plan. WRIA 1 Staff Team members modified the management options catalog template for use by WRIA 1 participants to describe their recommendations. The outcome of this effort was also included in Section 3 of the Preliminary Review Draft WRIA 1 Watershed Management Plan under the category of “Other Recommendations.”

Finally, recognizing the linkages between WRIA 1 issues and the Lake Whatcom Watershed, WRIA 1 participants agreed that it was essential that the existing Lake Whatcom Watershed Management Program and its status be described in the WRIA 1 Watershed Management Plan. The description is included in this section under “Lake Whatcom”.

Based on feedback from WRIA 1 participants on the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan, modifications were made to the various recommendations. All of the proposed actions were evaluated in light of comments made by WRIA 1 participants and with respect to existing and anticipated resources for purposes of implementing actions. In most cases, the actions were phased to reflect a two year work period (i.e., 2005/2006 WRIA 1 Work Plan). In a few cases, actions were deferred for consideration in future work plans. In all cases, the evaluation was done from the perspective of having measurable actions that could be achieved within the 2005/2006 time frame and with the available or anticipated resources. The outcome of the effort is represented in this section of the Review Draft WRIA 1 Watershed Management Plan- Phase 1 while the 2005/2006 work plan is included in Section 5.

The remainder of Section 3 describes each approach – Early Activities, WRIA 1 Management Options Catalog, Instream Flow Selection and Adoption Action Plan, WRIA 1 Pilot Projects, WRIA-Wide Programs, Other Recommendations, and Lake Whatcom – in greater detail. This section also includes a description of the WRIA 1 Long Term Monitoring Program.

3.3 Early Activities

There are two elements to the Early Activities: 1) Early Action Projects and 2) WRIA 1 Multipurpose Water Storage Options Assessment. The Early Action Projects were funded through the WRIA 1 Joint Board and were implemented during the planning phase of the WRIA 1 Project. The WRIA 1 Multipurpose Water Storage Options Assessment was funded with a grant from the Washington State Department of Ecology and was an effort to identify potential storage projects that may be feasible as management tools in WRIA 1. Each of these efforts is described below.

3.3.1 Early Action Projects

The WRIA 1 Project participants agreed early in the WRIA 1 watershed planning process that if there were “on-the-ground” actions that could be taken to address known water quantity, water quality, instream flow, or fish habitat problems, these actions should occur as soon as possible. That is, the watershed management plan did not need to be developed in order to start fixing known problems. The Joint Board, in response to this general agreement, established a line item in the WRIA 1 budget for implementing projects qualifying as an “early action” project. A variety of potential projects were discussed in the WRIA 1 Technical Team meetings as having potential as an “early action” project. In response to the number of projects being discussed for funding, the WRIA 1 Staff Team developed an application form and project evaluation guidelines for the Planning Unit and Joint Board’s use in selecting the projects to be funded. Not all of the projects that were discussed in the Technical Team resulted in submittal of proposals. Of all the projects that were initially discussed, proposals were submitted for six of the projects for consideration as a WRIA 1 “early action” project.

3.3.1.1 Early Action Project Evaluation Guidelines

The Staff Team’s guidelines for evaluating early action projects described a three-phase process. The initial phase of review occurred at the appropriate WRIA 1 Technical Team and included the Team working with the project proponent to refine the proposal. The second phase involved review by the Planning Unit with a recommendation to the

Joint Board for approval and funding. The final phase involved the Joint Board deciding project funding.

There were six guidelines to be used during the review process. In summary, the guidelines included:

- Was the project proposal application complete?
- Did the proposed project effectively address a known water quantity, water quality, instream flow, and/or fish habitat problem in WRIA 1?
- Is the proposed project consistent with the WRIA 1 March 2000 Scope of Work?
- Is the proposed project technically sound?
- Are the roles and responsibilities of the project participants clearly defined?
- Are there funding sources available to support the proposed activity other than the WRIA 1 Watershed Project funds?

3.3.1.2 Early Action Proposals

There were six proposals developed by WRIA 1 caucus members or community members for funding consideration as an “early action” project. Four of the six proposals were withdrawn during the first two review phases. The remaining two proposals were submitted to the Joint Board for funding as part of the final phase of review.

A brief description of the proposals that were not funded as early action projects and the reason that they did not reach the final review phase (i.e., funding) is provided below. Following the brief descriptions of the non-funded projects is a description of the proposals that received funding as a WRIA 1 Early Action project.

- Cover/Relay Crop and Report Card Testing – This proposal was submitted by the Whatcom County Agriculture Preservation Committee (WCAPC). The intent of the project was to proactively address ground water contamination from nitrate in agricultural areas in WRIA 1. The project was withdrawn by the WCAPC prior to formal submittal to the Planning Unit and Joint Board for

funding due to unresolved concerns associated with public access to data generated by project participants.

- Fecal Coliform Monitoring Proposal – This proposal was submitted by the Northwest Indian College (NWIC) and Washington State Department of Ecology. The intent of this proposal was to maintain continuity in the established data record by monitoring for fecal coliform bacteria at 14 locations during a nine-month funding gap anticipated by the NWIC. The proponents withdrew their proposal prior to submittal to the Planning Unit and Joint Board due to: 1) questions that were raised by Technical Team members as to whether the project met the WRIA 1 guidelines for early action project funding and 2) funding from a different source to bridge the monitoring gap was secured by the project proponents.
- Pledge Program for Residential Septic Maintenance/Volunteer Well-Monitoring – This proposal was submitted by the Washington State Department of Ecology. The intent of this public education project was to improve water quality by initiating change at an individual level. The proposal did not move beyond the first phase of review due to the lack of support by the WRIA 1 Water Quality Team. The reason the proposal lacked support was that it did not appear to meet the guidelines for funding as a WRIA 1 Early Action project.
- Data Collection for Pesticide Use Around Salmon-Bearing Streams – This proposal was brought forward by the Environmental Caucus and the Washington State Department of Ecology. The intent of the data collection for pesticides in salmon-bearing streams was to determine the extent to which classes of pesticides may be showing up in streams. This proposal did not develop beyond the first phase of review due to resource constraints of the proponents. The WRIA 1 Water Quality Technical Team agreed that aspects of the proposal should be considered in the drafting of the USU Phase III technical assessment work.

The two proposals that received funds as a WRIA 1 Early Action Project were *Repairing Sewer Lines and Manhole Problems as a Mechanism for Reducing Fecal Coliform Levels in Drayton Harbor* and *Tenmile Creek Watershed Volunteer Riparian Restoration Pilot Program*. Both of these proposals are described below.

Repairing Sewer Lines and Manhole Problems as a Mechanism for Reducing Fecal Coliform Levels in Drayton Harbor

Members of the Drayton Harbor Shellfish Protection District and the City of Blaine submitted this proposal for funding as a WRIA 1 Early Action Project. The intent of the project was to make repairs to documented problems in manholes and sewer lines in the City of Blaine's sanitary sewer system along Marine Drive in Blaine. In doing so, a potential source of fecal coliform contamination to Drayton Harbor would be eliminated. The repairs planned as part of this proposal were near Lift Station No. 1, which was one of the locations where elevated fecal coliform levels have exceeded water quality standards on a frequent basis. The commercial shellfish harvesting beds in Drayton Harbor were closed due to federal (National Shellfish Sanitation Program) standards for fecal coliform bacteria being exceeded in the Harbor. Repairing the known problems in the aging sewer system along Marine Drive was seen as one step in addressing water quality issues in Drayton Harbor.

The project proponents were requesting \$11,000 from the WRIA 1 early action budget. The remaining cash and labor support to make the repairs was provided by Washington State Department of Ecology's Coastal Protection Fund, Semiahmoo First Nation, Puget Sound Restoration Fund, City of Blaine, and Drayton Harbor Shellfish Protection District.

The Joint Board funded the project as a WRIA 1 Early Action project as recommended by the Planning Unit. The City of Blaine served as the lead entity for receiving the WRIA 1 funds and administering the project. A final report was submitted by the City of Blaine upon project completion. The project was reported to be a success in that all repairs identified in the proposal were successfully completed.

Tenmile Creek Watershed Volunteer Riparian Restoration Pilot Program

The proponents of this proposal included members of the WRIA 1 Agriculture Caucus and community member, Dorie Belisle. The intent of the project was to provide seed money for a volunteer riparian restoration program that involved farmers and other landowners in improving water quality in rivers, streams, and ditches running through their property. The specific goals of the volunteer program were 1) to improve water quality in the lowlands of Whatcom County by improving fish habitat while maintaining the ability to farm, and 2) set the stage for a two-year pilot program and to educate and engage Tenmile watershed residents in efforts to restore riparian areas on a watershed or sub-watershed basis.

Project proponents were requesting \$15,000 from the WRIA 1 early action budget. The Whatcom County Agriculture Preservation Committee, WSU Cooperative Extension- Whatcom County, Whatcom Conservation District, and landowners were providing additional project support in terms of cash, labor, or equipment.

The Joint Board provided the funding as a WRIA 1 Early Action Project as recommended by the Planning Unit. As outlined in the final report submitted by the project lead, the project was successful in involving farmers and landowners in understanding and addressing water quality concerns on a watershed basis. Tasks completed during the four-month timeframe included:

- A survey of landowners in the project area;
- Meeting individually with landowners to walk their section of the stream and discuss how land management decisions may influence water quality;
- Conducting neighborhood meetings to keep landowners updated on the project; and
- Developing education and information materials targeted at residents within the project area.

The tasks successfully completed under this WRIA 1 Early Action project set the stage for the next step of involving the landowners in riparian restoration, which occurred under a funding source separate from the WRIA 1 Project.

3.3.2 WRIA 1 Multipurpose Water Storage Options Assessment

The WRIA 1 Multipurpose Water Storage Options Assessment was a PUD No. 1 led effort funded by a Washington State Department of Ecology grant. Objectives of the project included compiling and reconsidering all of the storage options previously identified in studies or plans and to receive new ideas from WRIA 1 participants on storage options. The outcome of this task resulted in a listing of approximately 97 projects or sites categorized into eight water storage types: 1) Historic Proposed Dam Sites, 2) Existing Lake Modification and Small Pond Creation, 3) Floodplain Management and Restoration, 4) Hydrologic Restoration via Wetland Systems, 5) Drainage System Modifications, 6) Aquifer Storage and Recovery, 7) Water Supply Management, and 8) Water Demand Management. The general locations of the projects or sites were mapped, with varying degrees of accuracy, using a geographic information system (GIS). (Public Utility District No. 1, May 2003)

The second task in the effort included developing criteria and a scoring system to assist in selecting sites for further evaluation within the grant timeframe and budget. The selection criteria developed by the PUD No. 1 considered the following (Public Utility District No. 1, June 25, 2003):

- Any relevant criteria previously developed by Parametrix or WRIA 1 participants for management options or pilot projects,
- The local ranking process for applications for Salmon Recovery Fund Board, and
- The practical constraints of applying the criteria to diverse types of projects with varying levels of detail available.

The selection criteria were applied to the list of 97 as a first step in screening the list to a manageable size. The highest scoring projects in each category were identified resulting in a short list of 28 projects or sites for further consideration.

Once sites were screened, a single site – Bertrand watershed - was identified for further evaluation of storage options and/or approaches for improving low flows (Public Utility District No. 1, June 27, 2003). The Bertrand watershed was selected for the following reasons:

- There are known low flow problems in Bertrand Creek and its tributaries in the summer and early fall;
- Bertrand Creek is known habitat for five salmon species: Chinook, Coho, Chum, Pink, and Sockeye;
- There is unmet out of stream demand as demonstrated by the 60 pending water right applications;
- There is a potential implementation and funding structure in place via the formation of a Bertrand Watershed Improvement District (WID);
- There are site-specific projects with property owners that are willing to consider the project concepts and grant immediate access for site visits.

The types of storage options or improvements to low flows that were evaluated for sites within the Bertrand watershed included 1) wetland enhancements, 2) changing existing surface water diversions to ground water withdrawals, and 3) seasonal augmentation of surface water flows with ground water.

Other sites selected for further evaluation for feasible storage options in the WRIA 1 study area included Maple Creek and Landingstrip Creek. The rationale for selecting these sites was the presence of willing and cooperative landowners that would allow immediate access to the sites thereby ensuring the greatest chance of future implementation and success and the potential for the project to provide additional summer/fall stream flows and potentially increase water supply opportunities. Both of these sites were evaluated for low flow enhancement projects.

The PUD No. 1 retained Interfluve and Pacific Groundwater Group to assist with the evaluation of the project sites discussed above. The details of the evaluations can be found in the *WRIA 1 Multipurpose Water Storage Options Assessment* report on file in the Whatcom County Water Resources Division Library.

3.4 WRIA 1 Management Option Catalog

3.4.1 Purpose of the WRIA 1 Management Options Catalog

The WRIA 1 Management Option Catalog is the outcome of the WRIA 1 participants' efforts to document and describe potential management options for addressing water resource management issues identified through the WRIA 1 Project.

The Management Options Subcommittee, which was a subcommittee of the WRIA 1 Staff Team, formed in June 2001 to explore approaches for defining, reviewing, and recommending management options for consideration in addressing issues identified as part of the WRIA 1 Project. The approach recommended by the Subcommittee to the WRIA 1 Planning Unit was a three-step process that the Planning Unit subsequently approved. The steps included:

Step 1: Defining Initial Potential Management Options/Creating an Options Catalog;

Step 2: Evaluating the Potential Management Options; and

Step 3: Selecting and Implementing Management Options.

The Management Options Subcommittee initiated the first step - defining initial management options and creating a catalog - with the intent of making the Management Options Catalog a comprehensive source of potential management options for consideration in the WRIA 1 Project. Management options not pursued for the current iteration of the WRIA 1 Watershed Management Plan - Phase 1 remain in the catalog for consideration in future iterations. Additionally, as part of WRIA 1 Project implementation, there will be an ongoing effort to update the Management Option Catalog including providing a status of the options being pursued, adding new options for future consideration, and modifying language of specific management options as additional information is gathered.

3.4.2 Development of the WRIA 1 Management Options Catalog

The Management Options Subcommittee began developing the Management Options Catalog by reviewing management options recommended in studies and planning documents previously completed by WRIA 1 governments and others. A list of the recommendations with application to the WRIA 1 Project was compiled and circulated to

WRIA 1 participants for feedback. This initial list would later become the starting point of the Management Options Catalog.

Recognizing the need for consistency in how management options were described and entered into the WRIA 1 Management Options Catalog, the Management Options Subcommittee developed a template that included fields for 1) defining the management option, 2) identifying issues that it addressed, and 3) listing potential benefits and challenges associated with implementing the management option.

With Step 1 of the process underway, the Management Options Subcommittee disbanded and the Watershed Solutions Subcommittee formed to continue developing the catalog and to initiate Step 2 of the process: evaluating management options for consideration in the WRIA 1 Watershed Management Plan. Composition of the Watershed Solutions Subcommittee included some members of the Planning Unit, Staff Team, Technical Teams, and Caucuses.

The Watershed Solutions Subcommittee held a series of workshops to further identify and define management options and to begin identifying and evaluating potential options for inclusion in a WRIA 1 Watershed Management Plan. The workshops were structured so that there were workshops focused on management options with application across WRIA 1 and some with a focus on the Detailed Management Areas (refer to Section 2). Information from the workshops was recorded on the management option template and later entered into a Microsoft Access database developed by Public Utility District No. 1 project staff. The Management Options Catalog was then converted to html and posted to the Public Utility District No. 1 website (<http://www.pudwhatcom.org/WRIAMOCover.htm>) with links to the WRIA 1 Project website in an effort to obtain public input to the catalog.

Parametrix's effort to identify potential solutions to key WRIA 1 issues resulted in contributions to the WRIA 1 Management Option Catalog. Their contribution includes: 1) additional management options that could be added to the catalog database, and 2) expanding the template fields to improve the linkage between the management option and the Decision Support System (DSS) by identifying the type of data that will be needed by the DSS to evaluate the specific option.

The WRIA 1 Management Option Catalog will be updated on a regular basis as part of WRIA 1 Watershed Management Plan - Phase 1 implementation and will be considered as part of the long term implementation strategy (refer to Section 4).

3.5 WRIA 1 Instream Flow Selection and Adoption Action Plan

3.5.1 Background/Purpose

In the adopted March 2000 Scope of Work for the WRIA 1 Watershed Management Project, it was agreed that the existing established instream flows would be re-evaluated as part of the WRIA 1 Project. The reasons for doing so were described in Section 2, along with a description of the approach used to obtain the technical information necessary to support the evaluation. The purpose of the WRIA 1 Instream Flow Selection and Adoption Action Plan (ISF Action Plan) is to describe the proposed process for re-examining the existing instream flows and for selecting, determining achievability, adopting, and enforcing instream flow levels throughout WRIA 1. The plan includes information on how the technical assessment work would be used, what other factors would be considered, who and how various governments and the community will be involved, schedule, resource requirements, and the legal process used to formalize any recommended changes. The ISF Action Plan is an essential component in achieving the overall goal of the WRIA 1 Project - to have water of sufficient quantity and quality to meet the needs of current and future human generations, including the restoration of salmon, steelhead, and trout populations to healthy and harvestable levels and the improvement of habitats on which we collectively rely.

3.5.2 Developing the Instream Flow Action Plan

In May 2002 the WRIA 1 Watershed Management Project participants hosted an Instream Flow Selection Methodology Symposium, which brought together international, national, state, and local experts on the technical, legal, and political aspects of instream flow setting. In June 2002, the WRIA 1 Planning Unit supported the formation of an Instream Flow Working Group (ISF Working Group) to develop a WRIA 1 Instream Flow Selection and Adoption Action Plan for consideration by the rest of the WRIA 1 Watershed Management Project participants. The Joint Board appointed the ISF

Working Group, which is composed of representatives from the Initiating Governments (Whatcom County, City of Bellingham, Lummi Nation, Nooksack Tribe, PUD No. 1), Department of Ecology, and the Small Cities Caucus. Several iterations of a proposed ISF Action Plan were developed and presented to the Planning Unit and others for feedback. The current draft of the ISF Action Plan will be used as a guideline to implement Instream Flow Pilot Negotiations within WRIA 1. The information learned in the Pilot Negotiation process will be used to modify the ISF Action Plan over time. The latest draft of the proposed ISF Action Plan is attached in Appendix C. Similar to the entire WRIA 1 Watershed Management Plan, the current version of the ISF Action Plan will be used as guidance over the short-term and will be modified as more information becomes available and lessons are learned through implementation of pilot negotiations.

The underlying considerations used by the ISF Working Group to develop the ISF Action Plan were that to be successful, the plan must meet certain criteria. It must:

- Conform to Federal and State guidelines, statutory requirements, and other legal requirements for instream flows;
- Achieve the goals of the WRIA 1 Project;
- Be an approach that all parties are willing to accept;
- Is based on the best available science and a credible, scientific analysis of WRIA 1 instream and out-of-stream water users' proportionate impacts on flows, water quality, and salmonid life cycle and habitat use at a specific river or tributary reach;
- Include target flows that are sufficient to achieve specific healthy and sustainable fish populations at all life stages and meet ESA obligations, but also reflect the limitation posed by seasonal/annual variability in hydrologic and climate conditions. That is, target flows provide conditions conducive to viability of specific fish species and life stages in a variety of hydrologic conditions (e.g., the inter-annual variation in water availability resulting from annual variations in precipitation);

- Meet all water needs to the greatest degree possible, including reconciling the effects of meeting instream fish flow targets with legal, existing, and projected out-of stream uses and needs;
- Allow for maintaining a viable economy in WRIA 1 to the maximum extent practicable; and
- Recommend target flows that are physically and financially achievable to the maximum extent practicable consistent with legal requirements.

Similarly, the ISF Working Group concluded that to be successful, the action plan for adopting instream flows must:

- Provide reasonable certainty for both instream and out of stream users that water will be there for future operations and other related factors. (This will require keeping adequate records of use and maintaining water right records in a manner to facilitate enforcement of water law. The use of adjudication for existing water rights will be applied as negotiated);
- Define a clear process of what is going to happen and who is involved;
- Contribute to salmon recovery, a harvestable surplus of salmon, and also meet the requirements of the Endangered Species Act (ESA) with the goal that fish are delisted;
- Meet any applicable requirements of the Federal Clean Water Act (CWA);
- Include consideration of competing uses. (Note: By definition, recommended target flows include consideration of out of stream uses);
- Be acceptable to all parties;
- Have adaptability and flexibility to account for issues beyond local control such as climate, new information/ideas, changed factual circumstances, and important legal developments; and
- Recognize existing statutory and legal obligations (e.g., public health and safety and treaties between the United States and Indian Tribes).

On this point, it should be noted that subsequent to the March 2000 Scope of Work, representatives of the Lummi Nation devoted substantial effort to investigating federally-based processes and related legal mechanisms appropriate to the constructive resolution of their respective Federal/Tribal Reserved Water Rights and Treaty-Based Claims. As part of this effort, the Lummi Nation and Nooksack Tribe have worked closely with members of the Joint Board and Instream Flow Working Group to develop a federal negotiated settlement strategy capable of integrating and advancing both tribal and non-tribal objectives. The strategy proposes to use the ISF Working Group, as well as the Joint Board and Planning Unit, to support the efforts of federal, state, and tribal parties authorized to negotiate a settlement of tribal water right claims in WRIA 1. Such support could include Instream Flow Working Group and other WRIA 1 participants: 1) providing negotiators with appropriate technical assistance; (2) facilitating non-Indian community stakeholder input; and (3) developing the water resource management strategies necessary to meet the water supply needs of the tribal and non-tribal communities as determined by a final settlement agreement. The proposed plan is more fully detailed in the WRIA 1 Instream Flow Action Plan.

The ISF Working Group acknowledges that providing for finality and certainty may limit the extent that adaptive management can be incorporated as an approach for achieving adequate flows for all uses.

3.5.3 General Overview of Instream Flow Action Plan

The WRIA 1 ISF Action Plan is comprised of seven sections and three appendices. The Action Plan sections are:

- Section I - Introduction
- Section II - Lists the criteria used to evaluate the potential success of various approaches to selecting and adopting instream flow levels.
- Section III - Presents an overview of the recommended process and participants.
- Section IV - Presents the Recommended Instream Flow *Selection* Action Plan
- Section V - Presents the Recommended Instream Flow *Achievement* Action Plan

- Section VI - Presents the Recommended Instream Flow *Adoption* Action Plan.
- Section VII - Presents the Recommended Instream Flow *Enforcement* Action Plan

The three appendices to this Action Plan are:

- Appendix I – Definition of Terms
- Appendix II –Implications of Options Explored for Adopting Flows
- Appendix III- Federal Reserved Water Rights- The Negotiated Settlement Option (IIFWG, Nov 5, 2003)

3.5.4 Next Steps

Due to the complexity of the flow issues and the desire to begin making real progress on flow issues, the ISF Working Group proposed and the Planning Unit supported implementation of two Instream Flow Pilot Negotiations: the Bertrand and Middle Fork.

The pilot in Bertrand Creek is very important to the agricultural community and Whatcom County as it is an excellent example of a developed lowland basin that has been impacted by past land use activities and has a property owner base that is ready to take action. It also provides an opportunity to evaluate the effectiveness of the Watershed Improvement District approach to water resources management. Discussions by the initiating governments revealed that Bertrand Creek has relatively small impacts to flows in the overall Nooksack system and is expected to take more time to negotiate because of its complexity. Therefore, there is a strong desire to also begin discussions on the flow issues in the upper watershed starting with the Middle Fork.

The Middle Fork pilot negotiation is particularly significant to the City of Bellingham, the Lummi Nation, and the Nooksack Indian Tribe due to the potential size of the City's municipal water supply diversion and its unknown impacts on flows and fish habitat quantity and quality in the Nooksack river system from the point of diversion to Bellingham Bay. The diversion also affects the management of the Lake Whatcom system. Since the Middle Fork has a limited number of out of stream users with fewer negotiation participants at the table, it is anticipated that significant progress can be made in a relatively shorter time frame than the Bertrand pilot negotiation.

As presented to the Planning Unit in September 2004 the recommendation from the ISF Working Group is that the WRIA 1 Project:

- Continue work on the Instream Flow Action Plan and include the latest version in the WRIA 1 Watershed Management Project Plan (WRIA 1 Plan) as a working document that provides guidance to implementation of instream flow pilot negotiations that will be used to inform the continued work and implementation of the ISF Action Plan.
- Begin pilot negotiations in both Bertrand Creek watershed (initial funding approved) and the Middle Fork watershed (pending available funding) and expand these efforts to other basins if necessary to obtain clarity on the Instream Flow Action Plan.
- Craft a series of agreements between the participants in the pilot negotiations to maintain process clarity. The process will keep the Planning Unit or its successor informed of pilot and ISF Action Plan progress.
- Actively seek federal involvement in the process so that Tribal claims can be addressed and the overall conflicts over water allocation can be resolved.
- Upon evaluating the pilot negotiation processes, other sub-basin instream flow recommending processes can be initiated pursuant to whatever version of the ISF Action Plan is current at that time.

It is recognized that to be successful these pilot negotiation efforts need to be efficient efforts that provide ample communication opportunities to all interested parties. With this in mind it is expected that one of the initiating governments will take the lead and provide the staff support to move the pilots forward.

The proposed schedule for implementation of the ISF Action Plan begins in 2005 with initiation of the Bertrand and Middle Fork ISF Pilot Negotiations. Based on what is learned through the pilot negotiations, the ISF Action Plan may be revisited in two years prior to its being implemented WRIA-wide. The overall goal is to complete the ISF Action Plan implementation by 2010. The ability to realize this schedule is contingent upon obtaining resources to conduct the work. Currently, funding sources for the two

ISF pilot negotiations have been either secured or potential sources identified. These sources include a secured contribution from Whatcom County in the form of a supplemental budget allocation of \$159,900 for the Bertrand ISF pilot negotiations. An additional supplemental budget allocation that has been secured includes \$120,000 and \$155,000 for the Bertrand Watershed Improvement District and Ground Water Model Development, respectively; both of which involve efforts and tasks integral to undertaking and completing the Bertrand ISF pilot negotiations. A potential funding source that has been identified includes a contribution of resources from the City of Bellingham for efforts associated with the Middle Fork ISF pilot negotiation. In addition, \$200,000 was provided in the Governor's 2004 supplemental budget to help resolve Lummi Nation water right claims and this funding is being used to provide legal facilitation services and to promote the re-activation of the existing federal water rights negotiation team.

3.6 WRIA 1 Pilot Projects

3.6.1 - Definition and Purpose

Pilot projects are research projects of a limited scale. They are intended to test the effectiveness of the most promising management actions in order to help determine if they could or should be expanded to help solve problems in other areas in WRIA 1. Pilot projects are also intended to serve as local success stories and to promote stewardship and public involvement of the local community in areas where they are being implemented. The WRIA 1 Pilot Projects in this section should not be confused with the ISF pilot negotiations discussed in Section 3.5.

3.6.2 Selection Process for Pilot Projects

The Watershed Plan Technical Team² (WPTT), with assistance from Parametrix, developed criteria for use in evaluating WRIA 1 Pilot Projects. The criteria, which were approved by the Planning Unit in February 2003, included three categories: Procedural

² The Watershed Planning Technical Team (WPTT) consisted of some WRIA 1 Staff Team members, other Technical Team members, and Planning Unit members. The charge of the WPTT was to participate in discussions with Parametrix as needed, provide feedback to draft documents, and make recommendations to the WRIA 1 Staff Team on plan related topics.

Criteria, Feasibility Criteria, and Substantive Criteria (Appendix E). The purpose was to assist WRIA 1 participants in selecting pilot projects for funding for instances where there were several projects under consideration and limited resources. Application of the criteria was intended for future submissions of Pilot Projects and not the current projects that the WPTT and Parametrix were in the process of identifying. Parametrix indicated that if resources allowed, they would test the criteria with Pilot Projects being recommended for the WRIA 1 Watershed Management Plan – Phase 1. However, this did not occur given project timelines and available resources. Therefore, application of the criteria for evaluating Pilot Projects will begin with projects submitted for consideration after adoption of the WRIA 1 Watershed Management Plan – Phase 1. A process for considering new Pilot Projects and applying the criteria will need to be established by the WRIA 1 participants as part of a future work plan for Watershed Management Plan – Phase 1 implementation.

With regard to the preliminary review version of the WRIA 1 Watershed Management Plan distributed in March 2004, the process for selecting Pilot Projects involved a series of meetings between Parametrix, the WPTT, and interested caucus and community members. Based on their understanding of the key issues, Parametrix prepared a list of twenty potential projects with a short description for eight of the projects that, based on earlier feedback from WRIA 1 participants, appeared to have the greatest likelihood of success in being implemented in the first year of WRIA 1 Plan implementation. After considering the list of pilot projects, WPTT members and others suggested additional projects for consideration as Pilot Projects. Discussion and feedback between Parametrix and the WRIA 1 participants including the WPTT, Staff Team, and Planning Unit resulted in a prioritization of the list of Pilot Projects. Once the list of projects was prioritized, the process involved Parametrix working with the WPTT to develop preliminary design descriptions for the top projects including E. Hemmi Neighborhood Wetland and Stream Restoration, Ground Water Augmentation of Streamflows, and Low Impact Development. The Comprehensive Irrigation Management District Pilot Project remained a high priority. However, the proponent of the Pilot Project – Whatcom Agriculture Preservation Committee – was the identified lead for developing the design details. The intent was to incorporate the CIDMP Pilot

Project into the Preliminary Review Draft WRIA 1 Watershed Management Plan once the description was completed.

The Preliminary Review Draft WRIA 1 Watershed Management Plan was distributed to WRIA 1 participants in March 2004 for review and comment. Based on input received, modifications have been made to the pilot project designs. The pilot projects included in this Review Draft WMP reflect these modifications.

3.6.3 WRIA 1 Pilot Project Recommendations

There are four pilot projects recommended for inclusion and implementation in the Review Draft WRIA 1 Watershed Management Plan –Phase 1: Drainage Based Management (formerly Comprehensive Irrigation District Management Plan); E. Hemmi Neighborhood Wetland and Stream Restoration; Ground Water Augmentation of Streamflows; and Low Impact Development Facility and Road Pilot Projects: Whatcom County Facility and Road Projects and Guide Meridian Road Project (formerly Whatcom County Low Impact Development Facility and Road Projects).

An overview of the recommended pilot projects follows and includes a project description, performance measures, resource needs, schedule, lead entity, and other involved parties. In addition, each project includes the original project design concept as background for consideration in future WMP or project updates. A summary table of all of the WMP recommendations and lead entities is included in Section 5 as part of the WRIA 1 WMP 2005/2006 work plan.

- ◆ Drainage Based Management (Formerly Comprehensive Irrigation District Management Plan)

The purpose of the Drainage-Based Management Program is to evaluate the effectiveness of using drainage-based management strategies for systematically and holistically addressing water quality, water quantity, and fish habitat issues in specific basins. The initial focus for the Drainage-Based Management pilot project is the Bertrand and Tenmile watersheds, respectively. In the Bertrand watershed, drainage-based management will be evaluated using the recently established Watershed Improvement District (WID). In the Tenmile watershed, drainage-based management

will be tested using a watershed steward-based approach. These drainage basins will serve as a focal point for implementation and coordination of other WRIA 1 related programs including the instream flow pilot program in Bertrand Creek described in Section 3.5. Both of these projects are being promoted and pursued by other entities (e.g., watershed steward in Tenmile and WID in Bertrand), implementation of this project from the standpoint of the WRIA 1 WMP efforts in 2005 and 2006 is primarily limited to monitoring and reporting progress to WRIA 1 participants.

Rationale: The drainage-based pilot programs will help determine the degree to which drainage-based management strategies will contribute to solving WRIA-wide issues and whether WIDs, stewards, or some other strategy should be created to help solve problems in other watersheds. The program also promotes stewardship and public involvement by involving local residents in community based solutions.

Performance Measures: Performance measures for WRIA 1 participants will be limited to providing regular updates and progress reports to the Planning Unit. Participants in the drainage-based pilot project should define performance measures for the projects as agreements are obtained with WRIA 1 governments and project design elements are completed.

Public Involvement and Education: Public involvement and education activities will focus on providing updates and progress reports using avenues described in Section 4 – Governance and Implementation.

Program Resources: In addition to the contribution of time from project participants, funding for activities within these watersheds come from:

- Tenmile – Whatcom County 2004 supplemental budget; Washington State Department of Ecology Centennial grants; Public Utility District No. 1
- Bertrand - Whatcom County 2004 supplemental; Washington State Department of Ecology

WRIA 1 Project resources will be used to track progress within these drainage basins.

Schedule: Both programs have been previously initiated and progress will continue in 2005 and 2006. As part of the work program update, WRIA 1 participants will review progress and determine the next steps for implementing drainage-based management in WRIA 1.

Lead Entity: The Bertrand WID will be the lead for efforts within the Bertrand watershed. The watershed steward for Tenmile will be lead for efforts within the Tenmile watershed.

Involved Entities: Many other entities are now or are expected to be involved in implementing drainage-based management strategies within these two drainages. Examples include watershed residents, Conservation District, Nooksack Salmon Enhancement Association, Whatcom County, state, tribal, and federal agencies.

◆ E. Hemmi Neighborhood Wetland and Stream Restoration

Description: The purpose of the E. Hemmi Neighborhood Wetland and Stream Restoration pilot project is to create a healthy ecosystem, alleviate flooding over the E. Hemmi Road, add to WRIA 1 storage capacity by creating natural storage areas, and restore summer flows to Tenmile Creek through wetland and stream restoration. The location of the project is the upper Tenmile Creek Drainage on a reach of Tenmile Creek that extends from the confluence with Shuksan Creek to Tenmile Elementary School. Elements of the proposed E. Hemmi Neighborhood Wetland and Stream Restoration project includes: working with landowners on a preliminary project design; obtaining commitments from landowners for involvement in Conservation Reserve Enhancement Program (CREP) where appropriate; site engineering and excavation; site plantings; project outreach and education; project monitoring and reporting; and project maintenance. Since this project is primarily being promoted and pursued by Tenmile Watershed Stewards and other interested parties, implementation of this project from the standpoint of the WRIA 1 WMP efforts in 2005-2006 is primarily limited to monitoring and reporting progress to WRIA 1 participants.

Rationale: As with many lowland streams in WRIA 1, the reach of Tenmile Creek proposed for this project is a single channel lacking tree cover with the predominate vegetation on the floodplain being reed canary grass. Issues that may be addressed by the proposed pilot project include high “peaky” flows often associated with single channel streams in the lowland areas, seasonal low flows, intrusion of reed canary grass in the stream channel and flood plain, as well as high water temperatures and low dissolved oxygen levels.

Wetland restoration is identified as an option in the WRIA 1 Management Option Catalog. A number of benefits that may be achieved with implementation of this option include: 1) increasing the quality of fish habitat, 2) increasing percolation of surface water to ground water; 3) measured release of water to streams over time, 4) allowing interested landowners to participate in solutions to problems, and 5) increasing public and landowner education on wetland types and purposes.

Performance Measures: Performance measures for WRIA 1 Project participants will be limited to providing regular updates and progress report to the Planning Unit. E. Hemmi pilot project proponents should define performance measures for the project as agreements are obtained and project design elements are completed.

Public Involvement and Education: Public involvement and education activities will focus on providing updates and progress reports using avenues described in Section 4 – Governance and Implementation.

Program Resources: In addition to the contribution of time from project participants, resources will be needed for design and permitting, site excavation, project oversight and management (including project outreach and public education), and monitoring. NSEA has obtained funding to assist in implementation of the project.

Schedule: Initial organizational work has occurred with major implementation scheduled to begin in the summer of 2005.

Lead Entity: The lead for this pilot project is the Tenmile Watershed Steward with support from Washington State Department of Fish and Wildlife and Whatcom Conservation District.

Involved Entities: A number of parties will be involved in this project including landowners, Whatcom Agriculture Preservation Committee, Whatcom Conservation District, USDA Natural Resources Conservation Service, WSU Cooperative Extension, Whatcom County, Washington State Department of Fish and Wildlife, and the Tenmile Watershed Steward.

◆ Ground Water Augmentation of Streamflows

Description: The purpose of this pilot project is to identify and implement an approach for augmenting streamflows in low flow months by pumping ground water from wells. The most likely location for implementing this pilot project is the Bertrand drainage because of the recent formation of the Bertrand Watershed Improvement District (WID). It is recommended and anticipated that the Bertrand WID will implement this project either independently or in collaboration with the WRIA 1 Instream Flow Working Group as part of the Bertrand Instream Flow (ISF) Pilot Negotiations. The Bertrand ISF Pilot Negotiations is an element of the WRIA 1 Instream Flow Selection and Adoption Action Plan.

Project Rationale: Typically, during July, August, and September stream flows are low, including those in the Bertrand drainage, and/or do not meet the existing instream flow requirements. This is also the time of year that out of stream users have increased needs for water. Ground water augmentation is a management option identified in the WRIA 1 Management Option Catalog (Catalog Index WM9-1) and in the Bertrand Comprehensive Irrigation Management District Plan (CIDMP) as a possible solution for meeting both instream and out of stream needs. Implementing this pilot project will help provide information needed for determining the degree of effectiveness of augmentation as an approach for improving fish habitat, improving stream temperature, and providing immediate improvements to stream flows at key times of the year. The Bertrand area is identified as the likely location to implement this pilot project because of the shared water management responsibility created when the Bertrand WID was formed. This cooperative management of individual water rights will be necessary to jointly implement stream flow augmentation and achieve the desired instream flow levels. During 2005 and 2006, assuming that the pilot is

implemented by the Bertrand WID, the effectiveness of augmenting streamflows with ground water will be monitored and evaluated by WRIA 1 participants. The results of the evaluation will guide future implementation of this project in other areas of WRIA 1 as well as any modifications that should be made as part of future WRIA 1 Work Plans.

Performance Measures: Performance measures for the Ground Water Augmentation of Streamflow pilot project include:

1. Identify cooperative property owners within the Bertrand drainage;
2. Complete site evaluations and obtain agreements with property owners;
3. Develop the project specific scope of work that includes additional performance goals, a monitoring program, resource needs, and schedule; and
4. Evaluate implementation of the pilot project for other areas in WRIA 1.

If the Bertrand WID implements this pilot, it is anticipated that they would be responsible for the first three performance measures and that it would occur in collaboration with the WRIA 1 Instream Flow Working Group as part of the Bertrand ISF Pilot Negotiations. It is important to note, however, that the underlying legislation for watershed planning does not enable the WRIA 1 Project to obligate the Bertrand WID to implement this project. There are other agreements associated with funding and the Bertrand WID that are either in place or being developed that may influence the WID's ability to implement this pilot. The fourth performance measure is anticipated to be the responsibility of WRIA 1 Project participants. The evaluation will be used to draft future WRIA 1 Project work plans and/or WRIA 1 Watershed Management Plan amendments. In the event the Bertrand WID is unable to implement this pilot, the evaluation will be used to identify and pursue an alternative location and lead for a ground water augmentation of streamflow project.

Public Involvement and Education: The Public Involvement and Education plan associated with Ground Water Augmentation of Streamflows in 2005 and 2006 is limited due to resource availability. The WRIA 1 Instream Flow Working Group and

staff providing support to the WRIA 1 Project will work together to provide the Planning Unit and their respective caucuses with progress reports using avenues described in Section 4- Governance and Implementation. The Bertrand WID or entities associated with the WID may choose to undertake a more focused and comprehensive P.I.E. effort as part of their programs. If additional resources are identified or become available to the WRIA 1 Project, the P.I.E. effort associated with implementing this pilot project by WRIA 1 participants will be re-evaluated and adapted to meet any identified additional needs.

Estimated Project Resources:

2005-2006 Resources

A detailed budget for implementing the Ground Water Augmentation of Streamflows will need to be developed when an approach for proceeding is identified and a scope of work drafted. The funding sources available to the Bertrand WID and WRIA 1 Instream Flow Working Group for implementing this project include:

- \$120,000 – Existing Funds - In 2004, the Whatcom County Council passed a budget supplemental that allocates \$120,000 for projects in the Bertrand and Tenmile watersheds. It is anticipated that a portion of that budget will be used for implementing a ground water augmentation of streamflow project in the Bertrand area.
- \$300,000 – Existing Funds - In 2004, the Governor requested and the state legislature approved a supplemental budget that resulted in the Bertrand Watershed Improvement District receiving a grant of \$300,000 from the Washington State Department of Ecology for implementing projects identified in the Bertrand Comprehensive Irrigation District Management Plan (CIDMP). One of the projects that have been identified in the CIDMP is an augmentation project. Therefore, it is anticipated that a portion of the state grant will be used for this purpose and will supplement the local funding from the Whatcom County Council's budget supplemental.

- \$15,600 – Resource Need - This estimated budget represents resource needs for the 2005-2006 work period for the following tasks: tracking and documenting project progress for purposes of preparing quarterly written updates for WRIA 1 participants and, in 2006, evaluating pilot outcomes and providing recommendations relative to project implementation, modifications, and/or resource needs for consideration in the next work plan period. Sources to consider for filling this need include using existing Initiating Government staff or budget, pursuing a Washington State Department of Ecology Watershed Planning Implementation Grant, and/or pursuing other grant resources.
- In-Kind Contribution – It is anticipated that the WRIA 1 Instream Flow Working Group members will provide feedback and/or participate in tasks associated with the ground water augmentation of streamflow pilot as part of the Working Group’s efforts in the Bertrand Instream Flow Pilot Negotiation process, which is an element of the WRIA 1 Instream Flow Selection and Adoption Action Plan. This involvement will not require new resources but will be performed under existing commitments by Working Group members.

Schedule: The schedule below is intended to reflect a general timeline for proceeding with implementation. Actual timelines may be influenced by a number of factors including but not limited to development of interlocal agreements, grant guidelines and deadlines, staff availability, and/or available budgets. The general schedule is also subject to acceptance of the recommendations or obligations by the identified entities or parties associated with this effort.

January - June 2005:

1. Bertrand Watershed Improvement District identifies an augmentation pilot project in the Bertrand drainage and develops a scope of work in collaboration with the WRIA 1 Instream Flow Working Group.
2. WRIA 1 Project staff monitors progress and prepare updates for WRIA 1 Participants.

June - December 2005:

1. Scope of Work developed above is implemented.
2. WRIA 1 Project staff monitors progress and prepare updates for WRIA 1 Participants.

January – December 2006:

1. Continue implementation.
2. WRIA 1 Project staff monitors progress and prepare updates for WRIA 1 Participants.
3. WRIA 1 Project staff draft recommendations for project updates and/or modifications for consideration in upcoming year(s) WRIA 1 Project work plan.

Lead Entity: The lead for initiating this pilot project is recommended to be the Bertrand Watershed Improvement District (WID). It is anticipated that initiation will occur as part of the Bertrand WID's efforts to address stream flows and water use at certain times of the year and that it will be done in collaboration with the WRIA 1 Bertrand Instream Flow Pilot Negotiations. As noted previously, the underlying legislation for watershed planning does not enable the WRIA 1 Project to obligate the Bertrand WID to implement this project.

The lead for tracking progress and reporting to WRIA 1 Project participants is WRIA 1 Project staff.

Involved/Interested Entities: The WRIA 1 Instream Flow Working Group members will have a significant role due to the relationship of the augmentation project as a management option that may be considered as part of the Bertrand Instream Flow Pilot Negotiations. Other parties likely to be involved or interested in the implementation of this pilot project include property owners, WRIA 1 Water Quality and Quantity Technical Teams, WRIA 1 Instream Flow and Fish Habitat Technical Teams, and WRIA 1 Planning Unit Caucuses.

Project Design Details for Consideration in Future WRIA 1 Project Updates:

The information outlined below reflects the original design concept outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan. It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that the inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

The original Ground Water Augmentation of Streamflows pilot project design has two primary components: 1) site selection, and 2) project design. Both components are described below.

Site Selection

In selecting the site for a streamflow augmentation project the following factors should be given consideration:

- 1) The willing participants are property owners with water rights that have a permitted use capable of being modified with authorization from the Washington State Department of Ecology Water Rights Division.
- 2) impairment to existing senior water right holders in the source aquifer will not occur,
- 3) The impact to fish from low flow conditions can be demonstrated through evidence such as presences of redds, juveniles, or spawning adults.
- 4) If ground water is used to augment streamflows, a water quality analysis should be conducted on the ground water to confirm that it does not have concentrations of metals, pesticides, and/or nutrients that will disrupt the ecosystem of the receiving surface water.

The hydrologic characteristics that make a watershed suitable for using ground water to augment stream flows are those where the smallest fraction of the ground water removed is actually derived from water already flowing instream, or from ground water that would discharge shortly to the stream. This is further described below.

1. Locations where surface water is infiltrating to ground water are unsuitable. This condition may be evaluated by measuring the hydraulic head difference between the stream flow and the shallow subsurface beneath the stream bottom or by measuring the stream flow upstream and downstream of the proposed project site.
2. Ground water wells selected for use in supplying augmentation water must be demonstrated to have the capacity to continue supplying ground water for the duration of the low flow season. Once initiated, pumping cannot be discontinued while instream flows are in deficit condition. Ground water pumped temporarily to augment stream flow, and then discontinued while low flow conditions persist, only results in depleted ground water discharge during later periods and even lower deficit instream flows. Ground water pumping must be continued until instream flows are restored due to precipitation runoff, or not initiated at all.
3. The potential for the water well supplying ground water for augmentation to impact water availability in nearby wells must be considered. Mitigation measures may be required. Impacts of mitigation measures on instream flows must be evaluated. All public ground water withdrawals must comply with RCW 90.44.050, which, with limited exceptions, generally requires a WSDOE-issued permit as a prerequisite to well construction and/or water withdrawal. Additionally, RCW 90.44.130 states that subsequent water appropriators may not impair the water rights of a senior water right holder.
4. Reduction of streamflow due to reduced ground water discharge from well pumping must be minimized. Low permeability streambeds (fine sediment substrate) are preferable for this reason. Maximum distance from pumping well to discharge stream location is preferable. Maximum watershed area up-gradient from the well location (providing a greater water supply source) is preferable.

5. Evaluate potential impacts to streamflow from well withdrawals using the single well application. Identify well locations and pumping schedules that would minimize impacts to instream flows.

System Design

The design of the ground water augmentation system will depend on the quantity of water necessary for instream flows and specific site characteristics. Stream flow measurements at the project site will be compared with the desired flow levels identified as part of the WRIA 1 instream flow efforts and reports to determine the deficit flow amount that needs ground water augmentation. Flow measurements will also be made during the augmentation period to evaluate if the pilot project is effective.

To establish the capacity of well(s) to provide adequate water for the duration of the project and how best to deliver the water from the well(s) to the stream channel the following site and well characteristics need to be known:

- Elevation of well(s)
- Non-pumping water surface elevation level in well(s)
- Elevation of streambed(s)
- Distance from the well(s) to the stream
- Topography of the land between the well(s) and the stream(s)
- Well(s) pump capacity
- Source aquifer hydraulic properties (transmissivity and hydraulic gradient)
- Potential impact of groundwater withdrawal on existing flow

With this information and the water quantity requirement the following can be determined:

- If one or multiple wells will be necessary to meet the water quantity requirements
- The method of delivery, whether water will have to be pumped to the stream channel or if it can be gravity fed

- Need for auxiliary pumps to convey groundwater to the stream, the size of the pump, if necessary
- The size and length of the pipe to the channel

A feasibility analysis will be performed upon those sites that most closely conform to the criteria described above. An analysis of the costs associated with the construction of the discharge conveyance system(s), the energy costs to pump and transmit the water, the deferred costs associated with water cut off from its permitted use; and the project benefits, including those attributable to non-market goods and services, will be prepared to evaluate project feasibility.

- ◆ Low Impact Development Facility and Road Pilot Projects – 1) Whatcom County Facility and Road Projects and 2) Guide Meridian Road Project

Description: The purpose of the two pilot projects is to reduce storm water impacts on water resources by:

- Evaluating the potential for use of Low Impact Development (LID) practices on Whatcom County properties and/or road projects and the Washington State Department of Transportation Guide Meridian road widening project. .
- Evaluating the effectiveness of LID practices to reduce storm water impacts.
- Demonstrating implementation of LID practices as storm water retrofits and new development Best Management Practices.
- Identifying challenges and impediments that, if addressed, would increase use of LID practices on public and private lands, which will be used to inform the WRIA-Wide Low Impact Development program.
- Develop/distribute educational materials so that others may learn LID concepts and apply these practices to their own projects.

The Whatcom County pilot project would be implemented in phases. The first phase would start with an evaluation of Whatcom County owned properties, future facilities, and maintained roads to determine which offer the greatest opportunities for

successful implementation. This phase would occur as part of the annual 6-year road program updates and capital facilities planning. The second phase would include design of the pilot project(s), including the identification of partners, costs, education program, and monitoring approach to evaluate success. The third phase would be to implement the pilot project(s) designed under Phase 2.

The Guide Meridian pilot project would be implemented as part of the Guide Meridian widening project that is already underway. Washington State Department of Ecology will work in concert with the Department of Transportation and WRIA 1 Project participants to provide updates and opportunities for feedback regarding the potential use of low impact development practices as the project proceeds.

Rationale: Storm water quantity and quality changes associated with development (including associated roads) is one of the factors contributing to adverse water quality, water quantity, instream flow, and fish habitat impacts in WRIA 1. The two pilot projects seek to address some of these concerns by pursuing and, as possible, implementing low impact development practices as part of the overall projects. Through implementation of these pilot projects, information will be gained about the use and challenges associated with low impact development that could inform future actions on the WRIA Wide Low Impact Development Project.

Performance Measures: At a minimum, a progress report that includes status of and assessment of actions taken and any low impact development practices incorporated, will be provided related to both projects. Additional details on performance measures will need to be considered depending on the nature of the activities that may be implemented.

Public Involvement and Education: Public involvement and education activities will focus on providing updates to the Planning Unit and their respective caucuses with progress reports using avenues described in Section 4 – Governance and Implementation.

Program Resources: No resources are being sought from the WRIA 1 Project to implement either pilot project at this time.

Schedule: Whatcom County will seek to identify one or more possible projects upon adoption of the WRIA 1 Watershed Management Plan and in coordination with the schedule for annual update of the 6-year road program and capital facilities planning. Specific details regarding the project schedule will need to be developed once/if a project is identified and will depend upon the nature of the project. The Guide Meridian Project is phased project – input from WRIA 1 participants will be integrated as possible into the existing schedule.

Lead Entity: Whatcom County will be the lead for the County facility and/or road project. The Washington State Department of Ecology will act as lead liaison between Washington State Department of Transportation and WRIA 1 Project participants on the Guide Meridian widening project.

Involved Entities: The Whatcom County pilot project will likely involve staff from various County divisions as well as outside consultant support although this will ultimately be determined once/if a likely project is found. As noted previously, input from the WRIA 1 Project participants will be sought for the Guide Meridian pilot project.

3.7 WRIA 1 Wide Programs

3.7.1 Purpose

WRIA-wide programs are defined as programs that have application throughout WRIA 1 with the purpose being two-fold: 1) to improve the effectiveness of existing water-related programs, and 2) to identify new programs that fill water resource management needs not currently being met. WRIA-wide programs identified for consideration in the WRIA 1 Watershed Management Plan – Phase 1 also need to be consistent with and help meet the approved goals of the WRIA 1 Project as described in the March 2000 Scope of Work.

3.7.2 Selection Process for WRIA-Wide Programs

The process for selecting WRIA-Wide programs for inclusion in the WRIA 1 WMP involved a series of meetings between Parametrix and the WRIA 1 Watershed Plan Technical Team (WPTT). The approach included identifying potential programs that met

the overall goals of the WRIA 1 Project and that addressed key WRIA 1 issues. Once potential programs will identified, the next step included listing related programs that already existed or that were planned. Identifying the known existing or planned programs would help ensure that the WRIA 1 Project complied with requirements of the Watershed Planning Act.

The list of recommended WRIA-Wide Programs resulting from the meetings between Parametrix and the WPTT included: Natural Resource Policy Integration, Compliance, Water Use Efficiency, Water Use Tracking (initially titled Water Policy Program), and Public Involvement and Education. The WRIA 1 Planning Unit approved the list of programs in February 2003 with the understanding that the PUD No. 1 would take the lead on drafting the content for the Water Use Tracking Program since many of the elements of the program were based in part on previous suggestions for legislative action. As a result, Parametrix and Whatcom County staff conducted no additional work on the Water Use Tracking Program. The Planning Unit's approval was granted with the understanding that the approval did not extend to the content for the listed programs and that as part of the Watershed Management Plan's internal review process the Planning Unit would have opportunities to comment on and discuss the programs' content.

To develop the content of the WRIA-wide programs, Parametrix recommended conducting facilitated workshops with representatives of the parties that would potentially be affected by program implementation. Given budget limitations, workshops could only be conducted for two of the programs. The WPTT recommended to the WRIA 1 Staff Team and the Planning Unit that the Natural Resource Policy Integration and Compliance programs be targeted for the workshops. The basis for the recommendation was that the intent behind these programs was to ensure integration, coordination, and/or collaboration of elements of existing programs and the numerous local, state, and/or federal entities involved. Parametrix worked with the WPTT to develop program concept papers and participant lists for the two workshops. Whatcom County Water Resources staff used a similar process to organize and facilitate a workshop with local educators to develop the program content for the Public Involvement and Education Program.

A WRIA 1 participant later submitted a final program – Low Impact Development (LID) – to the list of potential programs. It was initiated by discussions at the WPTT meetings and the inclusion of a LID Pilot Project and the fact that many of the attributes of LID had WRIA 1 wide application.

The March 2004 Preliminary Review Draft WRIA 1 WMP included complete design descriptions for all of the potential WRIA-wide programs. Based on feedback from WRIA 1 participants, a number of modifications were made to many of the programs and/or resulted in programs being deferred for future consideration.

The Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004) included a Water Use Tracking Program. The purpose of the program was to establish a local framework and process to assist with solving problems currently associated with the administration and enforcement of water rights, setting and meeting instream flows, and preparing for the potential of a general adjudication of water rights in WRIA 1. Specific goals and action strategies were developed focusing on cleaning up water rights records and processing water rights applications; clarifying, tracking, and monitoring water use; obtaining data to support a water rights market should one be desired in the future; improving flows, salmon habitat, and other environmental values; and preparing for a general adjudication of water rights in the coming years.

Based on feedback obtained during the review of the Preliminary Review Draft Plan, the Water Use Tracking program is no longer being considered as a distinct program for implementation in 2005/2006. Instead, some elements of the Water Use Tracking program have been incorporated into other sections of the Review Draft WMP Plan. Specifically, actions to clarify, track, and monitor water use are now included in the long-term monitoring program (Section 3.10). Additionally, a number of the proposed Water Use Tracking Program goals will be addressed through implementation of the instream flow pilot negotiation projects in the Middle Fork and Bertrand drainages.

The original (March 2004) Water Use Tracking Program is being included in Appendix F. The purpose for retaining the program is to enable the concepts that it contains to be considered in future program updates. Inclusion of the program in

Appendix F does not mean that the original program concept has been agreed to by all WRIA 1 participants.

3.7.3 Overview of Recommended WRIA-Wide Programs

There are five programs recommended for inclusion and implementation in the 2004 WRIA 1 Phase 1 Watershed Management Plan: Compliance; Low Impact Development; Natural Resources Integration Policy; Public Involvement and Education; and Water Use Efficiency. An overview of the recommended WRIA-wide programs follows and includes a project description, performance measures, resource needs, schedule, lead entity, and other involved parties. As previously mentioned, each program includes the original design concept as background for consideration in future WMP or project updates. A summary table of all of the WMP recommendations and lead entities is included in Section 5 as part of the WRIA 1 WMP 2005/2006 work plan.

◆ Compliance Program

Description: The purpose of the WRIA 1 Compliance Program is to 1) improve compliance with water-related environmental regulations using coordinated, interagency education, technical assistance, enforcement, and compliance monitoring; and 2) to determine the effectiveness of water-related regulations. More specifically, the goals of the Compliance Program are to:

1. Ensure that the public understands existing regulations that address WRIA 1 water supply, instream flow, water quality, and fish habitat issues.
2. Provide technical assistance to those who are regulated.
3. Understand where and why compliance is not adequate.
4. Conduct prioritized formal enforcement actions necessary to achieve the goals of the WRIA 1 Watershed Management Plan.
5. Evaluate the effectiveness of existing regulations by measuring their net environmental benefits whenever feasible, and/or by evaluating changes in individual knowledge, attitudes, and behavior through compliance monitoring.

6. Recommend changes to regulations that are not found to be effective.

Achieving these goals will require using and updating existing information in order to communicate to the public the reasons for the regulations; support existing mechanisms for providing technical assistance and enhancing available assistance where necessary; improving interagency communication, protocols, and resources regarding enforcement; inventorying, evaluating, and recommending actions needed to ensure adequate compliance monitoring programs; identifying regulations that are not achieving their intended purpose and, where appropriate, recommending necessary changes. A phased approach to implementing the compliance program beginning in 2005 and 2006 with the emphasis being on the following tasks:

- Continue WRIA 1 wide water rights education efforts initiated with the Stage 1 Water Right work conducted as part of the WRIA 1 Watershed Management Project.
- Conduct focused water right education and technical assistance in the WRIA 1 instream flow pilot negotiation areas (i.e., Bertrand and Middle Fork);
- Whatcom County will focus on County Shoreline Master Program and Critical Areas ordinance evaluation and enforcement;
- Whatcom County will work with cities to develop coordinated education efforts related to the Shoreline Program and Critical Areas Ordinance; and
- Initiate efforts to implement Compliance Program goals 3-6 including tasks leading to a review of existing regulations for effectiveness and prioritizing compliance actions if needed with the intent being to work throughout WRIA 1 but with an initial focus within a drainage based management approach where available to achieve compliance.

The results of these tasks will be used to define the next steps for implementing the Compliance program for the next WRIA 1 Project implementation update (e.g., after the 2005/2006 project focus). In addition to these outcomes, the Preliminary Review Draft of the WRIA 1 Watershed Management Plan version of the Compliance

program included a number of recommendations that may be considered in future work program updates. These recommendations are listed under “Project Design Details for Consideration in Future WRIA 1 Project Updates”, located at the end of the Compliance program.

Rationale: It is generally recognized by most WRIA 1 participants that water supply, water quality, instream flow, and fish habitat problems can, to some extent, be addressed by improved environmental regulations, better enforcement of existing regulations, better understanding of how and why to comply, and better coordination amongst those responsible for writing, interpreting, and enforcing environmental regulations. The Compliance program is intended to assist in addressing these needs. The program is being phased due to resource constraints, insight that may be offered through implementation of the instream flow pilot negotiations, and concerns expressed by some WRIA 1 Project participants.

Performance Measures: Performance measures for the Compliance program tasks will include at a minimum, progress reports and updates on the actions taken and any results obtained. In addition, recommendations will be provided for the next steps in implementing the overall Compliance program for consideration as part of the WRIA 1 Project implementation update that will follow the 2005/2006 implementation focus.

Public Involvement and Education: Public involvement and education activities will be limited in 2005 and 2006 due to resource constraints. Actions will focus on providing updates to the Planning Unit and their respective caucuses with progress reports using avenues described in Section 4 – Governance and Implementation.

Program Resources: Water rights work will be accomplished (at least initially) with existing staff and resources, a portion of which will come from funds allocated to implement the instream flow pilot project in Bertrand Creek. Whatcom County Shoreline and Critical Area work will be accomplished with existing County staff and resources. Resources needed to initiate efforts to implement program goals 3-6 within a drainage based management approach are expected to be integrated with the instream flow pilot project activities and will be defined through those efforts.

Schedule: All tasks except the recommendations for work program update will be initiated in 2005 and continued in 2006. The recommendations for work program update will be completed in 2006.

Lead Entity: Department of Ecology will be lead for water rights activities in coordination with the Instream Flow Pilot Negotiation programs. Whatcom County will be lead for shoreline/critical area work.

Involved Entities: Water rights activities will likely involve a number of entities including participants in the Instream Flow Pilot programs, and WRIA 1 residents in general. Shoreline and Critical Areas actions will initially involve the cities with eventual outreach to the broader community.

Project Design Details for Consideration in Future WRIA 1 Project Updates:

The information outlined below reflects the original design concept outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan. It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that the inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

- Establish a Compliance Program Implementation Committee (CPIC) that would be used to evaluate the Compliance Program goals and, based on the evaluation, develop an implementation strategy for the program with the initial focus being on a specific set of regulations or geographic area. The CPIC would also establish annual goals for the program based on available budget and resources. The Committee would be composed of representatives from local regulatory agencies including Whatcom County Health and Human Services, Planning Division, and Public Works, the planning departments and public works departments of the City of Bellingham and the small cities, and representatives

from the Lummi Nation and Nooksack Tribe Natural Resources and Planning Departments; state agencies as applicable (e.g., Ecology, WDFW, DNR, DOH); and federal agencies as applicable (e.g., EPA, NOAA Fisheries, USFWS, Corp of Engineers).

- Use written and web-based information, public education sessions/tours, and provide additional staff to communicate the importance of regulations.
- Fund additional technical assistance positions, explore opportunities for interagency resource sharing, and create directories of qualified consultants to provide for-fee technical assistance.
- Establish a web-based communication system to facilitate access to existing compliance or violation tracking systems, and consider adopting a parcel based search capacity to improve search efficiency.
- Improve enforcement protocols (e.g., tickets, mediation, civil penalties, liens, criminal prosecution). Analyze existing protocols for effectiveness and identify successful protocols for use in other regulations.
- Improve availability of enforcement resources by identifying interagency opportunities for joint funding of personnel, lobbying legislature for state funding, and pursuing local funding from general or dedicated source.
- In conjunction with the long-term monitoring program, develop criteria for evaluating whether regulations are effective by measuring their net environmental benefits whenever feasible, and/or by evaluating changes in individual knowledge, attitudes, and behavior. Analyze information and develop an action plan to address identified issues.
- Consider phasing in the next steps for the Compliance program beginning with a determination of the regulations that are effective. Only those regulations would be considered for WRIA 1 Project support.

◆ Low Impact Development

Description: The purpose of the Low Impact Development program is to reduce development impacts on water resources through the increased use of Low Impact Development techniques. It is designed to build upon existing community efforts and partnerships and to be responsive to future changes and needs. There are three elements to the program:

Element 1. Identify Challenges and Impediments – The purpose of this element is to identify any challenges and/or impediments affecting increased use of LID practices in existing and new developments. Implementing this task will be through a collaborative effort with affected parties including citizens, developers, and WRIA 1 jurisdictions.

Element 2. Develop Actions and Tools – Building on the information obtained in Element 1, the purpose of this task is to identify and develop audience specific tools and other forms of assistance that can be used by citizens, developers, and local jurisdictions in the project design/review process. The tools and assistance envisioned for this program will require collaboration with the jurisdictional departments involved in permitting and planning.

Element 3. Identify Incentives – The purpose of this element is to work within jurisdictional departments to identify and develop appropriate incentives to encourage and facilitate the use of LID tools for planning, designing, constructing, and retrofitting new and existing development.

Implementation of tasks associated with these elements will be phased. In 2005 and 2006, the following tasks will be implemented:

- Whatcom County will continue with existing efforts to develop watershed-based regulations and pursue capital facility planning that incorporates opportunities for low impact development practices;
- Other jurisdictions will continue existing efforts;

- Monitor progress on low impact development pilot projects for consideration in future WRIA-Wide actions; and
- Revisit overall program and determine next steps for consideration in future WRIA 1 Project plan update.

Program details included in the original Low Impact Development design outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan, will also be considered in identifying future tasks. The original program design details are provided in “Project Design Details for Consideration in Future WRIA 1 Project Updates”, located at the end of the Low Impact Development Program subsection.

Rationale: The Low Impact Development program is recommended because current and future development practices are among activities that, through their effects on water quantity, water quality, instream flows, and fish habit, can pose challenges in meeting the overall goals of the WRIA 1 Project. It is expected that these challenges and effects will continue or increase as population growth and development continues. The use of Low Impact Development practices are techniques that are increasingly being used to reduce the effects of development. The phased approach is recommended for the following reasons: it helps ensure that the overall program builds upon existing efforts, avoids potential duplication of efforts between jurisdictions’ departments, and recognizes resource limitations.

Performance Measures: At a minimum Whatcom County and other jurisdictions will provide a progress report that includes status of and assessment of actions taken and any results obtained. Additional details on performance measures may be provided by jurisdictions depending on the actions taken. Recommendations will also be developed for next steps in implementing the Low Impact Development Program.

Public Involvement and Education: Public involvement and education activities will be limited in 2005 and 2006 due to resource constraints. Actions will focus on providing updates to the Planning Unit and their respective caucuses with progress reports using avenues described in Section 4 – Governance and Implementation.

Program Resources: Implementation of 2005 and 2006 activities will occur with existing Whatcom County staff resources and those of other jurisdictions.

Schedule: Actions for all tasks except the recommendations for work program update will be initiated in 2005 and continued in 2006. Recommendations for the work program update will occur in 2006.

Lead Entity: Whatcom County will provide lead for County tasks; the City of Bellingham will be lead for City actions, and the small cities caucus representative will be lead for reporting small city activities.

Other Involved Entities: It is anticipated that other stakeholders including members of the Planning Unit caucuses may be contacted as part of the 2005/2006 efforts.

Project Design Details for Consideration in Future WRIA 1 Project Updates:

The information outlined below reflects the original design concept outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan. It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that the inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

Five tasks were identified to implement Element 1 as follows:

1. Identify LID Projects that have been implemented in WRIA 1 and conduct interviews with involved parties in order to identify the nature and extent of any challenges or impediments they encountered and how they were resolved, and the type of assistance that would have been helpful.
2. Work with the cities, County, and other jurisdictions or parties to identify and monitor any LID projects underway or being proposed (e.g., Whatcom County LID Facility and Road Pilot Program) to identify any impediments or challenges

encountered and how (if) they were resolved, and the type of assistance that would have been helpful.

3. Conduct focused interviews with several different audiences (e.g., homeowners, developers/builders, architects, and others) that are not actively involved in using LID practices or have had limited involvement, in order to identify why they have not used the practices and what (if anything) would be needed in order for them to do so.
4. Work with local jurisdictions and state agencies to identify impediments to implementation of LID practices. This will be performed using existing studies and compiling a list of potential LID practices that will be reviewed by local jurisdictions in order to identify any limitations and/or considerations that would need to be taken into account in order to use the technique.
5. Identify an on-going mechanism to update the list of challenges and impediments.

Three tasks were identified to implement Element 2, building on the work completed for Element 1.

1. Develop a list of existing resources, contacts, and related information that can meet some of the needs identified in Element 1.
2. Identify needs that cannot be met through existing programs. This could include development and distribution of education material, and technical assistance.
3. WRIA 1 will offer a clearinghouse of what jurisdictions within the WRIA basin are using Low Impact Development and offer education if needed. All regulation and technical assistance on Low Impact Development Building Standards shall remain with an individual jurisdictions' public works, engineering, or planning offices, whichever is applicable.
4. Update tools and assistance as necessary to address new needs.

Element 3 focused on developing incentives by using what was learned in elements 1 and 2, and looking at other areas of the country for possible examples.

◆ Natural Resources Policy Integration

Description: The purpose of the Natural Resource Policy Integration (NRPI) program is to assure improved coordination among water-related natural resource plans and policies developed within the jurisdictions of WRIA 1. This includes improving the overall effectiveness and efficiency of developing, implementing, and evaluating the natural resource plans and policies. There are three program goals, 1) improve efficiency and effectiveness of water related natural resource planning and policy development, evaluation, and implementation among WRIA 1 jurisdictions; 2) utilize the WRIA 1 Project as a central clearinghouse for “best available science”; and 3) continuously improve the NRPI program.

Achieving these goals will require identifying (and prioritizing) specific problems associated with relevant plans and policies, enhancing existing and developing new coordination mechanisms, sharing resources, utilizing the scientific information and decision support system developed for the WRIA 1 Project in developing and updating plans and policies, and developing mechanisms to assure the NRPI program is updated. These actions will be phased, beginning with two activities in 2005 and 2006:

- Whatcom County will focus on integration and coordination of the following programs and efforts: WRIA 1 Project; salmon recovery; Shoreline Master Program; Critical Areas; and Parks, Recreation, and Open Space.
- A matrix or similar document will be developed that identifies specific gaps, overlapping requirements, inconsistencies, contrary conclusions, and requirements associated with natural resource plans and policies among and within jurisdictions³; and

The results of these two activities will be used to identify the next steps in the NRPI program for inclusion in the overall WRIA 1 Project plan update in 2006. In addition, the Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004) version of the NRPI program included a number of recommendations

³ Different jurisdictional requirements associated with riparian buffers is a specific example of the type of information that could be included in the report/matrix.

that may be considered in future work program updates. These recommendations are listed under “Project Design Details for Consideration in Future WRIA 1 Project Updates”, located at the end of the NRPI program description.

Rationale: Inadequate coordination of natural resource planning and policies among and within jurisdictions can have significant impacts on water quantity, quality, instream flow, and fish habitat. Particular problems identified in WRIA 1 include policy gaps, overlapping requirements, inconsistencies, and contradictory conclusions, and/or requirements within and among plans and policies. The NRPI Program is intended to assist in addressing these coordination problems. The program is being phased based on concerns raised by a number of Planning Unit participants, particularly with regards to the resource requirements and the need for more focused and specific actions.

Performance Measures: Performance measures for the NRPI program include:

1. At a minimum Whatcom County will provide a progress report that includes the status and assessment of actions taken and results obtained associated with the focused effort to integrate the WRIA 1 Project, salmon recovery, Shoreline Program, Critical Areas Ordinance, and Parks, Recreation, and Open Space programs.
2. Whatcom County will provide a report/matrix describing the actions taken and results obtained to address specific gaps, overlapping requirements, inconsistencies, contrary conclusions, and requirements associated with natural resource plans and policies among and within jurisdictions.
3. Recommendations for next steps in implementing the NRPI program for consideration in WRIA 1 Project plan updates.

Public Involvement and Education: Public involvement and education activities will be limited in 2005 and 2006 due to resource constraints. Actions will focus on providing updates to the Planning Unit and their respective caucuses with progress reports using avenues described in Section 4 – Governance and Implementation. Additional actions may be considered if new resources become available.

Program Resources: Whatcom County work associated with integration and coordination of WRIA 1, salmon recovery, Shoreline Program, Critical Areas, and Parks, Recreation, and Open Space will be accomplished with existing staff and resources in 2005 and 2006. The County will initiate development of the report/matrix or similar report using existing staff resources; however additional resources may be sought as work continues. Additional resources may be sought for future actions (2007 and beyond) depending on the next steps being recommended.

Schedule: Program integration will be initiated in 2005 and continued in 2006. Development of the matrix/report summarizing gaps and inconsistencies will be initiated in 2006. The overall program will be revisited in 2006 to develop recommendations for the next steps.

Lead Entity: Whatcom County

Involved Entities: Anticipated parties include representatives of the planning and public works departments of Whatcom County, the small cities, and the City of Bellingham, the PUD No. 1, Lummi Nation Natural Resources Department, Nooksack Tribe Natural Resources Department, Land Development Caucus, Environmental Caucus, appropriate state agencies, appropriate federal agencies, Whatcom County Conservation District, Water District Caucus, Non-Government Water Systems Caucus, WID/CIDMP, Western Washington University, Center for Economic and Business Research, and other interested WRIA 1 Project participants.

Project Design Details for Consideration in Future WRIA 1 Project Updates:

The information outlined below reflects the original design concept outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan. It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that the inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

- Develop and update a central library and associated electronic data base that would include copies of relevant plans and policies;
 - Establish a Policy Coordinating Committee (PCC) would build upon work of existing interjurisdictional GMA Coordinating Committee. The PCC would be responsible for developing and implementing future actions to address the goals of the NRPI Program. For example, update gaps/inconsistencies and problem prioritization; coordinate input on relevant plans and policies; ensure use of technical information and WRIA 1 decision support system in planning and policy development; and identify and prioritize water resource problems potentially linked to GMA related land use and water, wastewater, and storm water management policies. Responsibilities would include developing the budget and resources necessary to implement the program. The Policy Coordinating Committee would be composed of a wide variety of local, state, and tribal agency representatives and interested groups.
 - Continue to improve NRPI program through adaptive management including the selection and monitoring of performance measures.
 - Develop incentives for continued participation.
- ◆ Public Involvement and Education

Description: The purpose of the Public Involvement and Education (P.I.E.) Program is to continue to build the community's capacity to understand general water resource issues, with the eventual goal of more extensive community engagement in the development of water-related policies in WRIA 1.

In order to achieve this goal, a number of audience specific actions will need to be taken. Examples of audiences that have been identified for these actions include elected and/or appointed decision makers, voters, sub-basin residents, businesses, media, and students/schools. There are currently many different entities involved in providing water related education in WRIA 1. The intent of the public involvement and education activities identified in this program is to build upon, and not duplicate, existing efforts. The P.I.E. Program in the Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004) included recommendations focusing on

two of these audiences – schools/students and the general public. Based on subsequent input from WRIA 1 Project participants and in recognition of resource limitations, the original P.I.E program recommendations have been modified and, as with implementation of other WMP programs, are being phased.

The focus of P.I.E. efforts in 2005 and 2006 will be on educational activities in sub-basins, and in particular the instream flow pilot negotiation areas (i.e., Bertrand and Middle Fork). Participants involved in the instream flow negotiation pilots will develop the specific type and extent of P.I.E. activities to be undertaken as part of those negotiations. Participants may consider the March 2004 P.I.E. Program recommendations as they develop their scope of work. These March 2004 recommendations should also be considered in future WRIA 1 Project plan updates. The original P.I.E. Program recommendations from the Preliminary Review Draft WMP (March 2004) are listed under “Project Design Details for Consideration in Future WRIA 1 Project Updates”, located at the end of this P.I.E program section.

Rationale: WRIA 1 faces a variety of water resource issues, including water supply availability, impaired water quality, endangered fish species, and uncertainty about the appropriateness of current instream flow standards. However, the public’s understanding of and engagement in fundamental water resource issues are low compared to the magnitude of the issues. In order to comprehensively address the community’s current and future needs, policymakers need their constituents to be informed and involved. The Public Involvement and Education program was developed to meet this need.

Performance Measures: The specific P.I.E. actions and their associated performance measures will be developed by participants in the instream flow pilot negotiations. It is expected that targeted water rights education will be a key component of the program.

Public Involvement and Education: Not applicable

Program Resources: A portion of the 2004 Whatcom County Supplemental budget has been allocated to implement the Bertrand Creek Instream Flow Pilot Negotiation

project. It is anticipated that a portion of those funds will be allocated to support educational activities. A portion of the 2004 Governor's supplemental budget for resolving Lummi Nation water rights issues is also allocated for public involvement and education efforts. Ecology implementation funds may also be pursued. Ecology staff will be relied upon to help meet the water right education needs.

Schedule: Actions will be initiated in 2005 and will continue throughout the instream flow pilot negotiation programs. The exact duration is not known but is likely to vary with the geographic area.

Lead Entity: It is anticipated that the Public Utility District No. 1 will be program lead for the Bertrand Creek instream flow pilot project and as such will oversee educational activities. The City of Bellingham is the likely program lead for the Middle Fork instream flow pilot project and is likewise expected to oversee educational activities. Ecology staff will be lead in working within both areas to provide education on water rights.

Involved Entities: A number of other local, state, tribal, and federal parties may be involved in providing the educational activities within the two instream flow pilot areas, including community members, Watershed Improvement District members (for Bertrand), Lummi Nation, Nooksack Tribe, and Whatcom County.

Project Design Details for Consideration in Future WRIA 1 Project Updates:

The information summarized below reflects the original design concept outlined in the Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004). It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that the inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

The recommendations included in the March 2004 Preliminary Review Draft Plan included public involvement and education activities that focused on two main audiences – students (primarily K-12) and the general public. The following list of activities was suggested for implementation for each audience:

- Student Education – *Teaching materials* – Provide comprehensive, updated teaching materials, especially visuals, based on current science and the findings of the WRIA 1 Project; *Web Site* – Develop a web site on WRIA 1 water issues tailored to support schools; *E-mail Lists* – Develop e-mail lists for educators with water facts culled from recent studies, ideas for student projects, service learning opportunities, and other information to help teachers present information about local water issues to their classes; *Water Quality Monitoring Program* – Assess schools’ interest in a water quality monitoring program for students; *Water Curriculum* – Participate in the development of a standard water curriculum based on discussions with Western Washington University, school districts, teachers, and sources outside the county; and *Student Resources* – Develop a packet on water issues for different grade levels, tailor portions of the web site similarly, and host a lending library.
- General Public Education – *State of the Watershed Report* – Benchmarks that are understandable by the public should be established and progress towards those benchmarks should be documented and collected in a State of the Watershed Report. Related events could include an annual “stockholder” meeting to discuss progress; *Guide to Local Water Resources* – Update and maintain the *Water in Whatcom County* resource guide; *Coordinate Educational Efforts* – Compile and use existing education programs and materials to the extent possible. Provide a forum for exchanging information about ongoing efforts and coordinating projects and programs where possible; *Web Site* – Develop a web site that serves as a clearinghouse for accessing and interpreting data about water issues in WRIA 1; *Stewardship Materials* – Develop and distribute guides for specific actions that people can take to change their behavior and become better stewards of water resources; and

Sub-Basin Outreach – Foster efforts to conduct outreach to citizens on a sub-basin level.

◆ Water Use Efficiency

Description: The purpose of the WRIA 1 Water Use Efficiency Program is to identify water use efficiency measures for domestic, municipal, commercial, industrial, and agricultural water supplies and to identify and remove legal disincentives to water use efficiency programs. The intent of the program is to implement actions that will positively influence seasonal water supply. There are three elements to the program:

Element 1. Water Use Efficiency for Domestic, Municipal, Commercial, and Industrial Water Supply – The purpose of this element is to develop a detailed water use efficiency program for domestic, municipal, commercial, and industrial water supply. A forum will be convened to identify priorities for water use efficiency programs. A needs assessment for public information relative to water use efficiency will be conducted. Based on the outcome of the needs assessment, an educational program about water use efficiency targeting domestic, municipal, commercial, and industrial water supply users will be implemented.

Element 2. Water Use Efficiency for Agriculture – The purpose of this element is to develop a detailed water use efficiency program for agricultural users and support its implementation by providing public education and technical support for Best Management Practices and other water use efficiency projects. As necessary, pilot projects will be developed to evaluate effectiveness of the water use efficiency projects.

Element 3. Identify and Remove Legal Disincentives to Water Use Efficiency Programs – The purpose of this element is to remove existing legal disincentives to water use efficiency programs. The associated objective is to ensure that water system and agriculture interests in the forums created under Elements 1 and 2 of this program are coordinated with other WRIA 1 programs such as the instream flow pilot programs, long-term monitoring program, the Natural Resource Policy Integration

Program, and the Compliance program to address water use efficiency disincentives in current laws and programs.

The Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004), included specific objectives, tasks, and parties associated with implementing each of the elements above. Based on subsequent input from WRIA 1 Project participants and in recognition of resource limitations, the original recommendations have been modified and are being phased. An additional reason for phasing the activities is that the State Department of Health (DOH) is in the process of updating its water use efficiency requirements under the 2003 Municipal Water Supply-Efficiency Requirements Act. The Act directs DOH to adopt a new water use efficiency rule by the end of 2005; these new requirements may influence the recommendations in this program.

The focus of activities in 2005 and 2006 will be on developing and implementing water use efficiency measures (as necessary) associated with the instream flow pilot negotiation areas. Participants in the instream flow pilots will be responsible for developing the specific type and extent of activities necessary. Participants may wish to consider the recommendations in the original water use efficiency program design outlined in the March 2004 Preliminary Review Draft WMP. These March 2004 recommendations should also be considered in future work program updates. Toward that end, they are listed under “Project Design Details for Consideration in Future WRIA 1 Project Updates”, located at the end of this Water Use Efficiency program section.

Rationale: One of the goals of the WRIA 1 Project is to have water supplies sufficient to be meet current and future instream and out-of-stream needs. One of the ways to assist in meeting this goal is by ensuring efficient use of existing and future supplies. There are a variety of specific mechanisms that can help promote efficient water use. The purpose of this program is to support implementation of such mechanisms for domestic, commercial, municipal, industrial, and agricultural water supplies.

Performance Measures: Specific actions and associated performance measures will be developed by participants in the instream flow pilot negotiations.

Public Involvement and Education: Public involvement and education activities will be limited to those conducted as part of the instream flow pilot negotiations. Updates and progress reports on their activities will be provided using avenues described in Section 4 – Governance and Implementation.

Program Resources: A portion of the Whatcom County supplemental budget has been allocated to implement the Bertrand Creek instream flow pilot negotiations. A portion of those funds could be used to support water use efficiency measures if desired by the instream flow pilot participants. Additionally, the State has allocated funding to support activities of the Bertrand Creek Watershed Improvement District (WID). If desired, some of those funds could also be used to support water use efficiency efforts.

Schedule: Actions may be initiated in 2005 or 2006 - the exact timeline will need to be determined by instream flow pilot negotiation participants.

Lead Entity: A specific lead for the water use efficiency program is not identified since the program will be considered as part of the Bertrand Creek instream flow pilot project efforts for which the PUD No. 1 is anticipated to be lead. The specific lead to implement such a program may be identified as part of the ISF pilot efforts. Funds received from the State that may be used to implement efficiency measures will be utilized under direction from the WID.

Involved Entities: Aside from the designated project lead identified above, the specific parties involved in 2005/2006 implementation are likely to vary with the project and will be determined when activities are defined.

Project Design Details for Consideration in Future WRIA 1 Project Updates: The information summarized below reflects the original design concept outlined in the March 2004 Preliminary Review Draft WRIA 1 Watershed Management Plan. It includes parts of the original design that have not been included previously in this program description. Retaining the original concept for project design is important

because it may need to be referred to when developing future work plans, drafting Watershed Management Plan updates or amendments, and/or modifying project implementation elements as part of an adaptive management strategy. Please note that inclusion of these original design concepts does not mean they have been agreed to by WRIA 1 Project participants.

Objectives and related tasks to achieve objectives:

1. The Water Utility Coordinating Committee should take the lead on initiating a forum for coordination between agencies and the public to identify priorities for water use efficiency programs.

Task 1. Identify and assess potential water use efficiency programs for inclusion in the water use efficiency program for domestic and industrial uses. Programs that may be considered include but are not limited to water reclamation and reuse, metering, seasonal rate structures, water system audits, leak detection and other programs to reduce unaccounted for water, financial or other incentives, and customer use efficiency programs.

Task 2. Develop criteria or other process(es) for evaluating and prioritizing programs identified in Task 1 above and their relationship to the WRIA 1 Watershed Management Project goals.

Task 3. Recommend an implementation plan to the WRIA 1 Water Resource Management Assembly and WRIA 1 Joint Board relative to initiating the priority programs identified in Task 2 above. The recommended work plan should identify responsible implementing agencies, organizations, or purveyors associated with program implementation.

Task 4. The WRIA 1 Water Resource Management Assembly and WRIA 1 Joint Board adopt the recommended implementation plan from Task 3 above.

2. A public information program for all domestic, commercial, municipal, and industrial water users within WRIA 1 should be coordinated with the WRIA-Wide Public Information and Education Programs.

Task 1. WSU Cooperative Extension-Whatcom County coordinates with the Water Utility Coordinating Committee, Public Utility District No. 1, WRIA 1 water districts and municipalities, and non-governmental water systems to identify and recommend public information needs relative to water use efficiency.

Task 2. Based on the outcomes of the needs assessment in Task 1 above, WSU Cooperative Extension-Whatcom County facilitates development of public information materials or projects that may include but are not limited to brochures, water bill inserts, door hangers, public signage, displays, newspaper articles, public service announcements, newsletter articles, and water use efficiency speakers.

Element 2 – Water Use Efficiency for Agriculture Water Supply

Purpose: The purpose of Element 2- Water Use Efficiency for Agriculture Water Supply is to develop detailed water use efficiency programs for agriculture. The affected resource users and state and local regulatory authorities should develop the programs collaboratively.

Objectives and related tasks to achieve objectives include:

1. The Whatcom County Agriculture Preservation Committee (WCAPC) supported by the WRIA 1 Project Implementation Team should take the lead on initiating a forum to identify priorities for agricultural water use efficiency programs.

Task 1. Involve farmers, special districts, water resource agencies, agricultural organizations, tribes, state and local agencies, and the public in identifying and assessing potential water use efficiency programs for agricultural uses.

Task 2. Develop criteria or other process for evaluating and prioritizing programs identified in Task 1 above and their relationship to the WRIA 1 Watershed Management Project goals.

Task 3. Recommend an implementation plan to the WRIA 1 Water Resource Management Assembly and WRIA 1 Joint Board relative to initiating the priority

programs identified in Task 2 above. The recommended work plan should identify responsible implementing agencies and resource needs.

Task 4. The WRIA 1 Water Resource Management Assembly and WRIA 1 Joint Board adopt the recommended implementation plan from Task 3 above.

2. Provide technical support to the agriculture community for implementing water conservation Best Management Practices (BMPs) and other water efficiency projects.

Task 1. The Whatcom Conservation District with involvement of the agriculture forum created under Objective 1 should take the lead on identifying and pursuing options for technical support to the agricultural community. Options to consider include but are not limited to federal, state, and local entities such as the USDA Natural Resources Conservation Service, Washington State Department of Ecology, WSU Cooperative Extension-Whatcom County, Whatcom Conservation District, and Watershed Improvement Districts that may be established under RCW 87.03.

Task 2. The Whatcom Conservation District works with the WRIA 1 Project Implementation Team to draft and submit a report of recommended options to the WRIA 1 Water Resource Management Assembly and WRIA 1 Joint Board.

3. Develop pilot programs to evaluate effectiveness of water use efficiency projects.

Task 1. The Whatcom County Agriculture Preservation Committee (WCAPC), the agricultural forum developed under Objective 1, Whatcom Conservation District, WRIA 1 Project Implementation Team technical representatives, and other interested parties identify potential pilot programs or projects and locations for the pilot projects. The WRIA 1 Decision Support System may be a source of technical information for purposes of selecting projects or locations.

Task 2. Develop criteria or other process for evaluating list of potential pilot programs.

Task 3. WRIA 1 Project Implementation Team staff assists the Whatcom Agriculture Preservation Committee in completing the application process for a WRIA 1 Pilot Project under the approved 2004 WRIA 1 WMP.

4. Provide for a coordinated public information program for farmers and others in the agriculture community with the WRIA-Wide Public Information and Education Programs.

Task 1. WSU Cooperative Extension-Whatcom County coordinates with the Whatcom Conservation District, Watershed Improvement Districts established under RCW 87.03, WCAPC, and others to identify and recommend public information needs relative to water use efficiency.

Task 2. Based on the outcomes of the needs assessment in Task 1 above, WSU Cooperative Extension-Whatcom County facilitates development of recommended public information materials or programs that may include but are not limited to brochures, displays for agricultural events, programs through 4-H and FFA, newspaper articles or guest editorials, public service announcements, newsletter articles, and water use efficiency speakers.

Task 3. WSU Cooperative Extension-Whatcom County works with WRIA 1 Project Implementation Team to prepare and submit a needs assessment report.

Element 3 – Identify and Remove Legal Disincentives to Water Use Efficiency Programs

Objectives and related tasks to achieve objectives:

1. Ensure that water system and agriculture interests in the Water System Coordinating Committee and forums created under Elements 1 and 2 of this program coordinate with the ISF Selection and Adoption Action Plan, WRIA 1 Water Use Tracking Program, the WRIA 1 Natural Resource Policy Integration Program, and the WRIA 1 Compliance Program to address water use efficiency disincentives in current laws and programs.

2. Identify programs for the WRIA 1 Water Use Tracking Program, individuals working alone, and other organizations that may address the following:
 - a) Identify the portions of existing Washington State water law that promote water use efficiency and identify recommended improvements.
 - b) Changes in utility tax provisions that provide additional incentive for water use efficiency programs.

3.8 Other Management Recommendations for WRIA 1 Watershed Management Plan

3.8.1 Purpose

The purpose of “Other Management Recommendations” is to describe actions, solutions, or alternatives submitted by WRIA 1 participants for consideration in the Watershed Management Plan – Phase 1. The intent of “Other Recommendations” was to increase recommendations in the Plan to address WRIA 1 issues beyond what could be addressed within the scope, timeline, and budget of Parametrix.

3.8.2 Process for Submitting “Other Management Recommendations”

Given scope and timeline constraints, Parametrix was limited to the number of WRIA-Wide Programs and Pilot Projects that they could assist WRIA 1 Participants in developing for the WRIA 1 Watershed Management Plan. In order to address this limitation, WRIA 1 Participants were invited to submit recommendations for inclusion in the internal review draft of the Watershed Management Plan. The WPTT memo inviting the submissions also indicated that the submissions needed to be developed without the assistance of Parametrix and that the proponent needed to include the same type of information as the WRIA-Wide Programs and Pilot Projects. It was recognized, however, that the level of detail provided in the recommendation may vary.

Consistent with the WPTT memo, a small group of WRIA 1 Staff Team members worked together to identify a list of potential projects for consideration in the WRIA 1 WMP. This small group drew on their combined knowledge of potential projects that had been previously discussed either as part of the WRIA 1 Project or as part of a

previous planning effort. The group recognized that many of the items in their list were neither “programs” nor “pilot projects” and, therefore, identified their list only as “projects”. The list of projects along with the completed worksheets describing the projects were submitted to the WPTT, WRIA 1 Staff Team, and Planning Unit with the intent of obtaining their agreement that the list of projects should be included in the draft WMP. As with all of the WRIA-Wide Programs and Pilot Projects, the understanding was that the list of projects and their content would be further discussed and commented on as part of the internal review draft of the WMP.

3.8.3 Overview of “Other Management Recommendations”

Nine programs were included as “Other Management Recommendations” in the Preliminary Review Draft WRIA 1 Watershed Management Plan (March 2004). These programs covered recommendations related to: agricultural water reclamation and reuse; evaluating the potential for deep aquifer supplies and storage; evaluating the potential to import water from British Columbia or the Skagit basin; establishing a water rights information center; reviewing water banking and water marketing as a water resource management tool; summarizing the process and challenges associated with water transfers; a fish culvert inventory and fish passage assessment project; and a dairy biodigester project aimed at helping reduce nitrates in ground water.

Based on comments received during the review of the March 2004 Preliminary Review Draft Watershed Management Plan- Phase 1 and in recognition of resource limitations, implementation of these programs is considered a lower priority than other programs for the 2005-2006 timeframe. For that reason, descriptions of these programs are not included in this section. However, with the exception of the fish culvert and dairy biodigester project⁴, the program descriptions for the “Other Management Recommendations” are included in Appendix F. The programs are included in the Appendices so that they can be considered in future work program updates. In addition to future work programs, they may also be considered to support solutions as the Bertrand and Middle Fork Instream Flow Pilot Negotiation projects are implemented. As

⁴ The fish culvert and dairy biodigester project are either in progress or near completion and should not be considered in their current form in future updates. Results of these projects should however, be considered in implementing and updating the WRIA 1 Plan

with other programs recommended for consideration in future program updates, it should be noted that inclusion of these programs in Appendix F does not mean they have been agreed to by WRIA 1 Project Participants.

3.9 Lake Whatcom Watershed

3.9.1 Purpose

The purpose of this section of the WRIA 1 Watershed Management Plan – Phase 1 is to provide an update and description of the current structure of the Lake Whatcom Management Program, the connections with the WRIA 1 watershed planning effort, and how tools developed through the WRIA 1 Project will be integrated into the Lake Whatcom Management Program. This update is not intended to provide recommendations for managing Lake Whatcom – such recommendations occur within the context of the existing Lake Whatcom management program.

3.9.2 Background

Lake Whatcom, the largest lake in WRIA 1, is the source of drinking water for about half the population of WRIA 1. The lake provides water for the City of Bellingham, Lake Whatcom Water and Sewer District, several other smaller water districts/associations, and about 250 homes that draw water directly from the lake. In addition, there is continued interest in expanding the delivery of water from Lake Whatcom to other areas of WRIA 1 where supplies are limited. These facts alone make Lake Whatcom a critical resource for watershed planning in WRIA 1.

Lake Whatcom is a multiple use lake and watershed. In addition to providing water for drinking, commercial, and industrial uses, the lake is used for boating, swimming, and fishing. The majority of the watershed (approximately 80%) is forested particularly around the large southernmost basin of the lake. Other land uses

For information on the Lake Whatcom Management Program and how to get involved contact:

- Clare Fogelsong, City of Bellingham (671-6961; cfogelsong@cob.org)
- Erika Stroebel, Whatcom County (676-6876; estroebe@co.whatcom.wa.us)
- Jim Neher, Lake Whatcom Water and Sewer (734-9224; JimNeher.WD10@comcast.net)

Information can also be found on the Lake Whatcom website (<http://lakewhatcom.wsu.edu>). Please note that the website is currently being updated.

include residential development (approximately 5,000 homes are located within the watershed), limited agriculture and commercial development, parks, and other public facilities. The City of Bellingham and Lake Whatcom Water and Sewer District are responsible for ensuring drinking water standards are met for their customers. To date water supplies have consistently met standards. The ability to continue to meet drinking water standards, while minimizing avoidable and potentially prohibitive additional costs, requires maintaining source water that requires minimal treatment. The on-going management challenge is trying to determine the extent to which multiple activities can occur within the watershed while maintaining safe, clean drinking water.

A variety of agencies, organizations, and individuals play a role in managing and protecting Lake Whatcom. In an effort to coordinate efforts of these various players, an interjurisdictional management program was established in 1990 involving three of the key agencies, the City of Bellingham, Whatcom County, and Lake Whatcom Water and Sewer District. A series of goals were jointly adopted in 1992 through a joint resolution that has provided the policy direction and guidance for watershed management activities. The joint management program was formalized in a 1998 interlocal agreement that has provided management structure, process, and a stable source of funding.

Through a variety of recent efforts in the Lake Whatcom watershed, there was a recognition that additional tributary and storm event water quality and water quantity data were needed to develop pollutant loading and lake response models. These models will provide technical assistance in evaluating both the effects of land use activities on water quality and the potential reduction of pollutants through land use based management options. In an early effort to coordinate the WRIA 1 Project with Lake Whatcom management, it was agreed that the Lake Whatcom models and associated data collection efforts would be developed through the WRIA 1 Project in coordination with the Washington State Department of Ecology Total Maximum Daily Load (TMDL) study⁵. The models were described previously in Section 2 of this WMP.

⁵ The Ecology TMDL work is going on at the same time as the WRIA 1 modeling and the projects and data needs were coordinated as possible to avoid duplication of efforts.

The models are scheduled for completion in 2005. At that time, they will be used as part of the Lake Whatcom Management program to help evaluate management options and refine recommendations for actions in the watershed. In the meantime, initial work was performed during 2002 to identify priority areas and actions that should be considered. The work is described in a report titled, *Lake Whatcom Management Program in Coordination with WRIA 1 Watershed Management Project, June 29, 2002*. Since the time that report was completed there have been additional actions taken as part of the joint Lake Whatcom Management program with regards to Lake Whatcom, including additional land use regulations and activities to reduce impacts associated with development.

The 2000-2004 Lake Whatcom Management Plan has been updated for the 2005-2009 timeframe. It is anticipated that this Joint Lake Whatcom Management program work plan will be refined in the coming year(s) using the models constructed through the WRIA 1 Project.

3.10 WRIA 1 Long Term Monitoring Program

3.10.1 Background/Purpose

The purpose of the WRIA 1 Long-Term Monitoring Program (LTMP) is to evaluate WRIA 1 Project success, and ensure that the project goals are met (March 2000 SOW). The LTMP serves as a fundamental building block to the WRIA 1 Project by providing on-going information on the status of various water resource concerns, potential trends, causes/sources of problems, and the effectiveness of management actions. This includes management actions within this WMP and future WMP updates as well as management actions undertaken by entities independent of the WRIA 1 Project. The LTMP should provide insight into making changes to existing actions that do not function as intended as well as undertaking new actions. An effective

Complete development of the long-term monitoring program has been deferred to a future date. One of the potential unanticipated benefits of this deferment is that the program will not be completed until after the models have been developed. As a result, it will be possible to see more clearly where additional data may be needed. Additional time will also provide decision-makers an opportunity to use the models and determine how much certainty (and therefore data) they actually need for decision-making purposes.

long-term monitoring program is a critical element to adaptive management as described in Section 4.

3.10.2 Approach

Developing an effective LTMP requires substantial work and the involvement of WRIA 1 Project participants and the decision-makers/parties that will be using the information. Although there is no single or “cookbook” approach used to develop monitoring programs, typical steps and an overall framework are provided in Figure 3.1⁶.

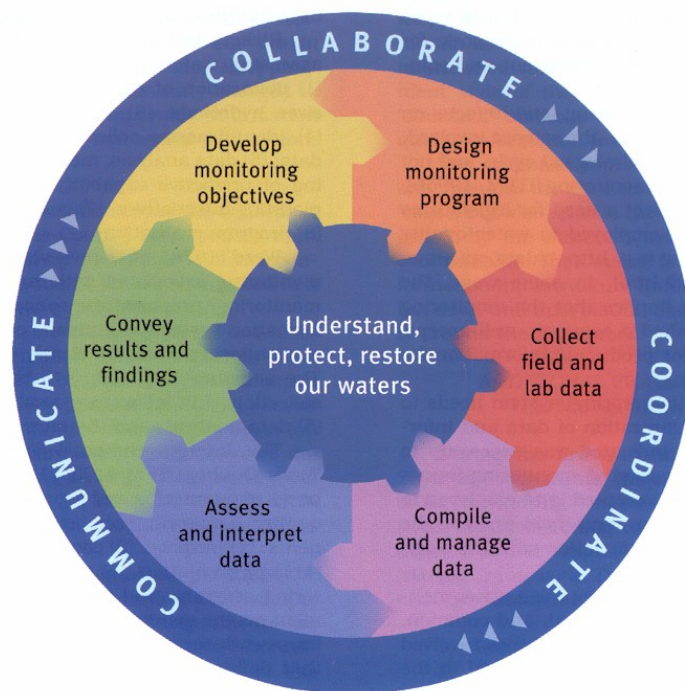


Figure 3.1: Illustration of monitoring framework. (Graphic taken from Water Resources Impact, September 2003, Volume 5, Number 5, page 3)

As with other elements of the WRIA 1 WMP- Phase 1, the WRIA 1 LTMP discussed in this section should be considered a work in progress. Many of the steps, or portions thereof, illustrated in Figure 3.1 above remain to be completed. As part of the original USU Phase III Scope of Work (SOW), a task was included in which they would provide

⁶ A description of this framework is provided in “Framework for Constructing Water Quality Monitoring Programs”, Charles A. Peters and Robert C. Ward, American Water Resources Association, September 2003, Volume, Number 5.

support for developing the monitoring program. When the Phase III SOW was revised, this task was deferred to a future date due to resource constraints. The purpose of this section of the WMP is to describe what has been done to date, and to identify the additional actions needed.

3.10.3 Actions Taken and/or Underway

Although the long-term monitoring plan is not complete, a number of actions have been initiated. General categories are provided below with additional details provided in the sections that follow:

- Summary of existing monitoring programs
- Initial suggestions by USU
- Initial suggestions by local project participants
- Water Quality Program – Centennial Grant

3.10.3.1 Review/Summary of Existing Programs

There are currently a number of different monitoring efforts in the WRIA associated with water quantity, water quality, fish habitat, and instream flows. Many of these programs were identified through the collective work of the USGS, USU, and local WRIA 1 Project participants, and were discussed in Section 2 of this WMP. In addition, PUD No. 1 contract staff worked with local participants to develop a map and initial database of current activities.

The results of the above efforts show that much of the monitoring that has been performed in WRIA 1 is of limited scope (e.g., geographic area and/or parameters measured) and duration. There are in fact, very few locations where data has been collected for more than a few years, and that are readily accessible to the public and decision-makers.

3.10.3.2 Initial Monitoring Recommendations by USU

In order to address some of the gaps noted, many of the USU investigators provided initial suggestions⁷ for monitoring. A summary of these suggestions is provided below:

- Water Quantity:
 - Ground Water – There are expressed concerns regarding the lack of data for: unconfined and, in particular, confined aquifer continuity in the lowlands and coastal areas; confined aquifer hydraulic properties; proper pump tests; ground water recovery; and deep and shallow aquifer connectivity. These recommendations are provided in the USU Phase II report titled, *Ground Water Report for WRIA 1, Phase II: Task 1, 2, 3, and 4 for Ground Water Quantity* .
 - Surface Water –Data needs associated with surface water quantity work focus on stream flow, evapotranspiration, and Snotel (precipitation). Nine additional locations were recommended by USU for additional streamflow gages. The nine locations are located on the lowland tributaries to the Nooksack, a tributary to the North Fork, a tributary to the South Fork, Damfino Creek in the Fraser Sub-basin, and on Colony Creek in the Samish Bay Sub-basin. Three new evapotranspiration stations are recommended – one in each of the upland forks of the Nooksack (North, Middle, and South). SnoTel stations are also recommended for each of these upland drainages, with one in each except the Middle Fork where two are suggested. These recommendations, along with the reasons why the data is needed, are provided in Section 4.2 of the USU Phase II report titled *Assessment of Stream Flow and Climatological Data Available for Use in WRIA 1 Watershed Management*.

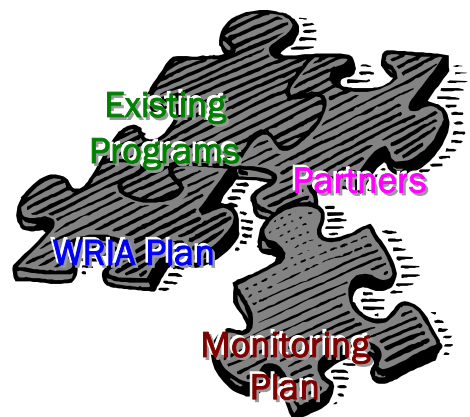
⁷ As briefly alluded to earlier in this section, these initial suggestions were to be refined as part of the Phase III work but this was one of the activities that was deferred to a future date.

- Water Quality:
 - o Ground Water – Three recommendations were provided in the USU Phase II report, *Nitrogen and Pesticide Contamination of Groundwater in Water Resource Inventory Area 1*. They are: 1) Implement a long-term field monitoring scheme across WRIA 1 in order to gather a consistent set of long-term data from spatially distributed locations representing both heavily contaminate areas as well as other area of WRIA 1 with minimal potential for contamination; 2) Gather information on natural attenuation and sorption characteristics of pesticides through soil sampling at selected locations of affected sub-watershed; and 3) Re-assess ground water quality after additional data are obtained through a long-term consistent monitoring program.
 - o Surface Water – Chapter 4 of the USU report titled *WRIA 1 Surface Water Quality Data Collection and Assessment – Phase II Summary Report* provides an extensive list of monitoring recommendations. Seven goals are suggested to guide the program. Over 70 sites are identified for monitoring work. The type of monitoring and frequency varies with the location.

3.10.3.3 Initial Recommendations by Local Project Participants

A work session was held in the spring of 2003 to provide a forum for WRIA 1 Project participants to begin discussing their vision and needs related to a long-term monitoring program. In general, recommendations focused on the need to develop a credible monitoring program that would provide information on status, trends, compliance, sources of concerns, and the effectiveness of management actions. Additional data collection to support the models being developed by USU was also recommended.

Participants of the LTMP work session recommended that information be collected, analyzed, and reported in a manner that can inform decision-makers as well as support adaptive management.



Efforts should be made to identify and monitor agreed upon performance indicators. Data collection should consider real time monitoring where possible and be conducted with appropriate quality assurance/quality control measures. Reporting should be predictable and regular. Promoting coordination between monitoring efforts and involving the community was considered important. This includes incorporating data into the DSS and ensuring it is accessible. Suggestions were also provided for actions that should be taken in the first, fifth, and tenth year.

Follow-up work was conducted by each of the WRIA 1 Technical Teams to begin formulating goals and objectives for water quantity, water quality, instream flows, and fish habitat. This follow-up work also included identifying the type of indicators that should be measured, and (as noted previously) compiling information on existing programs. This information will be considered along with the USU monitoring recommendations as work proceeds in developing a comprehensive WRIA 1 LTMP.

3.10.3.4 Water Quality Monitoring Program – Centennial Grant

In 2002, Whatcom County received a Centennial Clean Water Fund (CCWF) grant through the Washington State Department of Ecology (Ecology) to help develop and implement the water quality portion of the WRIA 1 LTMP. The program was developed by Whatcom County with support from the Public Utility District No. 1. Input to the monitoring program was provided by WRIA 1 Project participants and in particular the Water Quality Technical Team. The previously discussed recommendations (e.g., from Utah State University and other local participants) and recommendations from WSU Cooperative Extension- Whatcom County were also incorporated.

The CCWF monitoring program was developed based on the recognition that it must be comprehensive and adaptive in nature. For that reason it begins with goals and objectives to guide the program. Based on these goals and objectives, specific recommendations for surface water quality monitoring and analysis at 20 new sites are provided and are being implemented. To be considered in management decisions, strategies are included to communicate the information and results to the public and

decision-makers. Provisions to update the plan are provided ensuring that it continues to meet the needs of those using the information.

The CCWF monitoring plan also recognizes the critical importance of promoting stewardship, along with supporting and coordinating existing and new programs. Specific recommendations are made related to each of these areas. The surface water quality monitoring program is designed to build upon existing efforts where possible and to fill gaps where there are no existing programs. The CCWF monitoring plan also describes linkages with the overall WRIA 1 Project implementation and outlines a strategy by which program implementation can continue beyond the timeline of the CCWF grant. Among these actions is pursuit of a long-term funding mechanism and additional grants and partnerships. Work associated with the grant is scheduled for completion in August 2005. However, an extension through August 2006 has been requested and is being pursued in coordination with Ecology.

3.10.4 Additional Actions Needed

The long-term monitoring program is a “work in progress.” The actions that follow provide a strategy to complete development and implementation of the LTMP. The strategy is phased, consistent with the governance structure described in Section 4

Interim Strategy 2005/2006

The 2005/2006 goals related to monitoring will focus on three objectives:

- Providing support to existing monitoring programs in WRIA 1;
- Enhancing the accuracy of water use information; and
- Developing an action plan to fund implementation of the long-term monitoring program so that funding can be considered as the LTMP is developed.

Support for existing monitoring programs will generally focus on implementation of activities associated with the CCWF grant described previously, and on maintaining streamflow gaging stations within the basin. Funds and activities associated with the CCWF grant are expected to last through August 2006. Funding obtained by the Lummi Nation for a number of the gaging stations will end in September 2005. Additional

resources will be needed to continue the gages and elements of the water quality monitoring beyond the dates identified.

With regard to the second objective, an important part of WRIA 1 Project data collection efforts focused on water use estimates as described in Section 2 of this Plan. Continued work is needed to refine the estimates, half of which (volume-wise) are currently based on metered values. In order to continue to improve the accuracy of use estimates, two recommendations are included:

- Obtain annual use estimates from the Washington State Department of Ecology. Ecology is required to obtain water use measurements for 80% of the water use in the WRIA. Obtaining these measurements and integrating them into the WRIA 1 Project database will improve the accuracy of the values and ensure a mechanism whereby they are updated each year; and
- Consider additional actions to refine water use estimates in the Bertrand and Middle Fork Instream Flow Pilot Negotiation areas as determined to be necessary by the Pilot Negotiation participants.

Developing the WRIA 1 LTMP will require implementing the following steps:

- Create and implement a strategy to complete development of the integrated long-term monitoring plan for all components (water quantity, water quality, instream flow/fish habitat) building on existing work and considering modeling results. The strategy should identify who will be involved, their roles and responsibilities, resource requirements, and provisions for periodic review and update of the strategy;
- Obtain financial and other support for the LTMP from WRIA 1 entities; and
- Initiate implementation of the LTMP.

It is anticipated that development of the strategy will require obtaining implementation funding from the Washington State Department of Ecology and therefore will be dependent upon successful receipt of those (or potentially other) funds.

3.11 Summary of Actions to Address Key Issues

Actions to address key issues in the WRIA 1 study area take the form of Pilot Projects, WRIA-Wide Programs, Other Management Recommendations, and a WRIA 1 Long Term Monitoring Program. In all cases, the recommendations were developed through involvement of WRIA 1 participants either through attendance at WRIA 1 Technical Team meetings, workshops, or by direct submission of a program description by individual caucus members. To ensure that the actions meet the stated intent of the project and the over-arching goals of the WRIA 1 Project March 2000 Scope of Work, it will be critical that as recommendations are being implemented there is collaboration and coordination between the involved parties and the WRIA 1 Project participants.

Section 5 of this document includes a summary of the recommended actions, recommended lead agency, resources needed for implementation, and schedule. The information presented in Section 5 is the work plan for the WRIA 1 project in 2005/2006.

SECTION 4

GOVERNANCE AND IMPLEMENTATION AND ADAPTIVE MANAGEMENT

4.1 Purpose and Requirements

One of the fundamental premises of the WRIA 1 Watershed Management Project was the recognition that effective water resource management required a commitment extending beyond the development of the Watershed Management Plan itself. As stated in the March 2000 Scope of Work, “One of the most important elements that will be considered is the implementation strategy for plan recommendations.” The Scope of Work listed a number of key areas and activities to be considered:

- Long-term organized structure to ensure implementation, review progress, take corrective action, involve the public, report to entities, and respond to new needs or information;
- Long-term data collection, including monitoring and other measures to evaluate success;
- Funding and other resource needs including whether funding is available now and/or how the funding will be provided for each element of the plan;
- What special relationships, rule changes, agreements, contracts, or other arrangements, if any shall be established by or among the various parties involved in implementing the recommendation;
- What methods will be employed by each party to ensure their compliance with the requirement of the plan element(s) for which they are responsible; and
- Contingencies and processes for cases where an organization designated for implementing a plan recommendation is unable or unwilling to do so.

The purpose of this Section is to describe the actions being recommended to address these considerations and ensure plan implementation and future updates.

4.2 Governance Structure and Implementation Strategy

The WRIA 1 Governance and Implementation Strategy is a multi-approach strategy. It includes an Interim Strategy and Long-Term Strategy; both of which address the organizational structure, data collection, resource needs, and relationships between implementing entities as outlined in the March 2000 Scope of Work. The two remaining considerations in the March 2000 Scope of Work will be addressed as part of the Watershed Management Plan approval and adoption process. Related to those considerations, it is important to note that in accordance with the Watershed Management Act the Watershed Management Plan cannot include elements that create an obligation unless the government to be obligated is represented on the Planning Unit. Therefore, it is anticipated that as the Planning Unit is reviewing the WRIA 1 Watershed Management Plan – Phase 1, the representatives of caucuses associated with a recommended implementing government entity will be conferring with their caucus regarding accepting responsibility for an action. In cases where implementation involves a non-government entity, it is important to restate that the identified entity can not be obligated; the action is a recommendation and implementation is voluntary.

4.2.1 Approach for Developing the Governance Structure and Implementation Strategy

Parametrix initiated the process for developing a Governance Structure and Implementation Strategy by completing a literature survey and report on the different approaches that have been taken nation-wide for implementing watershed management plans. WRIA 1 participants used the report as a reference guide as they began discussions about an approach to implement the WRIA 1 Project Plan.

After providing the report to WRIA 1 participants, Parametrix conducted a series of meetings with participants to discuss options and receive feedback on options for a Governance Structure and Implementation Strategy for the WRIA 1 WMP. The approach expressed was to develop a structure that continues to represent a wide-range of water interests and that provides oversight and coordination of water resource management actions.

An Implementation Working Group comprised of staff from the Initiating Governments and a representative of the Small Cities Caucus continued to meet and assess options for achieving the overall approach in the context of resource needs and organizational structures that would continue to respect the government-to-government relationship required by the tribes to participate.

The outcome of the Implementation Working Group's discussions resulted in a recommendation for a multi-strategy approach to governance and implementation. The approach includes an interim strategy that will be the focus of WRIA 1 Watershed Management Plan implementation activities in 2005 and 2006. The interim strategy enables the WRIA 1 Project to continue after WMP approval using limited financial resources. This interim strategy will remain in place until the long-term strategy is implemented. The long-term strategy will need to be finalized in 2005 and 2006. One of the recommendations put forth by the Working Group is based on the approach of a single management entity with a dedicated funding source. This vision (and possibly others) will need to be further discussed and refined early in 2005, along with the funding options necessary to support it. To this end, the Working Group developed a concept paper in December 2004 that advocates establishing a small county-wide property tax levy dedicated to funding the local water resource management program. The concept paper was distributed to the WRIA 1 Planning Unit in January 2005 and will be circulated among community decision-makers in early 2005 in an effort to begin the discussions necessary to support a dedicated funding mechanism. The Working Group will develop a timetable in spring 2005 for pursuing the concept of a dedicated funding source with the goal being to obtain funding for 2007. The timetable should take into consideration the Planning Unit's reduced meeting schedule and obtaining agreements of local governments necessary to implement the funding source. It is anticipated that an agreed upon strategy will be achieved and activated in 2007, including the funding mechanism to achieve WRIA 1 Project implementation.

It is expected, however, that putting the long-term strategy in place will be dependent on obtaining local and other funding that will be pursued as part of the 2005-2006 work plan. During the latter part of 2006, program and project recommendations will be reviewed for

purposes of developing the 2007-2009 WRIA 1 Project work plan. It is expected that review of the long-term strategy and proposed structure will also take place and a determination made as to whether the resources exist to move it forward.

4.2.2 WRIA 1 Interim Strategy and 2005-2006 Work Plan

The Interim Strategy is designed around the activities that can be achieved under a two-year work plan with limited resources; the 2005-2006 WRIA 1 Work Plan. This strategy retains the organizational structure that existed during plan development; this includes the Joint Board, Planning Unit, Staff Team, Instream Flow Working Group, and Technical Teams. Although the organizational structure will remain the same, the processes for the groups will be modified to reflect the reduced level of funding. These modifications are described later in this section. The interim strategy also provides the time needed for WRIA 1 participants to identify the long-term governance structure and pursue options for securing dedicated funding for the long-term strategy. The 2005-2006 Work Plan that will be the focus of activities undertaken as part of the Interim Strategy are described in Section 5.

The specific goals for the Interim Strategy include:

- Receiving, reviewing, and approving Utah State University technical products.
- Implementing the Bertrand and Middle Fork Instream Flow Pilot Negotiations
- Supporting implementation of a WRIA 1 Long-Term Monitoring Plan.
- Acquiring implementation grant funding to support WRIA 1 Project efforts.
- Pursuing options for dedicated funding for WRIA 1 Project
- Pursue Federal appropriation funds to support Plan implementation
- Implementing the 2005-2006 WRIA 1 Work Plan

It is anticipated that resource needs under the Interim Strategy will be met in the following ways: 1) reduce WRIA 1 meeting frequencies, which reduces associated support needs, 2) continue using existing Joint Board staff for specified tasks where possible and to the extent available given other agency program needs, 3) implement activities identified for

funding under the 2004 Whatcom County WRIA 1 budget supplemental, and 4) pursue a Washington State Department of Ecology Implementation Grant.

Interim Strategy Modifications

As previously discussed, there are no proposed changes to the organizational structure for the Interim Strategy; the Joint Board, Planning Unit, Instream Flow Working Group, Staff Team, and Technical Teams will be retained. The processes for these entities, however, will be modified to reflect reduced levels of funding. Following are anticipated modifications to the entities' processes.

Joint Board – The composition of the Joint Board and modifications to the Joint Board's process are not anticipated. Meeting frequency will continue to be on an as needed basis for purposes of providing approvals and policy direction, when applicable.

Planning Unit – The composition of the Planning Unit with respect to caucuses represented will not change. Modifications to the Planning Unit processes include a reduction in meeting frequency. It is anticipated that the Planning Unit will have up to four (4) facilitated meetings per year. Scheduled meetings will be for the primary purpose of considering recommendations relative to instream flows or to the Federal/Tribal settlement negotiations, legislative changes, and formal WRIA 1 Watershed Management Plan updates. Opportunities for feedback and input from the Planning Unit on WRIA 1 WMP implementation activities outside of the scheduled facilitated meetings will be provided through a variety of communication methods including: monthly posting of implementation activities to the WRIA 1 Project website; quarterly distribution of a simple newsletter to update WRIA 1 participants on program and project status; email notifications of events, meetings, and other notable activities as appropriate; posting of Staff Team meeting summaries to the WRIA 1 Project website; and occasional informal, non-facilitated Planning Unit meetings to receive feedback from and/or provide updates to Planning Unit and other WRIA 1 participants. Planning Unit members are also encouraged to contact members of the Staff Team, and in particular the Staff Team chair, if they have comments or concerns that arise through their review of the various update mechanisms. The composition of the Planning Unit with respect to interests represented will not change.

Instream Flow Working Group – The composition of the Instream Flow Working Group and modifications to the Group’s processes are not anticipated. It is expected that the primary efforts of this WRIA 1 group will be focused on the Instream Flow Pilot Negotiation projects and continuing efforts to define and pursue local dedicated funding mechanisms for purposes of the long-term strategy for WRIA 1 Project management.

Staff Team – The composition and function of the Staff Team will not change as part of the Interim Strategy. The primary change to the Staff Team’s process is a change in meeting structure and support. Meeting frequency will be reduced to monthly with note-taking to be provided by the Staff Team meeting chair. Meeting summaries will be posted to the WRIA 1 Project website as a way of maintaining a predictable flow of information on WRIA 1 project administrative discussions to interested WRIA 1 participants. The posting of the summaries is a new change in function intended to help address any information gaps that may occur with the reduction of formal Planning Unit meetings as discussed previously. It should also enable Project participants to remain informed about the progress on activities so that, if there are concerns or comments, they can be provided to the Staff Team chair for consideration by the group.

Technical Teams – The composition of the Technical Teams is not expected to change. The Technical Teams will continue to meet on an as needed basis. Technical Team Leads will be responsible for documenting actions taken at meetings. Meeting actions will be posted on the WRIA 1 project website as a way to maintain information flow to all WRIA 1 participants.

4.2.3 WRIA 1 Long-Term Strategy

The long-term strategy for the WRIA 1 Project envisions a single management entity providing the structure for long term water resource management. The structure that is envisioned will continue to include representation of a wide-range of water interests; involve federal, tribal, state, and local governments; and provide community members with opportunities to become involved in managing water resources in WRIA 1. It is recognized that achieving this vision will require a secured local funding mechanism. Securing this mechanism requires several months of planning to both define an approach and to receive

public and political support. Therefore, although the actual implementation of the long-term vision is not planned to occur in the 2005-2006 work plan that is the focus of this WRIA 1 WMP- Phase 1, the efforts to identify and pursue the funding mechanism is part of the 2005-2006 strategy. To this end, the Working Group developed a concept paper in December 2004 that advocates establishing a small county-wide property tax levy dedicated to funding the local water resource management program. The concept paper was distributed to the WRIA 1 Planning Unit in January 2005 and will be circulated among community decision-makers in early 2005 in an effort to begin the discussions necessary to support a dedicated funding mechanism. The Working Group will develop a timetable in spring 2005 for pursuing the concept of a dedicated funding source with the goal being to obtain funding for 2007. The timetable should take into consideration the Planning Unit's reduced meeting schedule and obtaining agreements of local governments necessary to implement the funding source.

Review and definition of the structure for the long-term strategy is also included as part of the Interim Strategy for the 2005-2006 WRIA 1 Work Plan. The structure that was proposed in Section 4 of the Preliminary Review Draft WRIA 1 WMP (March 2004), which includes a core of 3 to 4 dedicated technical and management staff, will serve as the basis for initiating those efforts. If a funding mechanism is secured prior to completion of the 2005-2006 Work Plan, review and definition of the long-term strategy may be initiated sooner than the mid-2006 timeframe that is currently anticipated.

4.3 Adaptive Management

Adaptive management is a process that can allow organizations to acknowledge and deal with uncertainty within a deliberate decision making framework. It is a process that facilitates the use of best available science in influencing public policy¹.

¹ This statement and the simplified figure illustrating adaptive management come from a description provided by Parametrix when they developed the WRIA-wide Program Natural Resource Policy Integration. Because it applies to all of the programs, it was used in this section of the Plan and referenced in each management recommendation.

The March 2000 Scope of Work specifies the use of adaptive management in the Watershed Management Plan's implementation and provides a description of the process. A simplified version of the process is provided in Figure 4.1.

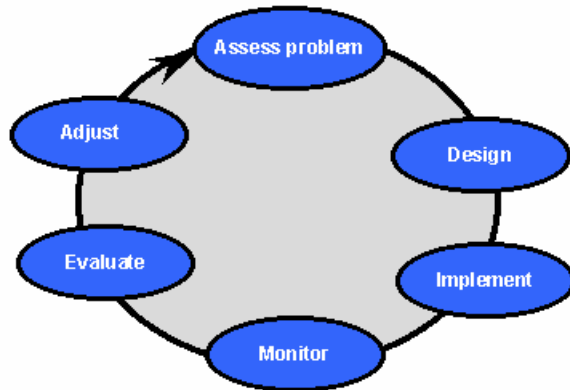


Figure 4.1: Adaptive management process (graphic taken from the British Columbia, Ministry of Forests, web site - www.for.gov.bc.ca/hfp/amhome/Amdefs.htm)

This 6-step cycle is initiated with the assessment phase during which time the problem(s) are identified. This is the step represented by the technical work conducted for the WRIA 1 Project. During the design stage, actions are developed to address the problems identified in Step 1. The management recommendations provided in Section 3 are at the design stage. Once there is agreement on the management action(s), they will be implemented (Step 3) and their results monitored using the performance measures identified for each (Step 4). The performance measures are then evaluated against the performance goals established (Step 5). If the evaluation is favorable, the action will continue without modification. If the activity is failing to meet the established goals, adjustments will be needed (Step 6).

This process will be used to guide overall implementation of the WRIA 1 WMP and will be used to evaluate and adjust (as needed) each of the management actions implemented. Through this process new recommendations may be provided as the Plan is updated in the future as described in Section 4.3.

SECTION 5

SUMMARY OF 2005/2006 IMPLEMENTATION ACTIONS

The WRIA 1 Watershed Management Plan – Phase 1 provides a road map for long-term comprehensive water resource management in WRIA 1. The initial focus of the WRIA 1 Watershed Management Project is on actions to be implemented in 2005 and 2006. These recommended actions are described in Sections 2, 3, and 4 of the Plan. A summary of these actions is provided in Table 5.1 along with information on schedule, resource needs, and lead for implementation of the activity. The actions are listed in the order in which they appear in the Plan, beginning with recommendations provided in Section 2, Technical Assessment, and ending with those appearing in Section 4, Governance and Implementation.

For each of the recommended actions, information is provided on potential funding needs. As noted previously, the 2005/2006 activities were selected in part based on actual or likely potential resources. In a number of cases, resources are identified for initial implementation (i.e., 6 months to 1 year) with continuation of efforts requiring that additional resources be obtained. A focused effort in 2005 will be needed to pursue local, state, and/or federal funds to complete implementation of many of the activities. If funding is not obtained, actions will not move forward as currently proposed.

Program leads are identified for each activity, at least in the initial (i.e., 6 month) stages. Where funding is not available beyond the initial stages, the lead may not be identified or known. The source of funding, if obtained, will need to include a determination of a lead for continued implementation of the activity.

<i>Funding Sources</i>
<p><i>Known Funding</i></p> <ul style="list-style-type: none"> • <i>Whatcom County previously allocated funding (Technical Work, some facilitation)</i> • <i>Whatcom County 2004 Supplemental Budget (mainly supports implementation of Bertrand Instream Flow Pilot program)</i> • <i>Ecology funding to support mediation for Instream Flow pilots</i> • <i>PUD Contract Support for Technical Work</i>
<p><i>Potential Funding</i></p> <ul style="list-style-type: none"> • <i>Ecology Phase 4 Implementation funding (\$100,000/year up to 5 years)</i> • <i>Local dedicated funding</i> • <i>Federal appropriation</i>

Table 5.1: 2005/2006 Implementation Summary

Implementation Actions		Schedule		Potential Funding Source ¹	Activity Lead ²
		2005	2006		
Complete Phase III Technical Work		Model Completion, peer review, technology transfer, contract admin support		Existing- Joint Board Budget Allocation Public Utility District No. 1 (Admin Contract Support)	Whatcom County
Decision Support System		Define administrative and institutional framework	On-going maintenance/update of database, models; training new users	Pursue Ecology Implementation Grant	Staff Team
Deferred Phase III Work	• Ground Water Models	Define and Implement modeling (scope of area may encompass Instream Flow Bertrand Pilot Negotiation area)	Continue ground water modeling	2004 Whatcom County Supplemental	Whatcom County
	• South Fork Temperature & High Resolution Surface Water Quality Model	No Action 2005	Revisit need for high-resolution models in work program update.	To be determined as part of 2006 update	To be determined as part of 2006 update
Socioeconomic		Monitor socioeconomic analysis that may be occurring within WRIA (e.g. County, Port of Bellingham, Cities)	Revisit needs in work program and coordinate with related local efforts.	<ul style="list-style-type: none"> Refer to Update/Communication Support for monitoring activities. To be determined as part of 2006 update 	<ul style="list-style-type: none"> Refer to Update/Communication Support Joint Board Working Group will pursue resources for continued work.
Instream Flow Action Plan	• Bertrand Drainage Instream Flow Pilot	Implement Bertrand Instream Flow Pilot Negotiations	Continue implementation of Bertrand Pilot	<ul style="list-style-type: none"> 2004 Whatcom County Supplemental Washington State Department of Ecology for mediator funds 	<ul style="list-style-type: none"> PUD through interlocal with Whatcom County and in coordination with Bertrand Watershed Improvement District. Washington State Department of Ecology contract with mediator
	• Middle Fork Instream Flow Pilot	Implement Middle Fork Instream Flow Pilot Negotiation	Continued implementation of Middle Fork Pilot	<ul style="list-style-type: none"> Washington State Department of Ecology for mediator funds City of Bellingham 	<ul style="list-style-type: none"> Washington State Department of Ecology contract with mediator City of Bellingham/Instream Flow Working Group
	• Revise Instream Flow Selection & Adoption Action Plan	No Action 2005	Review results of both Instream Flow Pilot Negotiations and make changes as needed to the Instream Flow Selection and Adoption Plan Version 6c.	Revisit potential funding needs in preparation for updating Version 6c.	Instream Flow Working Group
Pilot Programs	• Drainage-based Management	Track/monitor success in relation to Instream Flow Pilots (Bertrand/Middle Fork), and Tenmile Drainage; provide updates	Consider how to proceed with actions in other drainages as part of work program update.	<ul style="list-style-type: none"> Refer to Update/Communication Support for monitoring activities. Potential future funding needs to be determined as part of 2006 update. 	Refer to Update/Communication Support
	• East Hemmi	Track and monitor success; provide updates	Track and monitor success.	Refer to Update/Communication Support for monitoring activities.	Refer to Update/Communication Support
	• Ground Water Augmentation	Track/monitor actions in Bertrand Watershed Improvement District and Instream Flow Pilot Negotiation areas; provide updates	Revisit overall program and determine next steps for work program update	Refer to Update/Communication Support for monitoring activities.	Refer to Update/Communication Support
	• County Facility and/or Road Low Impact Development	<ul style="list-style-type: none"> As part of 6-year road program and capital facility planning, the County seeks to identify and monitor a specific road and/or capitol facility project for incorporation of low impact development techniques and uses the information to inform development of low impact development practices in WRIA 1. State seeks to identify and incorporate low impact practices at the Guide Meridian road project 	<ul style="list-style-type: none"> Continue 2005 efforts Revisit overall program and determine next steps for work program update 	Activities to be done with the leads' existing program resources (at least initially).	<ul style="list-style-type: none"> Whatcom County Washington State Department of Ecology as state caucus rep

¹ Potential funding sources will be further refined as additional information becomes available.

² The "Activity Lead" is the entity envisioned to be where the activity initiates, is managed, and/or facilitates coordination with the WRIA 1 project participants involved in the listed activity (e.g., Working Group, Tech Team, etc.) and other affected parties. Additionally, the named entity represents a proposal for the lead for the activity; obligations for fulfilling this role have not been pursued at this time.

Implementation Actions		Schedule		Potential Funding Source ¹	Activity Lead ²
		2005	2006		
WRIA Wide Programs	<ul style="list-style-type: none"> Compliance 	<ul style="list-style-type: none"> Continue WRIA 1 wide water rights education efforts, including focused education and technical assistance in instream flow pilot negotiation areas. Whatcom County focus on Shoreline Program and Critical Areas Ordinance enforcement and effectiveness evaluation Whatcom County works with cities to develop coordinated education effort related to Shoreline Program and Critical Areas Ordinance Initiate efforts to address goals 3 – 6 	<ul style="list-style-type: none"> Continue 2005 efforts Revisit overall program and determine next steps for work program update 	<ul style="list-style-type: none"> Water rights resource needs to be determined as part of the instream flow pilot project efforts Focus of Shoreline Master Program and Critical Areas Ordinance effort will be done with lead's existing program resources (2nd, 3rd bullets) Initiation of action related to goals 3 – 6 to be integrated with instream flow pilots work. 	<ul style="list-style-type: none"> Department of Ecology in coordination with Instream Flow pilot project participants Whatcom County Refer to Instream Flow pilots
	<ul style="list-style-type: none"> Natural Resource Policy Integration 	<ul style="list-style-type: none"> Whatcom County focuses on integration of the following programs/efforts: WRIA 1 Project, Salmon Recovery, Shoreline Program, Critical Areas, and Parks, Recreation and Open Space. 	<ul style="list-style-type: none"> Continue 2005 efforts Develop matrix/report summarizing inconsistencies/gaps Revisit overall program and determine next steps for work program update 	<ul style="list-style-type: none"> 2005 and 2006 actions will be accomplished with existing County resources. The summary of inconsistencies and gaps may require additional resources – the County will pursue if needed. 	<ul style="list-style-type: none"> Whatcom County
	<ul style="list-style-type: none"> Water Use Efficiency 	<ul style="list-style-type: none"> Pursue within Instream Flow Pilot Negotiation areas as determined to be appropriate 	<ul style="list-style-type: none"> Revisit overall program and determine next steps for work program update with consideration given to new Washington State Department of Health requirements. 	<ul style="list-style-type: none"> Portion of 2004 Whatcom County Supplemental and existing grant from Washington State Department of Ecology to Bertrand Watershed Improvement District if desired Funding for 2006 review to be determined 	<ul style="list-style-type: none"> Whatcom County via contracts with Public Utility District No. 1 & Bertrand Watershed Improvement District (WID; Ecology via grant to Bertrand WID 2006 review to be determined
	<ul style="list-style-type: none"> Public Involvement and Education 	<ul style="list-style-type: none"> Initially focus within Instream Flow Pilot Negotiation areas and other areas as funding allows 	<ul style="list-style-type: none"> Continue Revisit overall program as part of work program update 	<ul style="list-style-type: none"> Portion of 2004 Whatcom County Supplemental and staff from Washington State Department of Ecology for pilot negotiation areas; Pursue implementation grant 	<ul style="list-style-type: none"> Refer to Instream Flow pilots for Bertrand and Middle Fork Lead to be determined for WRIA-Wide efforts as funding allows
	<ul style="list-style-type: none"> Low Impact Development 	<ul style="list-style-type: none"> County continues existing efforts to develop watershed-based regulations and pursue capital facility planning that incorporates opportunities for low impact development practices. Other jurisdictions continue existing efforts. Monitor progress on low impact development pilot project for consideration in future WRIA-wide actions 	<ul style="list-style-type: none"> Continue 2005 efforts. Revisit overall program and determine next steps for work program 	<ul style="list-style-type: none"> Implement with existing lead staff and/or as funding allows 	<ul style="list-style-type: none"> Whatcom County
Other Programs	<ul style="list-style-type: none"> Feasibility Deep Aquifer Storage; Trans-basin Importation; Water Transfer Procedures & Challenges Water Banking Survey; Water Rights Information Center; Water Reuse 	<ul style="list-style-type: none"> Implementation of these programs will be considered only as part of the Instream Flow Pilot Negotiation projects as appropriate. 	<ul style="list-style-type: none"> Revisit as part of work program update and determine which, if any, should be pursued 	<ul style="list-style-type: none"> To be determined 	<ul style="list-style-type: none"> To be determined
Lake Whatcom		<ul style="list-style-type: none"> Priority for Lake Whatcom Management Program per adopted Lake Whatcom Plan. 	<ul style="list-style-type: none"> Continue 	<ul style="list-style-type: none"> Occurs through Lake Whatcom Management Program 	<ul style="list-style-type: none"> Occurs through Lake Whatcom Management Program
Long Term Monitoring Program	<ul style="list-style-type: none"> Support existing programs (e.g. enhanced ambient water quality monitoring/Centennial grant; gaging) 	<ul style="list-style-type: none"> Implementation of water quality monitoring and related activities; Pursue resources to continue gaging stations currently funded through Lummi Nation funding (ends Sept 05). 	<ul style="list-style-type: none"> Continued monitoring as funding allows – identify actions and resources to continue for inclusion in work program 	<ul style="list-style-type: none"> Enhanced water quality work conducted with existing Centennial grant funds thru Aug 06; Enhanced gaging through Lummi funding expires Sept 05. Future resources to be determined. 	<ul style="list-style-type: none"> Enhanced water quality – Whatcom County Enhanced Gaging – Lummi Nation Future lead(s) to be determined.
	<ul style="list-style-type: none"> Enhance accuracy of water use information 	<ul style="list-style-type: none"> Receive annual updates from Ecology and integrate into DSS; further refinement in ISF Pilot areas as needed 	<ul style="list-style-type: none"> Continued in 2006 	<ul style="list-style-type: none"> Existing program resources of the lead entity 	<ul style="list-style-type: none"> Washington State Department of Ecology
	<ul style="list-style-type: none"> Develop comprehensive long-term strategy 	<ul style="list-style-type: none"> Continue assessment of needs. 	<ul style="list-style-type: none"> Develop strategy and funding needs for inclusion in work program 	<ul style="list-style-type: none"> Pursue Implementation Grant 	<ul style="list-style-type: none"> To be determined

¹ Potential funding sources will be further refined as additional information becomes available.

² The “Activity Lead” is the entity envisioned to be where the activity initiates, is managed, and/or facilitates coordination with the WRIA 1 project participants involved in the listed activity (e.g., Working Group, Tech Team, etc.) and other affected parties. Additionally, the named entity represents a proposal for the lead for the activity; obligations for fulfilling this role have not been pursued at this time.

	Implementation Actions	Schedule		Potential Funding Source ¹	Activity Lead ²
		2005	2006		
Governance and Administration	Meetings (includes meeting support)				
	• Planning Unit (2005 – 4 mtgs; 2006 - semi-annual & as needed)	<i>Dates to be determined.</i>	<i>Continued</i>	<i>Existing funds will support 1 year (4 meetings). Pursue implementation grant to support future meetings.</i>	<i>Whatcom County for existing funds. Future meetings lead to be determined.</i>
	• Staff Team (1/month & as needed)	<i>Dates to be determined as needed and funding allows.</i>	<i>Continued</i>	<i>2004 Whatcom County Supplemental for 6 months (est.). Pursue implementation grant to support future meetings.</i>	<i>PUD through interlocal with County for first 6 months. Future lead to be determined</i>
	• Technical Teams (6/year & as needed)	<i>Dates to be determined as needed and funding allows.</i>	<i>Continued as needed for USU work.</i>	<i>Relies upon continued use of existing staff/participants.</i>	<i>Existing chairs will continue</i>
	• Instream Flow Working Group (2/year)	<i>Dates to be determined as needed and funding allows.</i>	<i>Continued</i>	<i>Pursue implementation grant</i>	<i>Instream Flow Working Group will need to determine</i>
	• Joint Board (2/year & as needed)	<i>Dates to be determined as needed and funding allows.</i>	<i>Continued</i>	<i>Pursue implementation grant</i>	<i>Staff Team/Instream Flow Working Group</i>
	Pursue Funding				
	• Local	<i>Refine estimates of local funding needs, identify/prioritize options for obtaining, and pursue.</i>	<i>Continue pursuit of local funding for use in work program update.</i>	<i>Existing Staff</i>	<i>Initiating Governments</i>
	• State	<i>Pursue annual State \$100,000 implementation funds</i>	<i>Pursue additional annual \$100,000 implementation funds from State</i>	<i>2004 Whatcom County Supplemental will provide funds for writing grant</i>	<i>PUD through interlocal with Whatcom County</i>
	• Federal	<i>Pursue Federal funding/appropriations – emphasis on Instream Flow Plan³</i>	<i>Continued pursuit of Federal funds</i>	<i>Instream Flow Working Group will need to determine what resources are needed</i>	<i>Instream Flow Working Group</i>
	• Caucus	<i>Pursue support for caucuses</i>	<i>Continue</i>	<i>Pursue implementation grant</i>	<i>To be determined in writing grant</i>
	Updates and Communication Support				
	• Website	<i>On-going, regular update of website with status of implementation actions & minutes</i>	<i>Continued</i>	<i>2004 Whatcom County supplemental will provide initial funds (est. 6 months); pursue implementation grant to support continued updates</i>	<i>Initially the PUD will implement through an interlocal with Whatcom County; Future implementation to be determined</i>
	• Newsletter/mailings	<i>Quarterly newsletter; mailings as needed</i>	<i>Continued</i>	<i>2004 Whatcom County supplemental will provide initial funds (est. 6 months); pursue implementation grant to support continued updates</i>	<i>Initially the PUD will implement through an interlocal with Whatcom County; Future implementation to be determined</i>
• Email notices and correspondence with caucuses	<i>ongoing</i>	<i>Continued</i>	<i>2004 Whatcom County supplemental will provide initial funds (est. 6 months); pursue implementation grant to support continued updates</i>	<i>Initially the PUD will implement through an interlocal with Whatcom County; Future implementation to be determined</i>	
Annual Report and Work Program Update	<i>Implement 2005/2006 work program and provide annual update report; initiate 2007/2008 work plan.</i>	<i>Provide 2006 annual update report; complete 2007/2008 work plan.</i>	<i>Pursue implementation grant</i>	<i>To be determined</i>	

¹ Potential funding sources will be further refined as additional information becomes available.

² The “Activity Lead” is the entity envisioned to be where the activity initiates, is managed, and/or facilitates coordination with the WRIA 1 project participants involved in the listed activity (e.g., Working Group, Tech Team, etc.) and other affected parties. Additionally, the named entity represents a proposal for the lead for the activity; obligations for fulfilling this role have not been pursued at this time.

³ Contingent on obtaining local funding support.

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The WRIA 1 Planning Unit documents included in Appendix A were downloaded from the WRIA 1 Project website (www.wria1project.wsu.edu) for purposes of adding it to the WRIA 1 Watershed Management Plan.

WRIA 1 WATERSHED MANAGEMENT PROJECT STRUCTURE AND FUNCTION

INTRODUCTION:

Within the next few months and years, decisions will be made and plans implemented regarding the water resources of the Nooksack River watershed and certain adjacent streams (Water Resource Inventory Area 1 or WRIA 1). These decisions and plans, along with the Growth Management Act and projects in response to the Endangered Species Act listing for Chinook salmon, will determine the landscape, the environmental health, and the economic future of Whatcom County and surrounding areas. Agencies of federal, tribal, and state governments are authorized to make these decisions, and many of these decisions are being formulated now. The state legislature, with agreements from federal agencies, has provided an opportunity for watershed management decisions to be made locally. The local opportunity was provided by the Watershed Management Act (ESHB 2514, RCW 90.82) of April 1998. This law provides that if local representatives in WRIA 1 can work together; make scientifically sound assessments of the problems; collaborate to form a Planning Unit; forge agreements among the affected parties; adhere to federal, tribal, state, and local laws; and create a comprehensive watershed management plan and implementation strategy, then the state agencies will accept the locally determined decisions. Federal agencies participating or represented in the planning project may also accept the applicable obligations included in the plan. The local Watershed Management Project began with a grant from the Department of Ecology in June 1998. In accordance with the intergovernmental Memorandum Of Agreement signed in October 1998, the first task of the Initiating Governments (described below) is to fully define the Planning Unit. An initial attempt to describe the structure and function of the Watershed Management Project was released on December 29, 1998. In response to comments received about the initial document, the structure has been refined and additional

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information provided on the Public Involvement and Education plan and caucus formation and function. A new schedule for formation of the Planning Unit is also being developed. This report presents the refined structure and function of the Planning Unit and the other elements of the Watershed Management Project. This document does not, however, change or waive any rights of the Initiating Governments under ESHB 2514.

If local elected and appointed decision-makers can succeed at working together, they will determine how water resources in WRIA 1 are managed. If local decision-makers cannot cooperate and plan together, the state, tribal, and federal governments will make the necessary water resource management decisions. The stakes are enormous. Everyone's pocketbook and quality of life will be affected. The decisions will affect water quality, salmon habitat, jobs, farms, cities, and households. Here is a partial list of questions to be addressed:

- Will there be reliable supplies of safe drinking water in Whatcom County?
- What actions are necessary to achieve water quality standards throughout WRIA 1?
- What new rules will apply to the operation of dairies, other farms, industry, municipal waste treatment systems, and septic systems? What storm water management systems will be needed and how will they be built?
- Will water be available for future growth of agriculture, industry, small cities, housing, and water districts? Will we build reservoirs and water storage facilities?
- Will there be enough water for our existing farms?
- How much water is needed for fish and other instream resources? How much money will be needed to pay for new systems and how will it be raised?
- If local Watershed Management Act planning does not succeed, how much money will be consumed by legal battles?

The Initiating Governments are committed to addressing these and other long-standing water resource management issues. These governments have assembled a capable Staff Team that is action oriented and has learned the lessons of past water resource planning efforts. The Watershed Management Act may provide the last opportunity for local decision-makers to

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plan and implement necessary water resource solutions. Now is the time to trust, cooperate, and work together.

THE WATERSHED MANAGEMENT ACT PLANNING PROCESS:

The attached diagram labeled “WRIA 1 Watershed Management Project” shows how the planning process will proceed. This structure and process was negotiated and defined with public comments and over the course of several meetings by the Initiating Governments (i.e., the City of Bellingham, the Lummi Nation, the Nooksack Tribe, Whatcom County, and PUD No.1 of Whatcom County). The Initiating Governments designed this process to achieve several important agreed-upon goals:

- The working process will be practical, orderly, and action oriented. The tribal principle of negotiating government-to-government must be honored and preserved.
- The interests of all affected governments (local, state, federal, and tribal) will be considered.
- Other water resource interests will be represented.
- The number of people at the table will be limited to a manageable size. Representatives on the Planning Unit must be working members, responsible for the needs of those they represent and for the tasks and work of the Planning Unit.
- Extensive public involvement will be encouraged, with ample opportunity for education, input, and obtaining information about the process.

In designing this planning process, the Initiating Governments were guided by the Watershed Management Act, instructional seminars and written guides to implementing the law, by public comments, and by the Memorandum Of Agreement between the City of Bellingham, the Lummi Nation, Whatcom County, and PUD No.1. They were also guided by the practical experience of those who have been involved in previous watershed planning efforts in Whatcom County. As the planning process proceeds, this previous experience will help the participants avoid the problems and capitalize on the strengths of past efforts.

The Indian tribes in WRIA 1, the Lummi Nation and the Nooksack Tribe, have taken a leadership role in this project, with a commitment to cooperation and collaboration. This tribal

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dedication and professionalism increases the probability of the project's success, and separates this effort from previous watershed planning efforts. The tribes have treaty rights that cannot be affected by state law. Their active participation in a watershed process created by state law is voluntary and demonstrates a good faith desire to cooperate with other governments.

COMPONENTS OF THE PLANNING PROCESS:

The attached diagram defines and describes the components and functions of the planning project. The arrows between the components in the diagram mostly represent the flow of information, communication, and feedback, and should not be confused with organizational charts that depict lines of authority and reporting responsibility. This process must be a collaborative effort, characterized by cooperation, trust, and mutual support if it is to succeed.

In the large box in the middle of the diagram are the Administrative Decision-Makers and the Staff Team of the Initiating Governments. This represents a part of the government-to-government structure required by the Lummi Nation and the Nooksack Tribe. This group will design, coordinate, and support the planning process. The Staff Team will coordinate the day-to-day functioning of the planning process and assist in formulating and carrying out the designs and decisions of the Administrative Decision-Makers. Together the Administrative Decision-Makers and the Staff Team will determine the overall structure of the planning project, determine the scope of work, organize and coordinate the Technical Teams, design and implement Public Involvement and Education (PIE), select and provide support staff, administer budgets and contracts, facilitate the Planning Unit, and communicate with the councils of the Initiating Governments.

The large box at the bottom of the diagram represents the Planning Unit. This body will facilitate the contribution of knowledge, technical expertise, funding, equipment, and other resources, and thereby contribute to the technical assessments and tasks necessary for knowledge-based decision making. In addition to assisting with the work of the project, representatives on the Planning Unit will be responsible for expressing the interests of their constituents. Participants on the Planning Unit will be the staff representatives for the General

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Purpose Governments, and representatives of Water Resource Interests, which are explained more fully below.

Whatcom County is the Lead Agency for the Watershed Management Project. The role of the Lead Agency in this effort is administrative. The agency is to coordinate and facilitate the watershed planning process. The Lead Agency will provide staff and receive and disburse funds for the execution of grants, contracts, and services as determined by consensus of the Initiating Governments. Whatcom County, as the general purpose government with county-wide taxing authority, is the rational source to fund the local portion of the Watershed Management Project. The Councils of the Initiating Governments are the elected policy makers who have the final approval authority for the watershed plan. These councils will also provide policy direction and feedback to both the Administrative Decision-Makers and the Staff Team.

STRUCTURE OF THE PLANNING UNIT:

The Planning Unit is comprised of representatives for General Purpose Governments and representatives for Water Resource Interests. Technically qualified professional staff will be appointed to represent the Initiating Governments on the Planning Unit. The other three general purpose governments (state agencies, federal agencies, and small cities) will determine a method to select and each appoint a representative to participate. Water Resource Interests will each form a local caucus group and select a representative. To ensure that a manageable size is maintained, only one representative from each General Purpose Government and caucus will actively participate in the Planning Unit meetings. Meetings of the Planning Unit will be run efficiently in accordance with an agenda of issues distributed well in advance. Planning Unit meetings will be open to the public for observation, but will not be conducted as open public forums. There will be regularly scheduled opportunities in other contexts for general public comment and input. Caucuses: Water Resource Interests.

Water Resource Interests, including Fishers, Agriculture, Forestry, Environmental, Land Development, Non-municipal Water Systems, Water Districts¹, Diking/Drainage Districts,

¹ It is important to note that although the Water Districts are included as a caucus within the "Water Resource Interest" group in this Structure and Function Document, they were subsequently placed within the "Government" group of the Planning Unit as illustrated in Section 1, Figure 1.2..

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and Private Well Owners will each have an opportunity to form a caucus and select a representative. The Port Authority will also be invited to select a representative for the Planning Unit.

It is anticipated that some of these caucuses may contain organizations and individuals with somewhat divergent views. In those instances where the caucus cannot come to speak with one mind on a given issue, it will be the responsibility of the caucus representative to present all of the divergent viewpoints fairly. Caucuses will need to organize themselves, direct their activities, and create means for communicating among the members and their designated representative. Each member organization in the caucus must be fairly informed, heard, and represented. Participation in a caucus provides an opportunity to assist the planning process and to express a viewpoint regarding issues. Some water resource organizations or individuals may participate in activities or businesses that overlap the interests of more than one caucus. In those instances, the people must choose to participate in one caucus that most closely represents their activities. Attempting to be represented by more than one caucus is not in keeping with the spirit and intent of the caucus system, and could lead to unfair abuse or manipulation of the process. The goal is to allow full representation of all viewpoints. If it becomes necessary, the Administrative Decision-Makers and/or the Planning Unit can be asked to resolve disputes arising from caucus representation issues. The formation and functioning of the caucuses will likely be a challenging process. Organizations and people who want to participate in the planning process will have to commit time and resources to the effort and come together with others of similar interests in a spirit of collaboration, fairness, and mutual support. Because the planning effort is a multi-year process, the caucuses must be defined and structured so as to withstand the rigors of long association and potentially contentious events. Representatives must be chosen carefully as these people will be expected to devote considerable time to the service of all of their members. The Initiating Governments intend to provide some support to the caucus organizations and to facilitate the formation of the caucuses. It would not be appropriate, however, for the Initiating Governments to assume responsibility for the formation and functioning of the caucus organizations. Each caucus is the responsibility of its members. Two addenda are provided with this document. Addendum 1, Public Involvement and

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Education, and Addendum 2, Caucus Formation and Function, describe some of the ways that the Initiating Governments will assist in the caucus and public involvement process.

Additional methods and resources for assistance may emerge as the Planning Unit and the caucuses begin to function and further define their needs and responsibilities. Planning Unit Decision-Making.

Within the text of the Watershed Management Act (ESHB 2514) the Planning Unit decision making protocol states:

“Upon completing its proposed watershed plan, the planning unit may approve the proposal by consensus of all of the members of the planning unit appointed to represent units of government and majority vote of the nongovernmental members of the planning unit.”

The large box at the bottom of the attached diagram, together with the associated function description, is intended to reflect the above language. Every effort will be made to apply “consensus” to all decision making within the entire Planning Unit. Only in the event it becomes necessary will the noted formal distinction between the General Purpose Governments (consensus required) and the Water Resource Interests (majority required) be utilized.

TECHNICAL TEAMS:

Much of the initial planning effort will consist of conducting technical studies designed to answer specific questions. The Staff Team will work with the Technical Teams to address questions related to water quantity, water quality, habitat, and instream flows. The Technical Teams, which may include consultants or researchers provided by federal or state agencies, will develop the technical assessments necessary for knowledge-based decision making. The Technical Teams will distribute updates and reports to the Planning Unit, and will at times conduct or assist in educational programs for the public and interested groups.

PUBLIC INVOLVEMENT AND EDUCATION:

It is essential that the general public have both easy access to information about water resource management decisions and multiple opportunities to participate in the project. The public needs to know the benefits that will be received from the expenditures for the project.

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Many interested citizens would also like to contribute to the process or to provide helpful and constructive comment and input. Finally, the public needs to be able to monitor the project and be satisfied that their diverse needs are being considered.

To ensure broad public participation, a Public Involvement and Education (PIE) team will be formed. This team will use a variety of methods, including public meetings and communication tools such as a telephone hotline and an Internet web page, to facilitate and encourage public awareness, participation, and input. Addendum 1, Public Involvement and Education, describes the specific programs that are currently anticipated. A Public Involvement and Education Coordinator will be hired by the Initiating Governments to lead this effort, and additional programs for public input may grow from experience in this area.

INITIAL TASKS OF THE PLANNING UNIT:

The Planning Unit will initially need to decide some of its own operating procedures and protocols. The functional tasks of the Planning Unit for approximately the first two years will primarily concern the data collection and analysis for the assessment phase of the project. Water allocation and supply issues are of paramount importance in this project, but before any knowledge-based decisions can occur, we must have accurate estimates of the amount of water available, the amount of water currently allocated, and the amount of water being used. This analysis will include determining how much water is consumed for beneficial uses compared with the quantity permitted for such uses. The Planning Unit will not immediately begin a process of negotiating future allocations.

FURTHER INFORMATION:²

The Watershed Management Project will soon provide a telephone hot line (Hotline number: (360) 676-6940) and an Internet web page. For now, please address any questions or comments, as well as information about the caucuses, to:

Barry Hill

WRIA No.1 Watershed Management Project

1000 N Forest Street, Suite 203

² Since this document was taken directly from the WRIA 1 Watershed Management Project website for inclusion in the Watershed Management Plan, the contact information is not current. Please refer to the Project website for current contact information (www.wrialproject.wsu.edu).

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Bellingham, WA 98225

Phone: (360) 676-6876

Fax: (360) 738-2468

email: bhill@co.whatcom.wa.us

Two addenda are attached to this document:³

Addendum 1, Public Involvement and Education

Addendum 2, Caucus Formation and Function

³ These addendums can be reviewed on the WRIA 1 Watershed Management Project website at www.wria1project.wsu.edu.



WRIA 1 Watershed Management Project

Final Scope of Work

March 27, 2000

**WRIA 1 Watershed Management Project
Scope of Work**

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¹ The following documents are referenced throughout this draft by their associated number. The purpose is to illustrate the relationship between the scope of work and regulatory/other requirements and agreements.

3/27/00

- 50 5. PU/IG direction
- 51 6. Presentation from Thomas Hardy
- 52 7. Existing draft SOW
- 53 8. Public Involvement and Education Conceptual Plan
- 54 9. Statewide Strategy to Recover Salmon: Extinction is not an Option

55 **Executive Summary**

56
57 Residents of Whatcom County are faced with an increasing number of challenges related to water
58 resources, despite what at times appears to be a seemingly abundant resource. These challenges
59 include limited water supplies to meet current and future needs, water quality degradation, and the
60 listing of Chinook salmon and bull trout as “threatened” under the Endangered Species Act (ESA).
61 Left unresolved, these issues will have a broad and far-reaching affect on the economic and
62 environmental health of the community.

63
64 In 1998 the State legislature passed Engrossed Substitute House Bill 2514, codified as RCW 90.82,
65 known as the Watershed Management Act. This Act included a grant-funding element requiring
66 completion of a Watershed Management Plan within four years of receipt of grant funding. The Act
67 provides a framework to better understand the nature and extent of water resource management issues
68 and to locally plan and implement solutions to identified problems.

69
70 Participation in the process is voluntary. In May 1998, Whatcom County, the City of Bellingham, and
71 the Public Utility District No. 1 of Whatcom County decided to engage in the process with the County
72 acting as lead agency. Pursuant to RCW 90.82, these three local governments invited the Lummi
73 Nation and the Nooksack Tribe to join the process. The Nooksack Tribe described their involvement
74 in the project through a July 1998 letter. After a Memorandum of Agreement (MOA) was signed by
75 the three local governments and the Lummi Nation in October 1998, both of the tribal governments
76 had joined the process. The MOA further defines the project objectives, participants, and the decision-
77 making process. Since May 1998, funding (grant and other) has been obtained, resources have been
78 allocated, and actions are underway based on requirements of the law, subsequently signed contracts
79 and agreements, and input from the local community. Together, the five Governments initiated public
80 involvement, water quantity, and instream flow work tasks, in parallel with the Planning Unit
81 formation work task. In May 1999 Planning Unit Caucuses were formed. In June 1999 the first
82 Planning Unit meeting was held.

83
84 The issues that will be addressed by the WRIA 1 Watershed Management Project include water
85 quantity, water quality, instream flows, and habitat. Project assessments and decision-making will
86 utilize best available science (3).

87
88 The purpose of this scope of work is to outline the general process, strategy, and actions necessary to
89 effectively manage water resources in WRIA 1. This scope of work includes actions taken to date. It
90 provides the framework from which more detailed work plans will be developed and approved by
91 appropriate entities. These work plans will include goals/objectives, specific tasks, budgets, who will
92 implement, work products, and schedules. Where appropriate, work plans will include design
93 parameters such as time step, probable error, and expected contribution to satisfying informational
94 needs. The standard established in the MOA is “best available science,” defined as objective and
95 repeatable analysis based on adequate empirical data collected with appropriate quality assurance/
96 quality control procedures in place.

97
98 In many cases, specific work plans will be developed and implemented under the guidance of
99 Technical Teams. Technical Teams will generally be composed of representatives from the Initiating
100 Governments and the Planning Unit or their designees, and other technical experts. The Technical
101 Teams will report to and receive direction from the Initiating Governments and Planning Unit.
102 Community members, private consultants, and/or local, state, tribal, federal government agencies may
103 be recommended by the Technical Teams to assist in developing and implementing work plans.

104
105 The approach taken with this scope of work reflects the requirements of the Watershed Management
106 Act, adopted agreements and contracts, recommendations from program participant (Initiating

107 Governments and Planning Unit), and the Guide to Watershed Planning and Management. This scope
 108 of work is designed to guide the development of a Watershed Management Plan for WRIA 1. The
 109 Plan may include elements deemed desirable by local planning participants that exceed the minimum
 110 requirements of the Act. This scope of work is a working document that may need to be refined as
 111 work progresses and more information is collected.

112

113 **1.0 Initiation**

114 **1.1 Background**

115 Beginning in 1998 and continuing over the next few years, decisions will be made and plans
 116 developed and implemented regarding the water resources of the Nooksack River watershed and
 117 certain adjacent streams (Water Resources Inventory Area 1 or WRIA 1). These decisions and plans
 118 will coordinate with the land use/resource management planning under the Growth Management Act,
 119 the Shorelines Management Act, and other similar Acts, along with planning/projects in response to
 120 the Endangered Species Act (ESA) listing for Chinook salmon and bull trout, and will largely
 121 determine the landscape, the environmental health, and the economic future of Whatcom County
 122 residents. Agencies of federal, tribal, state, and local governments are authorized to make these
 123 decisions. The state legislature, with agreements from federal agencies, provided an opportunity for
 124 watershed management decisions to be made locally.

125

126 In 1998 the State legislature passed Engrossed Substitute House Bill 2514, codified as RCW 90.82,
 127 known as the Watershed Management Act. The Act provides a framework to better understand the
 128 nature and extent of water resources issues and to locally plan and implement a variety of solutions to
 129 address those issues. More specifically, the Act requires the development and implementation of a
 130 Watershed Management Plan that:

131

- 132 • Balances the competing resource demands in the watershed;
- 133 • Provides for the economic well-being of the citizenry and community;
- 134 • Protects existing water rights;
- 135 • Is consistent with current law;
- 136 • Does not conflict with existing state statutes, federal laws including Endangered Species Act
- 137 (ESA) recovery actions, tribal laws, and tribal treaty rights; and
- 138 • Provides local citizens with the maximum possible input concerning their goals and objectives for
- 139 water resource management and development.

140

141 Participation in the process is voluntary. In May 1998, Whatcom County, the City of Bellingham, and
 142 the Public Utility District No. 1 of Whatcom County decided to engage in the process with the County
 143 acting as lead agency. Pursuant to RCW 90.82, these three local governments invited the Lummi
 144 Nation and the Nooksack Tribe to join the process. The Nooksack Tribe described their involvement
 145 in the project through a July 1998 letter. After a MOA was signed by the three local governments and
 146 the Lummi Nation in October 1998, both of the tribal governments had joined the process. The MOA
 147 further defines the project objectives, participants, and the decision-making process. Since May 1998,
 148 funding (grant and other) has been obtained, resources have been allocated, and actions are underway
 149 based on requirements of the law, subsequently signed contracts and agreements, and input from the
 150 local community. Together, the five Governments initiated public involvement, water quantity, and
 151 instream flow work tasks, in parallel with the Planning Unit formation work task. In May 1999
 152 Planning Unit Caucuses were formed. In June 1999 the first Planning Unit meeting was held.

153

154 The decision to engage in the Watershed Management Process was made because of the increasing
 155 number of water problems the community is facing. Competing demands for the finite water
 156 resources in WRIA 1 pose a host of interconnected, serious challenges that threaten to have a variety

157 of negative impacts to our environment and our economy. While these challenges have been
 158 recognized for years, the need to address them has now become imperative.

159
 160 The demands for water include the needs of fish for sufficient water in streams (known as instream
 161 flow) to enable migration and propagation. Since some local fish populations have been listed under
 162 the federal Endangered Species Act, we must find a means to ensure that there is sufficient water
 163 available for fish, or face federal sanctions. In addition, tribal treaty rights include the right to harvest
 164 fish at all usual and accustomed grounds and stations throughout WRIA1. Meanwhile, a growing
 165 human population means growing demands for water for farming, homes, businesses, and industries --
 166 demands that are largely going unmet, which in turn is limiting economic development.

167
 168 The quality of our water is also a problem. Human activities affect both surface and ground water
 169 quality and have lowered water quality below that necessary for people and for fish in some areas.

170
 171 The immediate challenge is to collect or generate sufficient information upon which to base rational
 172 water resource management decisions. We need to know how much water naturally occurs throughout
 173 the year, how much water is represented by both state and federal (including tribes) water rights and
 174 claims, how much water is already allocated, or how much additional water, if any, is available for
 175 other uses. In addition, the extent to which ground and surface are interconnected varies throughout
 176 the watershed and represents both a water resource management challenge and opportunity.

177
 178 Because all elements of the watershed management project -- quantity, quality, habitat, and instream
 179 flow -- are physically, chemically, and biologically interconnected throughout WRIA 1, any successful
 180 management plan needs to address all of these components.

181
 182 Because water resource issues and policies are both complex and contentious, a collaborative decision
 183 making model appears to hold the greatest promise for developing a water resource management plan
 184 that will be successful over time. This collaborative effort will be conducted in a manner that does not
 185 violate the government-to- government principles of the Indian Nation and Indian Tribe in WRIA 1.

186
 187 In March 1999, a preliminary draft scope of work was developed by the Initiating Governments. This
 188 initial draft identified a number of actions required by law that could be acted on while obtaining
 189 further input from the general public, Planning Unit, and others. The initial draft was presented to the
 190 public and Planning Unit when they began meeting in June. The Planning Unit recommended a
 191 number of modifications of the initial draft. This revised draft is much less detailed than the initial
 192 scope of work and is intended to provide a broader framework for the WRIA 1 Watershed
 193 Management Project. This revised scope of work incorporates those recommendations, adopted
 194 agreements and contracts, requirements of the Watershed Planning Act, and suggestions from the
 195 "Guide to Watershed Planning and Management." These documents are referenced throughout this
 196 draft and listed by a number as reference documents in the Table of Contents.

197
 198 1.2 Scope of the Watershed Planning Project

199 1.2.1 Geographic

200 The geographic scope of project is Water Resource Inventory Area 1 (figure to be added) and certain
 201 parts of Canada that drain to WRIA1. This area includes the drainage area of the Nooksack River and
 202 its tributaries, including portions of Skagit County which are drained by the South Fork of the
 203 Nooksack River. The area also includes the U.S. portions of the Abbotsford-Sumas Aquifer and the
 204 Sumas River drainage that extend into British Columbia. In addition, the study area includes several
 205 coastal drainages that drain water into marine waters along the coastline of Whatcom County. The
 206 study area includes the Lake Whatcom drainage.

207

208 1.2.2 Issues

209 The scope of issues to be addressed under the Act must include water quantity, but may also include
210 water quality, instream flows, and habitat. The Initiating Governments have chosen to address all four
211 issues/components in the WRIA 1 Watershed Management Project as they are inseparable. If, during
212 the course of their work, technical teams encounter new information which in their opinion, warrants a
213 modification of the Scope of Work to ensure their new information is adequately addressed, the
214 technical team shall propose an amendment to the Scope of Work for approval by the Planning Unit
215 and the Initiating Governments.

216

217 1.2.3 Time Frame

218 Under the Watershed Planning Act, a proposed plan that has been approved by the Planning Unit must
219 be submitted to the County within four years of the date that the Planning Unit first received funding.
220 For WRIA 1, the Watershed Plan must be submitted by June 30, 2002. Implementation, monitoring,
221 and evaluation of the Plan will continue indefinitely into the future.

222

223 1.2.4 Affected Parties

224 It is understood that all federal, tribal, state, and local governments with jurisdiction, as well as all
225 types of private water resource interests and their customers, clients, and members within WRIA1 and
226 hydrologically connected areas are affected parties. It has been determined, however, that it is in the
227 best interest of all affected parties that the membership of the WRIA 1 Planning Unit, as defined by
228 the Act, shall consist of the Initiating Governments (Whatcom County, City of Bellingham, PUD1,
229 Lummi Nation, and Nooksack Tribe), other governments (state agencies, federal agencies, small cities,
230 diking/drainage districts, and water districts), and Water Resource Interests caucuses (fishers,
231 agriculture, non-municipal water systems, forestry, environmental, land development, and private well
232 owners). It is extremely important that early on, and throughout this process, there is a clear
233 understanding of the extent to which the issues and interests of the governments and water resource
234 interests are addressed. Although the scope of work and goals/purposes have been written in a manner
235 that attempts to recognize those needs, each government and water interest will be responsible for
236 ensuring that as the Project progresses its interests are being addressed.

237

238 1.3 Implementation Strategy for Scope of Work

239 The purpose of this scope of work is to outline the general process, strategy, and actions necessary to
240 address water resource issues in WRIA 1, including the actions taken to date. It provides the
241 framework from which more detailed work plans will be developed and implemented. These work
242 plans will include goals/objectives, specific tasks, budgets, who will implement, work products, and
243 schedules. Specific tasks should be clearly linked to the requirements specified in the RCW, MOAs,
244 contracts, or other agreed upon documents (5). A distinction should be made if proposed actions
245 exceed the minimum requirements (5). Where appropriate, work plans will include design parameters
246 such as time step, probable error, and expected contribution to satisfying specific information needs
247 (5). Some of this may not be known until the work plans are implemented. The standard established in
248 the MOA is "best available science," defined as objective and repeatable analysis based on adequate
249 empirical data collected with appropriate quality assurance/ quality control procedures in place.

250

251 In many cases, Technical Teams will facilitate the development and implementation of specific work
252 plans. Technical Teams will generally be composed of representatives from the Initiating
253 Governments and Planning Unit or their designees, and other technical experts. Formation of the
254 Technical Teams must be approved by the PU and IGs. Representation on the Teams is determined by
255 each caucus/interest. The Technical Teams will report to and receive direction from the Initiating
256 Governments and Planning Unit. The Technical Teams may choose to develop and implement specific
257 work plans themselves or they may recommend that community members, private consultants and/or
258 government agencies assist. Once work plans are approved, consistent with the March 1999

259 “Administrative Decision-Makers and the Staff Team Roles and Operating Procedures,” updates will
260 be provided to both groups and the Planning Unit on a regular basis.

261

262 In some cases, actions and strategies may be developed without the use of Technical Teams. In those
263 situations, a similar review process will be followed with review and input provided by both the
264 Initiating Governments and the Planning Unit.

265

266 1.4 Planning Unit

267 Under the Watershed Planning Act, the Initiating Governments are charged with, among other things,
268 defining the composition of the Planning Unit. In March 1999, the Planning Unit composition was
269 defined in the administratively adopted “Structure and Function” document. Since that time the
270 Planning Unit has formed with water resource interests and other participants identified.

271

272 Implementation Strategy/Status

273 *The Planning Unit has been meeting on a regular basis since June 1999. Through these*
274 *meetings and other discussions it has become apparent that clarity is needed regarding the*
275 *role of the Planning Unit. More specifically, the Structure and Function document contains a*
276 *organization diagram that describes the composition and roles/functions of the various*
277 *players in the process. These descriptions have generated some confusion regarding the role*
278 *of the Planning Unit. Clarification to the organization diagrams needed to reflect the*
279 *combined understanding of the Initiating Governments and Planning Unit.*

280

281 *The Initiating Governments are developing a new organization diagram that will clarify the*
282 *role of the Planning Unit. The organization diagram will be brought to the Planning Unit for*
283 *input after the revised version is completed.*

284

285 **2.0 Organization of the Watershed Planning Project (Phase 1)**

286 The organizational phase outlines the general information and actions needed to support the technical
287 assessment, solutions evaluation, plan development, and implementation strategy.

288

289 2.1 Goal/ Purpose of the Watershed Management Project

290 The goals/purposes of the WRIA 1 Watershed Management Project are defined by the RCW and other
291 legal agreements such as the intergovernmental MOA signed in October 1998. In addition, the local
292 interests and needs of the public participating in the project have also shaped the project goals. As the
293 project evolves and new information is obtained, these interests/needs may be modified. A summary
294 of the public interests is provided in Appendix G.

295

296 2.1.1 General Purpose/Goals of the Watershed Management Project

297 In general, the goal of the WRIA 1 Watershed Management Project is to have water of sufficient
298 quantity and quality to meet the needs of current and future human generations, including the
299 restoration of salmon, steelhead, and trout populations to healthy and harvestable levels and the
300 improvement of habitats on which fish rely (9)².

301

302 2.1.2 Goals of the Watershed Management Project Components

² The WRIA 1 Planning Unit interprets that char and shellfish are also included in this goal, that improvement to habitat will focus on degraded habitats, and the term “fish” refers back to the groups listed earlier. This language is meant to be consistent with the goals and mandates of the 2496 process and the objectives of the salmon co-managers. Salmon co-management is defined in The Puget sound Salmon Management Plan, implemented under a 1985 Court order under U.S. v. Washington 384 F. Supp. 312 (W.D. Wash. 1974). The co-managers of the fisheries resources are defined as the State of Washington, Western Washington Treaty Tribes, and the federal government. For WRIA 1, the salmon co-managers are the Washington Department of Fish and Wildlife, Nooksack Tribe, and Lummi Nation.

303 More specifically, the Project will address the following specific goals/purposes for each of the four
 304 components identified in the Watershed Management Act and the intergovernmental MOA:

- 305
- 306 • Water Quantity: The goal of the water quantity component is to assess water supply and use and to
 307 develop strategies to meet current and future needs (1). The strategies should retain or provide
 308 adequate amounts of water to protect and restore fish habitat (9)², provide water for future out-of-
 309 stream uses and to ensure that adequate water supplies are available for agriculture, energy
 310 production, and population and economic growth under the requirements of the state's growth
 311 management act (1).
 - 312 • Water Quality: The goal of the water quality component is to ensure that the quality of our water is
 313 sufficient for current and future uses, including restoring and protecting water quality to meet the
 314 needs of salmon and shellfish (9)², contact recreational uses, cultural uses, protection of wildlife,
 315 providing affordable, safe domestic water supplies, and other beneficial uses. The initial objectives
 316 of the water quality management strategy will be to meet the water quality standards (3).
 - 317 • Instream Flow: The goal of the instream flow component is to supply water in sufficient quantities
 318 to restore salmon, steelhead, and trout populations to healthy and harvestable levels and improve
 319 habitats on which fish rely (9)².
 - 320 • Fish Habitat: The goal of the fish habitat component is to protect or enhance fish habitat in the
 321 management area (1) and to restore salmon, steelhead, and trout populations to healthy and
 322 harvestable levels and improve habitats on which fish rely (9)².

323

324 The approach used in this project will explicitly recognize that the four project components are
 325 interconnected to a high degree. Actions intended to affect change in one component may affect one or
 326 more of the components. The approach will capitalize on the interrelationships between the four
 327 identified project components by systematically integrating the data collection and analysis efforts.
 328 The effort will be coordinated with other resource management efforts such as land use/resource
 329 planning, flood management, Salmon Recovery Project (NEAT/2496), and a myriad of other similar
 330 efforts.

332 2.2 Criteria for Evaluating Proposed Solutions

333 In order to achieve the above goals, the WRIA 1 Watershed Management Project will initially develop
 334 a watershed management plan that identifies specific actions to address the water resource problems
 335 identified. It is anticipated that during the plan development, specific alternatives and
 336 recommendations will be considered. Specific criteria will be developed to assist in selecting the best
 337 alternatives. The following criteria are provided by the Guidance Manual and should be considered
 338 when establishing the criteria:

339 Effectiveness Criteria

- 341 • Overall Effectiveness – Among the alternatives considered, which do the best job of addressing
 342 the issue at hand?
- 343 • Cost Effectiveness – Which alternatives deliver “the most bang for the buck”, even if they do not
 344 completely address the issues of interest?
- 345 • Flexibility Over Time – Which solutions offer the ability to be readily modified over time, in
 346 response to changing conditions and new information?
- 347 • Potential Side Effects – Do some of the potential solutions appear to create new problems, or
 348 exacerbate existing problems?
- 349 • Equity Considerations-What are the differing effects on various groups and economic activities in
 350 the Management Area?

351

352 Feasibility Criteria

- 353 • Legal Authority – Do the implementing organizations have the authority to implement the
- 354 proposed solution? If not, can ordinances or rules be adopted to provide that authority?
- 355 • Approvals/permits – What approvals or permits will be required, especially by organizations not
- 356 represented on the Planning Unit. Are those approvals or permits likely to be granted?
- 357 • Cost and Funding Sources –How expensive is each alternative, and who will bear the cost? Will
- 358 funding sources be available, both in the short-term and long-term?
- 359 • Administration and Staffing –What organization will administer each solution? Do they have the
- 360 capabilities to do the job? Will additional staff be required?
- 361 • Integration with Related Program –How will each solution fit in with related programs and plans?
- 362 • Acceptability – Are solutions acceptable to participants, elected officials, and key outside
- 363 organizations (e.g., NMFS)?

364
365
366 *Implementation Strategy/Status*

367 *A Technical Team will be established to help develop specific criteria.*

368
369 2.3 Sub-basin Delineation and Prioritization

370 The Watershed Management Act requires that watershed planning be conducted for management areas

371 consisting of one or more WRIAs. This does not require, however, that equal resources or focus be

372 devoted to all areas within the management area. Within each WRIA, there may be sub-basins that

373 have differing priorities for technical assistance and management actions (7).

374
375 The entire WRIA is being evaluated in the WRIA 1 Watershed Management Project. Consistent with

376 basic principals of effective watershed management, sub-basins are being delineated within the WRIA.

377 The sub-basins will serve as geographic areas to gather and analyze information, solutions, and

378 management actions. Prioritization of work by sub-basins will be considered as the planning process

379 progresses and more information is obtained.

380
381 Many different sub-basin delineations have been completed previously by different organizations and

382 planning efforts in WRIA 1. The USGS is developing a sub-basin map of WRIA 1 as part of their

383 Phase I contract. The USGS delineations will be the foundation for defining appropriate sub-basins.

384 The delineations will allow for changes and flexibility in designations as field verifications are

385 completed and management implications are considered.

386
387 *Implementation Strategy/Status*

388 *A Technical Team has been established to support the sub-basin delineation effort. The Team*

389 *has developed a detailed work plan with products and a schedule. It is anticipated that a*

390 *preliminary map will be available by the end of April 2000.*

391
392 2.4 Linkage/Coordination with Existing and Potential Programs

393 A critical and required element of the watershed planning effort is to effectively use limited resources.

394 To preclude a “reinvention of the wheel” and to avoid potential conflicts, the project participants will

395 review, build upon, and coordinate with historic and current data, regulations, and programs (1,2).

396 Tracking and providing input to potential new local, state, tribal, or federal regulations and programs

397 that could affect the planning effort will also occur.

398
399 Historic, current, and potential new data, regulations, and programs should be considered in order to

400 (7):

- 401 • Coordinate data collection efforts – data collection is occurring through many different programs.
- 402 The quality (accuracy) of these data need to be evaluated and this information should be used

- 403 wherever possible prior to collecting additional data. When additional data are collected, efforts
 404 should be made to ensure that all parties needing the data are involved in the design of the data
 405 collection efforts and in ensuring that the quality is acceptable for all anticipated uses.
- 406 • Understand potential constraints on management options that may exist due to local, state, tribal,
 407 and federal requirements. The watershed plan developed under the Watershed Management Act
 408 does not supersede other federal, tribal, state, or local requirements. However, a well-done
 409 watershed plan can provide a framework for federal, tribal, state, or local agencies to modify
 410 existing or pending actions.
 - 411 • Coordinate potential funding. In some cases one or more programs may need the same
 412 information that is needed for the watershed planning effort. Costs may be significantly reduced
 413 by adequate coordination with other programs.
 - 414 • Consider appropriate implementation tools. In some cases, solutions may be best achieved by
 415 modifications to existing programs.
 - 416 • Determine how to handle proposed new actions that could affect the watershed plan. During the
 417 course of the watershed planning effort new local, state, tribal, or federal actions may be proposed.
 418 A strategy for ensuring that these potential new actions are coordinated with the WRIA 1
 419 Watershed Management Project.

420
 421 Some examples of the many programs and activities that need to be considered in developing a
 422 coordination strategy include: County-wide Planning Policies; Comprehensive Plans; Coordinated
 423 Water System Plans; Drinking Water Source Protection Plans; Shoreline Programs; Shellfish
 424 Protection Plans; Storm Water Programs; Ground Water Management; education and technical
 425 assistance programs, Salmon Recovery Plans; Instream Flow regulations; Critical Area regulations,
 426 and Flood Hazard Management Strategies.

427

428

Implementation Strategy/Status

429

*Initial efforts were taken in 1999 to develop a strategy to ensure coordination and linkage
 430 between programs and actions. These efforts were placed on hold for several months for a
 431 number of reasons including pending revisions to the initial draft scope of work and the
 432 Whatcom Creek fire. Recently, a group has been meeting to discuss how to best coordinate
 433 these efforts. The group is not an official Technical Team under the Watershed Management
 434 Project however, their work may be used to help develop a strategy to ensure adequate
 435 linkage and coordination.*

436

437 **2.5 Information/ Data Management Program**

438

An important part of the Watershed Management Project is to establish a program to assist in the
 439 collection, storage, maintenance, retrieval, analysis, distribution, and display (e.g., maps and charts) of
 440 the information obtained. A Geographic Information System (GIS) will be a fundamental tool for
 441 organizing and displaying collected data. Additional elements that will be considered in developing
 442 the data management program include:

443

444

- 444 • Hardware requirements and availability as in-kind contributions (4)
- 445 • Software requirements (4)
- 446 • Staffing needs and availability as in-kind contributions (4)
- 447 • Techniques for providing remote access via Internet or other means (4)
- 448 • Quality Assurance/Quality Control
- 449 • Glossary (5)
- 450 • Coordination as appropriate with other data bases
- 451 • Consistency with Ecology requirements as noted in contract (2)

452

453

Implementation Strategy/Status

454 *A Data and Information Management Technical Team will be formed to develop a*
 455 *comprehensive strategy to deal with the considerable data that will be compiled, generated,*
 456 *and analyzed in the Watershed Management Project and similar efforts. It will likely be*
 457 *necessary that a designated data management staff person be assigned for this project.*
 458

459 2.6 Public Education/Involvement Program

460 One of the purposes of the Watershed Management Act is to provide local citizens with the
 461 opportunity for maximum possible input concerning their goals and objectives for water resource
 462 management and development. (1) In order to achieve this purpose it is necessary to provide a
 463 mechanism for citizens to understand the process, translate technical documents into layperson terms,
 464 help citizens to understand the complex technical and policy issues that will be addressed through the
 465 planning effort, and provide opportunities for meaningful and substantive input. One of those
 466 opportunities is through participation on the Planning Unit, but others are needed as well.

467
 468 In recognition of the critical importance of public involvement and education in the process, the
 469 Initiating Governments early in the process endorsed a conceptual plan for public involvement and
 470 education (8). The adopted goal of the plan was to:

- 471 • Provide numerous opportunities for constructive public participation in the Watershed
 472 Management Project;
- 473 • Assist and support the public involvement process under NEPA and SEPA;
- 474 • Build incremental understanding of issues and throughout each of the phases of the planning
 475 process and, through this understanding, foster widespread community understanding of the final
 476 watershed management plan.

477 Implementation Strategy/Status

478 *A technical team was formed during the summer of 1999 to help develop and implement*
 479 *actions related to public involvement and education. The team is developing a long-range*
 480 *plan to meet the goals noted above, however many education/information related actions have*
 481 *been needed in the interim. Some of the interim methods that have been and are being used to*
 482 *meet these goals include:*
 483

- 484 • *Establishing and maintaining a Website for the project*
- 485 • *Setting up a telephone hotline*
- 486 • *Providing support for caucus formation and function*
- 487 • *Providing facilitation for the Planning Unit and consistent interaction/communication*
 488 *with the caucuses*
- 489 • *Hiring a staff person to provide lead support to the Public Involvement and Education*
 490 *program*
- 491 • *Providing monthly public forums (these were placed on hold due to low attendance)*
- 492 • *Inviting the public to suggest participants for a 3-day Instream Flow Methods conference,*
 493 *attending the 3-day conference, and providing for public comment on the draft report.*
- 494 • *Developing a resource kit on instream flows for the media and general public, holding*
 495 *open houses*
- 496 • *Establishing a long-term education plan which includes a needs assessment of the major*
 497 *anticipated audiences (caucuses, general public, decision makers, etc), articulation of*
 498 *educational goals, the development and implementation of audience appropriate*
 499 *educational methods and products, and the use of evaluative tools to measure*
 500 *achievement of the stated educational goals. The long-range plan will also identify other*
 501 *elements of the scope of work where public input is needed, as well as opportunities for*
 502 *general public outreach*

503 504 2.7 Process Flow Control Protocol

505 The WRIA 1 watershed planning process, and the implementation of the action elements thereof, shall
 506 be executed in a specific sequence of steps that have been established in order to maximize the
 507 chances of the plan's success. The sequence embodies and employs the principles of adaptive
 508 management. The sequence shall apply to each plan section for each sub-basin and each plan
 509 component.

510 511 2.7.1 Planning Process Flow Control Protocol

512 The planning process shall consist of the execution of each task within each section in this Scope of
 513 Work, in a sequence to be determined by the decision making logic set forth below. The planning
 514 process applies to each plan component (water quantity, water quality, instream flow, and fish habitat)
 515 within each sub-basin.

516
517 From time to time the planning process will likely be carried on simultaneously within more than one
 518 section. The process flow control protocol shall apply independently to each activity within each
 519 section; provided, however, that prior to the completion of Section 4.2, Select Best Solutions, all tasks
 520 in all prior sections shall be completed.

521
522 The planning sequence shall follow the decision making logic below. It is also depicted in the WRIA
 523 1 Watershed Planning Process Flow Sequence diagram (Figure 2).

524
525 Update the status of the planning process and collect any relevant new information (upper left box in
 526 Figure 2). New information could arise from any or all of the following sources: changes in statutes,
 527 contracts, agreements, court cases, initiatives and referenda; new developments in related projects
 528 public input; new discoveries from relevant science and engineering fields, including new modeling
 529 and simulation methodologies.

530
531 If any tasks within the pending section remain incomplete, or need to be updated based upon new
 532 information, then the pending section shall be addressed. After completing a section, return to the
 533 update (upper left box in Figure 2) process. If it is determined that there is no need to address the
 534 pending section, then the same decision making process shall be undertaken for each subsequent
 535 section, until Section 5.0, Approval, is reached.

536
537 If approval (upper right triangle in Figure 2) is achieved, implementation can begin. If approval is not
 538 achieved, return to the update process (upper left box in Figure 2).

539 540 2.7.2 Management/Implementation Process Flow Control Protocol

541 Provisions for adaptive management within the implementation phase (upper right shaded box of
 542 Figure 2) are discussed below. Adaptive management provisions are also depicted in the WRIA 1
 543 Watershed Management Process Flow Sequence diagram (Figure 3).

544
545 During the implementation phase, for each project within each plan component, the implementing
 546 action shall be carried out, meanwhile data will be collected via established monitoring protocols to
 547 enable evaluation of the success of the project. The collected data will be analyzed by comparing
 548 actual results with expected results for the point in time at which the data are analyzed (middle
 549 diamond – "Objectives Achieved" – from Figure 3).

550
551 If the comparison is favorable, the project (and data collection) will continue without modification. If
 552 the project is failing to achieve its objectives, the question needs to be answered, is the project being
 553 done properly, that is, according to the specifications provided in the plan?

554
555 If the answer is no, then corrective action shall be taken by the implementing party(ies) to bring
 556 actions on the ground in line with project specifications. If the answer is yes, it implies that the project

557 specifications themselves, hence the plan element, has a flaw that shall be corrected by returning to the
558 planning process and amending the plan, based upon the results of the data analysis. The party(ies)
559 responsible for reviewing and amending the plan shall be specified by the plan prior to its completion.
560

561 2.7.3 Process Flow Protocols

562 The intent of these Process Flow Control Protocols and their accompanying diagrams is to portray
563 only general process flow. Specific, detailed process flow control protocols will be established, when
564 and if needed, for particular sections or sub-sections of the planning and/or implementation process.
565

566 2.7.4 Implementation Strategy/Status Files

567 In order to provide a clear and easily accessible record of the progress of each planning activity within
568 each section of this Scope of Work, project managers shall create and maintain files in a suitable and
569 uniform electronic format that describe the current implementation status of each such activity.
570

571 2.7.4.1 Content

572 The content of each such status file shall contain at least the following:

- 573 ▪ File title: general format: sub-basin xyz water quality planning status.
- 574 ▪ Project personnel: list manager, other staff, roles; provide hot links to data such as: by whom
575 employed; contact data.
- 576 ▪ Sub-basin Name, Number (as/if applicable).
- 577 ▪ Component: (water quantity, water quality, instream flow, fish habitat).
- 578 ▪ Sub-component: (as/if applicable ; example: water rights study).
- 579 ▪ Sub-sub-component: (as/if applicable ; example: paper rights investigation).
- 580 ▪ Current Status: For each SOW section, sub-section, sub-sub-section, as applicable, display section,
581 sub-section, sub-sub-section number(s) and title(s), pass number (i.e., number of times subject
582 activity has undertaken that Section, sub-section, sub-sub-section); title of activity; product(s)
583 file(s) title, type, hot links to locations (if applicable and appropriate) and contents summary.
584

585 2.7.4.2 File Types

586 There shall be two such file types: Current Files, as described in Section 2.7.4.1, and Archive Files,
587 which shall consist of the accumulation of previous Current Status Files, structured as a Last-in, First
588 Out stack.
589

590 2.7.4.3 Implementation Strategy/Status Files Procedure

- 591 ▪ Each project manager of each planning activity shall update each activity's Current File at least
592 each time one of the sections of this Scope of Work is completed for that activity, and may update
593 the file more often as warranted.
- 594 ▪ Each time a project manager updates a Current File, authorized personnel shall update the
595 associated Archive File.
- 596 ▪ In order to provide public access to the implementation status of each planning activity, both the
597 Current and Archive Files will be made accessible on the WRIA 1 Watershed Management Project
598 web site.
599

600 **3.0 Technical Assessment/Analysis of Water Quantity, Quality, Instream Flows, and** 601 **Fish Habitat (Phase 2)**

602 3.1 Problem Definition/Analysis

603 3.1.1 Purpose

604 The purpose of the technical assessment phase is to gather, analyze, and evaluate data to clearly
605 understand the nature, conditions, and extent of problems and/or desired outcomes for each project
606 component.
607
608

609 3.1.2 General Approach

610 The assessment results will be the foundation for knowledge-based decision-making that will be used
611 to develop the most effective solutions that meet the project goals and address the bulleted items in
612 Section 1.1. Data will be collected that are necessary to enable an assessment of current conditions
613 and an understanding of the causal factors underlying these conditions. The collected data and
614 analysis will enable direct action to manage those factors to achieve desired outcomes.
615

616 3.1.2.1 Data Validity and Reliability

617 Following the definition of “best available science” (3), in order to ensure that the results of the data
618 collection, analysis and modeling processes are of maximum utility to this planning process, for each
619 set of data collected, each analysis performed, and any modeling undertaken, parameters shall be
620 specified for measurement of validity and reliability. Validity measures include acceptable level of
621 probable error and expected percentage contribution to total result.
622

623 In order to ensure that the results of data collection, analysis and modeling are reliable (i.e., repeatable
624 over time), the types of data collected and the methodologies used for analysis and modeling shall be
625 functionally consistent and well documented.
626

627 3.1.3 Tools and Methods

628 The best available science, including state-of-the-art analytical methodologies, will be employed in the
629 WRIA 1 Watershed Management Project(3). Mathematical models and computer simulations will
630 likely play a key role in the assessment and evaluation of information.
631

632 3.1.4 Data Collection

633 3.1.4.1 Existing Data

634 Information gathering for each of the program components will be an iterative process starting with
635 the collection and assessment of what is already known through existing studies, programs, and input
636 from individuals and groups.
637

638 3.1.4.2 Field Research

639 As data gaps and new information needs are identified they will be collected, assessed, and evaluated.
640 Data gathering will extend over a number of years and will continue beyond the adoption of
641 the Watershed Management Plan.
642

643 3.1.4.3 Routine Monitoring

644 Long-term routine monitoring and analysis will be needed to evaluate project success and ensure that
645 goals are met (4).
646

647 3.1.4.4 Catalog of Project Actions

648 All watershed projects, including those underway prior to the adoption of the WRIA 1 Watershed
649 Management Plan, will be cataloged and incorporated into the WRIA 1 watershed management
650 database.
651

652 3.1.4.5 Water Quantity

653 At a minimum the following information and analyses will be collected and evaluated for water
654 quantity:
655

- 656 • Estimate the amount of surface and groundwater present (1);
- 657 • Estimate the amount of surface and groundwater actually being used in the WRIA (1);
- 658 • Conduct a depletion analysis to accurately estimate the spatial and temporal uses of water in the
659 WRIA throughout the year (2,3);

- 660 • Estimate the amount of water represented by claims in the water rights claims registry, water use
- 661 permits, certificated rights, existing minimum instream flow rules, federally reserved rights, and
- 662 any other rights to water (1); Use the best available science to make reliable estimates of the
- 663 Lummi Nation water rights for both instream and out-of-stream uses (2,3);
- 664 • Identify the most senior instream and out-of-stream water rights in the WRIA and the next most
- 665 senior rights in turn based on the priority date of existing water right holders (3);
- 666 • Estimate future water needs (1);
- 667 • Estimate the amount of surface and ground water available taking into consideration seasonal and
- 668 other variations (1,2,3);
- 669 • Estimate the amount of surface and ground water available [to junior users and (3)] for further
- 670 appropriation taking into account [seasonal and other variations (1,2,3)] and the minimum
- 671 instream flows adopted by rule or to be adopted by rule under the RCW for streams in the
- 672 management area including the data necessary to evaluate necessary flows for fish (1,2,3);
- 673 • Estimate the total amount of water available in an undepleted condition (3);
- 674 • Identify location of areas where aquifers are known to recharge surface bodies of water and areas
- 675 known to provide for the recharge of aquifers from the surface (1);
- 676 • Contract with USGS to collect streamflow data throughout the watershed for the multi-year [10
- 677 year (3)] effort (2);
- 678 • Measure and/or estimate climate data (precipitation, evapotranspiration) at representative
- 679 locations in the WRIA (2,3);
- 680 • Evaluate existing land use/land cover data for its suitability in making water resource related
- 681 decisions (2,3).

682 Implementation Strategy/Status

683 *The following actions have been taken to date to implement part of the initial data needs*

684 *assessment for the water quantity component:*

- 686 • *The United States Geological Survey was hired to conduct a “Phase I Data Assessment”*
- 687 *in the summer of 1999. Their draft report was delivered on January 31, 2000. Among*
- 688 *other information, the report provides information on evapotranspiration, precipitation,*
- 689 *hydrogeologic information, streamflow discharge measurements, soil survey reports/data,*
- 690 *current and historical land use and cover, facilities with NPDES permits, irrigation water*
- 691 *use, current and historical water use,, and a sub-basin delineation..*
- 692 • *An evaluation of existing state water rights, claims, applications, certificates, and permits*
- 693 *has been initiated under the supervision of the Public Utility District. Two full-time staff*
- 694 *have been hired to assist. As noted in Section 3.3, sub-basin delineations are being*
- 695 *critically evaluated and defined as part of that process.*
- 696 • *Streamflow measurements are being collected under an interagency agreement between*
- 697 *the BIA, USGS, the Lummi Nation, and the Nooksack Tribe. Staff support from the*
- 698 *Initiating Governments is also being provided for the actual data collection.*
- 699 • *Aerial and bathymetric studies of Lake Whatcom are being completed through an*
- 700 *agreement with the Bureau of Reclamation.*

701

702 *Using the above information, a Water Quantity Technical Team should be formed and*

703 *charged with developing a detailed work plan to meet the component goal and address the*

704 *informational needs specified previously. The strategy should include an initial compilation*

705 *and assessment of existing data (much of which has been done). The Team should start with*

706 *the approach detailed in the previous draft scope of work and the comments/concerns*

707 *submitted by the Non-municipal Water System Caucus (including definitions/interpretations*

708 *of key terms, and specific recommendations, interpretations, questions, etc.).*

709 3.1.4.6 Water Quality

710

711 Water quality will be assessed in two sections, surface and ground water (5), where appropriate.
 712 Information collected and analyzed must include:

713

- 714 • Legally established/designated characteristic uses of each of the nonmarine water bodies in the
 715 management area (1);
- 716 • An examination based on existing studies of the degree to which legally established water quality
 717 standards are being met (1);
- 718 • An examination based on existing studies of the causes of water quality exceedences, including an
 719 examination of information regarding pollutants, point and nonpoint sources of pollution, and
 720 pollution-carrying capacities of water bodies in the management area. The analysis should take
 721 into account seasonal stream flow or level variations, natural events, and pollution from natural
 722 sources that occurs independent of human activities (1);
- 723 • An examination of any total maximum daily load established for nonmarine bodies of water in the
 724 management area, unless a total maximum daily load process has begun in the management area
 725 as of the date the watershed planning process is initiated under RCW.82.060 (1);
- 726 • Conduct the necessary data collection and analysis to estimate TMDLs for fecal coliform (in
 727 progress), temperature, [BOD (3)], sediment, and other water quality attributes of concern in order
 728 to ensure water quality standards are being achieved (2); and
- 729 • An examination of existing data related to the impact of fresh water on marine water quality (1).

730

731 Implementation Strategy/Status

732 *Using the above information a Water Quality Technical Team should be formed and charged*
 733 *with developing a detailed work plan to meet the component goal and address the*
 734 *informational needs specified previously. The strategy should include an initial compilation*
 735 *and assessment of existing data. The Team should start with the approach detailed in the*
 736 *previous draft scope of work and the comments/concerns submitted by the Non-municipal*
 737 *Water System Caucus (including definitions/interpretations of key terms, and specific*
 738 *recommendations, interpretations, questions, etc.).*

739

740

741 3.1.4.7 Instream Flows

742 Instream flows were established for WRIA 1 by the Department of Ecology in 1986. Over the years
 743 many questions have been raised as to whether the methods used to establish those flows adequately
 744 do so – particularly in light of advances in science over subsequent years. The Watershed
 745 Management Act provides an opportunity for modifications to established instream flows if agreed to
 746 by the parties specified in the act.

747

748 The Initiating Governments agreed that instream flow needs will be examined as part of the WRIA 1
 749 Watershed Management Project. The MOA further states that an analysis will be conducted to
 750 estimate optimal instream flows for fisheries resources in the WRIA throughout the year (3).
 751 Consistent with the agreement to base decisions on best available science, the purpose of the analysis
 752 is to evaluate the method used to establish current instream flows relative to advances in methodology.

753

754 Implementation Strategy/Status

755 *The analysis is currently evaluating the various approaches to estimating streamflow levels*
 756 *needed to optimize fish habitat quality and quantity. The recommended ‘state-of-the-art’*
 757 *method(s) will be used during 2000-2001 in order to provide the information needed to*
 758 *develop a watershed management plan by June 30, 2002. In order to modify existing flows, a*
 759 *unanimous vote by parties specified in the Act will be required – if a unanimous vote is not*
 760 *achieved, flows will not be modified as part of this process (1).*

761

762 *A 3-day Instream Flow Methods conference was held in September 1999. The purpose of the*
763 *conference was to evaluate the different methods available for estimating the relationship*
764 *between streamflow and fish, and to help determine the best methods to use to reevaluate*
765 *existing instream flows. A draft report was written by the conference chairperson (Dr.*
766 *Thomas Hardy) and has been presented to the public and Planning Unit for review.*

767
768 *A Technical Team will be established to develop a recommendation for how to proceed with*
769 *respect to instream flows.*

770

771 3.1.4.8 Fish Habitat

772 Coordinate with salmon recovery efforts to 1) develop information that summarizes current and
773 historic fish habitat and populations 2) evaluates physical, biological, and chemical processes in terms
774 of good habitat, and 3) evaluates factors limiting current finfish and shellfish populations throughout
775 WRIA 1.

776

777 Implementation Strategy/Status

778 *Initial efforts occurred in 1999 to develop a strategy to ensure coordination and linkage*
779 *between WRIA 1 Watershed Management Project and salmon recovery as well as other*
780 *related programs. These efforts were placed on hold for several months for a number of*
781 *reasons including pending revisions to the initial draft scope of work and the Whatcom Creek*
782 *fire. Recently, a group has been meeting to discuss how to best coordinate salmon recovery*
783 *with the Watershed Management Project. A coordination strategy is being developed.*
784 *Quarterly updates on this coordination effort will be provided to the Planning Unit with*
785 *additional updates as needed.*

786

787 3.2 Assessment

788 For each plan component within each sub-basin, an assessment of conditions and extent of problems
789 shall be undertaken once sufficient data have been collected to enable such assessment. The end
790 product of the assessment phase is the identification of the specific locations where corrective actions
791 are needed, and the type and extent of the problems that need such corrective action.

792

793 3.2.1 Establish Criteria for Evaluation of Success

794 For each component and within each sub-basin, specific measurable objectives shall be established.
795 The purpose of the objectives is to define the measure of whether the plan goals have been achieved.
796 If the achievement of any objectives does not result in the achievement of associated goals, new
797 objectives will be defined through the adaptive management process.

798

799 3.2.2 Define Monitoring Protocols

800 Protocols shall be established during the assessment phase to provide specific guidance for collecting
801 information that shall be used to monitor and evaluate the effectiveness of corrective actions.

802

803 **4.0 Develop/Revise Watershed Management Plan**

804

805 4.1 Develop and Evaluate Solutions/Alternatives

806 As with the assessment phase of the project, the identification and evaluation of solutions will be an
807 incremental/iterative process building upon recommendations from previous planning efforts and
808 considering existing laws, programs, and other efforts. Information obtained under Section 2.4 –
809 Linkage and Coordination, will be used to help identify existing/previous efforts. Solutions shall not
810 be added that obligate a particular government unless that government has at least one representative
811 on the Planning Unit and the respective members appointed to represent the obligated government
812 agree to adding the element that creates the obligation (1).

813
814 At a minimum the following alternatives/solutions will be considered:

815
816 Water Quantity:

817 Increasing water availability through strategies that include but are not limited to:
818 conservation, water reclamation and reuse, voluntary water transfers, additional water
819 allocations, and additional water storage and water storage enhancements including aquifer
820 recharge and recovery (1).

821
822 Water Quality:

823 Developing a recommended approach for implementing the TMDL established for achieving
824 compliance with water quality standards unless a TMDL process has begun in the WRIA as of
825 the date the watershed planning process is initiated under RCW 90.82.060 (1). In addition,
826 explore options to manage groundwater quality.

827
828 Instream Flow:

829 Aside from establishing or modifying existing instream flows, no specific strategies are
830 specified in the Act for meeting the goal of ensuring that water is available in sufficient
831 quantities to satisfy the minimum instream flows for fish. This is an area where there is
832 tremendous opportunity for creative solutions.

833
834 Fish Habitat:

835 Coordinate and integrate analysis and assessment with other salmon recovery and
836 management efforts.

837
838 Information collected in Section 2.4 – Linkage/Coordination will be used to assist in identifying
839 alternatives. Criteria developed in Section 2.2 – Criteria for Evaluating Proposed Solutions will be
840 used to help identify recommended solutions.

841
842 Implementation Strategy/Status

843 *Because solutions are dependent on obtaining a better understanding of the problems through*
844 *the assessment phase, it is recommended that immediate actions related to solutions will be*
845 *limited to compiling suggestions and recommendations from recent planning and management*
846 *efforts. On a regular basis the Initiating Governments should review overall progress and*
847 *determine when to initiate further action for solution identification. This does not preclude*
848 *the need to move forward with early action activities.*

850
851 **4.2 Select Best Solutions**

852 For each component within each sub-basin, using the criteria developed in Section 2.2, the various
853 solutions developed in 4.1 shall be sorted and those solutions with the most promise shall be selected
854 for incorporation into the Watershed Management Plan.

855
856 **4.3 Assemble Plan**

857 The Watershed Planning Act requires that a watershed management plan be written, however, it does
 858 not prescribe the exact contents or form of the plan (4). The outline below will be followed for
 859 general format, although it may be modified as the project progresses. The outline follows the one
 860 recommended in the Guidance Manual with some modifications.

861

862 Cover letter-recommending plan to various legislative authorities and others as needed

863

Executive Summary

864

Introduction and Background

865

- Goals/objectives of the WRIA1 Watershed Management Project

866

- Scope

867

- Key issues addressed

868

- Relationship to other programs and planning

869

- Conformance with SEPA/NEPA

870

Planning Process

871

- Initiating Governments

872

- Planning Unit participants

873

- Public involvement process and documentation of SEPA/NEPA integration

874

- Problem and issue definition

875

- Method of decision-making

876

Technical Assessment and Findings

877

- Historical context

878

- Existing data

879

- New studies performed

880

- Summary of key findings

881

- Overview of technical validation process

882

- Reference to complete studies or reports in appendices or elsewhere

883

Alternatives Analysis

884

- Water Quantity

885

- Description of alternatives

886

- Criteria applied

887

- Recommended alternatives (ordinances, rules, technical assistance, education, funding, formal agreements, etc.)

888

- Environmental Impact Analysis (SEPA/NEPA linkage)

889

- Water Quality

890

- Description of alternatives

891

- Criteria applied

892

- Recommended alternatives (ordinances, rules, technical assistance, education, funding, formal agreements, etc.)

893

- Environmental Impact Analysis (SEPA/NEPA linkage)

894

- Instream Flows

895

- Description of alternatives

896

- Criteria applied

897

- Recommended alternatives (ordinances, rules, technical assistance, education, funding, formal agreements, etc.)

898

- Environmental Impact Analysis (SEPA/NEPA linkage)

899

- Fish Habitat

900

- Description of alternatives

901

- Criteria applied

902

- Recommended alternatives (ordinances, rules, technical assistance, education, funding, formal agreements, etc.)

903

- Environmental Impact Analysis (SEPA/NEPA linkage)

904

- Description of alternatives

905

- Criteria applied

906

- Recommended alternatives (ordinances, rules, technical assistance, education, funding, formal agreements, etc.)

- Environmental Impact Analysis (SEPA/NEPA linkage)

Recommended Implementation Strategy

- For each recommendation include who will implement action and why, integration with related programs/processes, funding and other resources needs including sources of funds, methods to implement and ensure compliance, and schedule;
- Long-term data collection;
- Long-term organized institutional structure to ensure implementation, review progress, take corrective action, involve public, report to entities, and respond to new needs or information;
- Contingencies and process for cases where an organization designated for implementing a plan recommendation is unable or unwilling to do so; and
- Monitoring and other measures to evaluate success.

Conclusion

- Recommendation of plan to legislative bodies and others as appropriate.

Appendices

- MOAs or other agreements
- Criteria used to evaluate alternative action plans
- Dissenting opinions if applicable
- Coordination Plan
- Technical documentation
- Long-term data collection and management program
- Implementation structure and responsibilities
- Glossary of key terms (5)
- Public processes required for SEPA/NEPA and other items as needed
- Public written comments (including application to SEPA/NEPA)

Implementation Strategy/Status
To be determined.

5.0 Approval

In order for a watershed plan to draw on the authority granted by the Watershed Management Act, at a minimum it must be approved by county legislative authorities, using a specific process described in the Act.

Implementation Strategy/Status
The approval process should be reviewed to ensure that it is clear to all parties. When and how this will be done will need to be determined.

6.0 Implementation of the Watershed Management Plan

One of the most important elements that will be considered is the implementation strategy for plan recommendations. Issues related to actual implementation should be considered as the recommendations are being developed. The implementation strategy should consider the following.

- Who the party(ies) is(are) that will carry out each element of the management plan, and the responsible individuals in each case where the party is a corporate entity;
- Why each party was selected to perform that plan element;
- Integration with related programs and processes;

- 957 • Funding and other resource needs including whether funding is available and/or how the funding
- 958 will be provided for each element of the plan;
- 959 • What methods will be employed by each party to ensure their compliance with the requirements
- 960 of the plan element(s) for which they are responsible;
- 961 • What special relationships, rule changes, agreements, contracts, or other arrangements, if any,
- 962 shall be established by or among the various parties involved in implementing the
- 963 recommendation;
- 964 • Schedule for implementation recognizing actions that are time sensitive;
- 965 • Long-term data collection;
- 966 • Long-term organized institutional structure to ensure implementation, review progress, take
- 967 corrective action, involve public, report to entities, and respond to new needs or information;
- 968 • Contingencies and process for cases where an organization designated for implementing a plan
- 969 recommendation is unable or unwilling to do so; and
- 970 • Monitoring and other measures to evaluate success (1).

971
972 Implementation Strategy/Status

973 *A Technical Team will be formed to help guide development of the implementation strategy.*

974 **7.0 Early Action Projects and Activities**

975 The Watershed Management Act encourages the Planning Unit to identify projects and activities that
976 are likely to serve both short-term and long-term management goals and that warrant immediate
977 financial assistance from the state, federal, or local government. If there are multiple projects, the
978 Planning Unit shall give consideration to ranking projects that have the greatest benefit and schedule
979 those projects that should be implemented first (1).

980
981 Steps and Criteria:

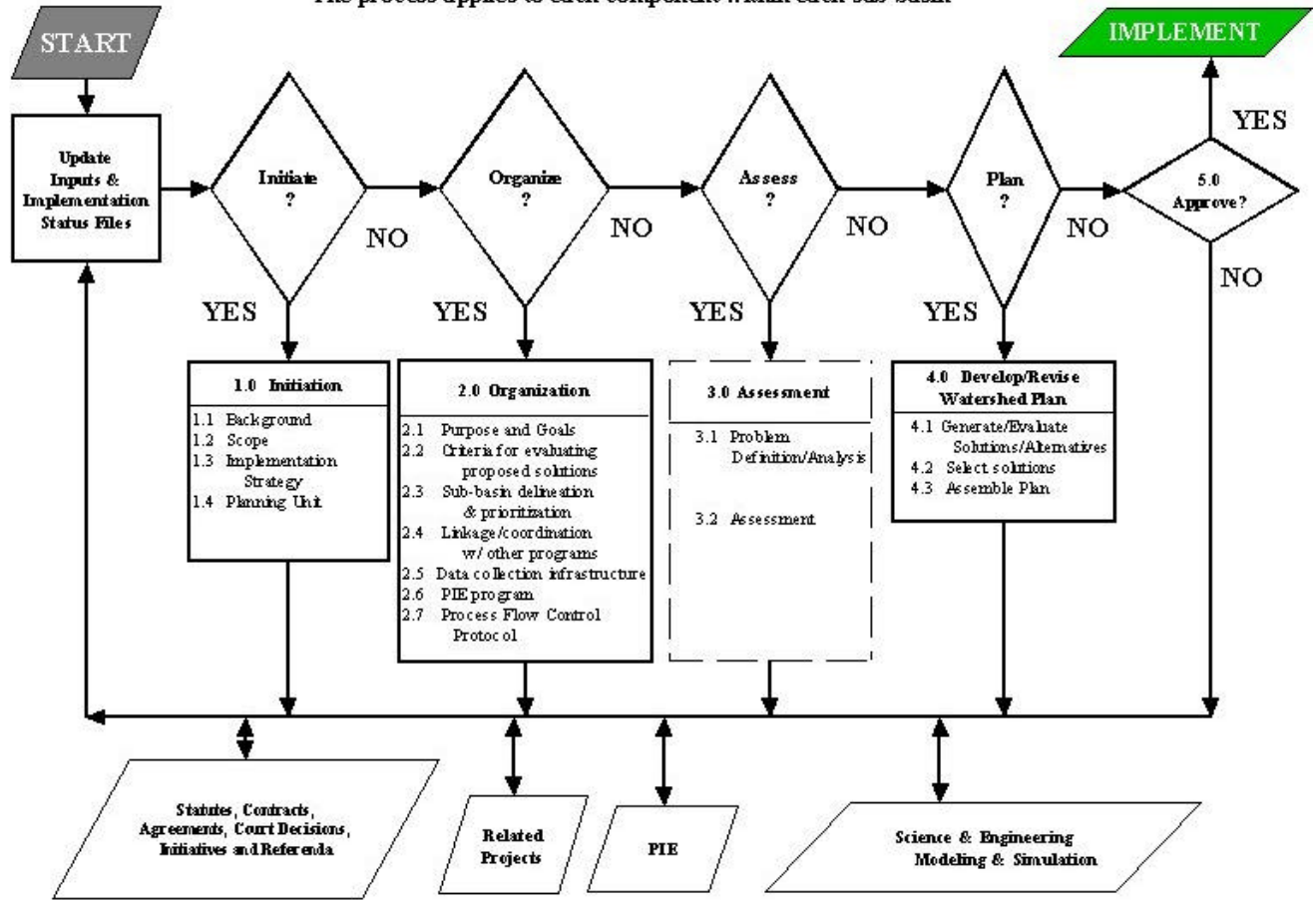
- 982 • Determine scope of problem: location(s), affected parties, impacts;
- 983 • Determine what, if anything, is being done to address the problem already, who is doing it, and
- 984 evaluate effectiveness;
- 985 • If there are multiple projects, rank projects that have the greatest benefit and schedule those
- 986 projects first;
- 987 • If existing action is working, Planning Unit simply issues recommendation of support;
- 988 • If existing process isn't working, or nothing is being done, explore means to get it done;
- 989 • Evaluate alternatives based upon criteria in Section 2.2 above;
- 990 • Chart location(s), details of actions taken, and;
- 991 • Monitor results.

992
993 Implementation Strategy/Status

994 *To be determined.*

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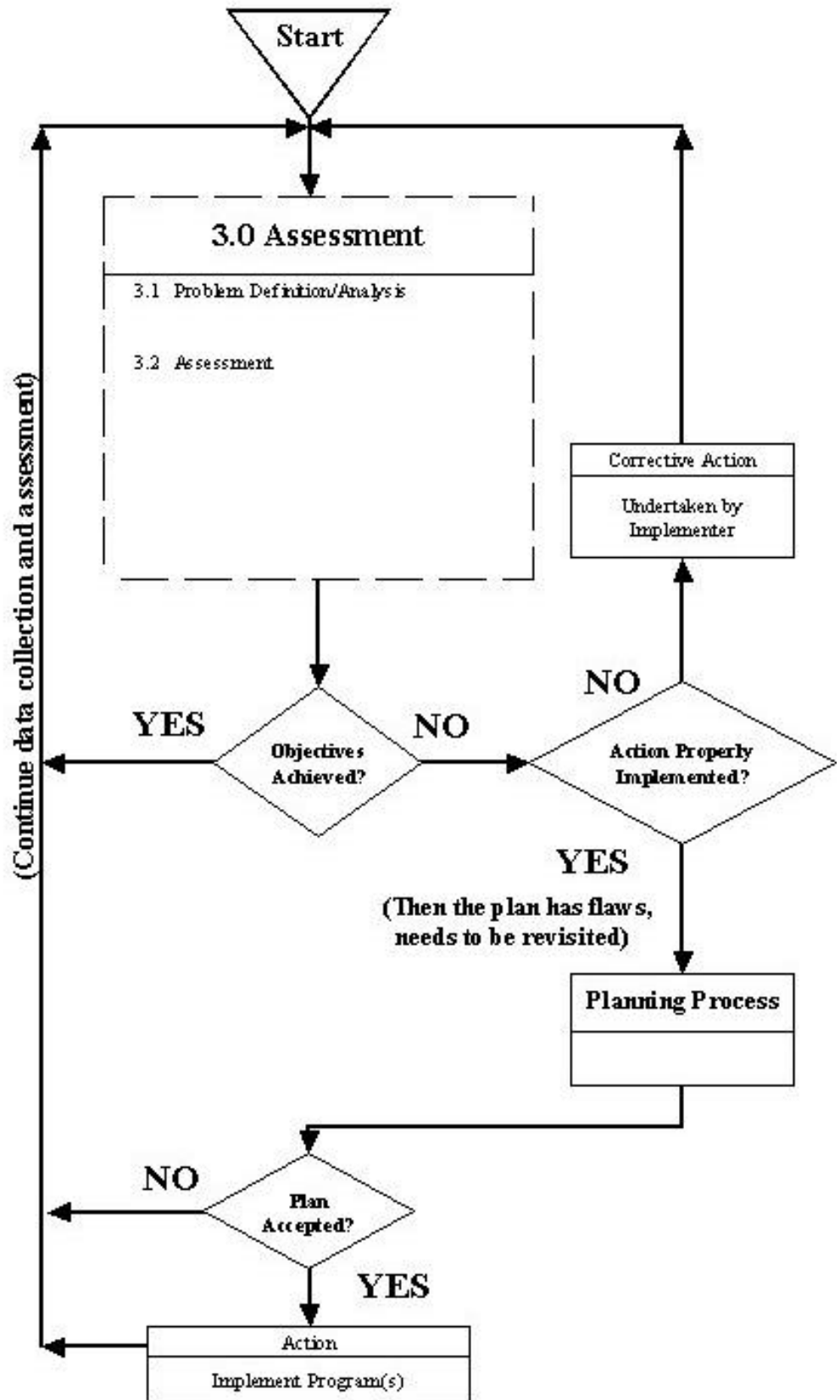
Figure 2: WRIA 1 Watershed Planning Process Flow Sequence V 1.0
 The process applies to each component within each sub-basin



Note: processes with dashed borders are shared between planning and management

Figure 3: WRIA 1 Watershed Management Process Flow Sequence V 1.0

The process applies to each component within each sub-basin



DRAFT SUBJECT TO LEGAL REVIEW

Draft Instream Flow Action Plan, draft Version 6c.

Executive Summary

The purpose of this Instream Flow Selection and Adoption Action Plan (ISF Action Plan) is to take actions that result in recommendations for instream flows that support other processes where such flows are established. These actions will include:

- On a drainage scale:
 - providing pertinent information to affected parties and providing opportunities for them to ask questions, identify their needs, and discuss management options for water resource management; and
 - facilitating negotiations to recommend (to both participants of the WRIA 1 Watershed Management Project [WRIA 1 Project] and other processes) a range of flows (including regulatory flows) that support ecological functions of WRIA 1 stream systems.
- On a regional scale, provide recommended flows to:
 - the water quantity, water quality, and fish habitat elements of the WRIA 1 Project;
 - the Federal/Tribal/State claim settlement process (to be accepted or rejected and, if rejected, to return to this process); and
 - the State regulatory process including rule making by Ecology on flow setting.

The ultimate goal is to have water of sufficient quantity and quality to meet the needs of current and future human generations, including the restoration of salmon, steelhead, and trout populations to healthy and harvestable levels and the improvement of habitats on which we collectively rely (SOW March 2000).

The heart of this ISF Action Plan is the drainage scale effort to inform and involve affected parties. This education and involvement effort is followed by a local negotiation process intended to provide instream flow recommendations to the WRIA 1 Project participants and other processes. This effort will be led by the Intergovernmental Instream Flow Working Group. The goal is to negotiate and recommend the range of flows needed to support the ecological functions and the out of stream needs of the various drainages that comprise WRIA 1. The local tribal governments, Lummi Nation and Nooksack Indian Tribe, and Washington State have indicated their interest and willingness to participate in this negotiation process, have agreed to support this effort, and are willing to accept or reject the recommended flows in a Federal/Tribal/State settlement process (pending confirmation from tribal and state policy makers). The Intergovernmental Instream Flow Working Group is working to get agreement from the federal government that it will support this effort and that it too is willing to accept or reject the flow recommendations in a Federal/Tribal/State settlement process.

Tribal water claims have a significant impact on local water management. If a senior federal or tribal water right is left unresolved or is not quantified, the result is uncertainty about the future availability of water for every other water use in WRIA 1. Therefore, it is very important that the WRIA 1 process leads to a resolution of these questions. In order to provide the needed certainty this ISF Action Plan supports a process that resolves tribal water claims. The local tribes, Lummi

DRAFT SUBJECT TO LEGAL REVIEW

47 Nation and Nooksack Indian Tribe, have various claims with the Federal government including
48 claims for water rights. The Federal government has a defined process for settling tribal claims.
49 The ISF Action Plan is intended to support the local portion of this settlement process by providing
50 flow recommendations that will be accepted or rejected by the Federal/Tribal/State settlement
51 process and, if rejected, returned to the local process for further work.
52

53 Because the current instream flows set by Ecology's existing rule in 1986 are expected to require
54 modification, this ISF Action Plan will provide a recommended management strategy including
55 regulatory flows for a new Ecology rule making to set prospective flows for the purpose of
56 processing pending applications for new water rights.
57

58 A level of clarity and certainty regarding existing water rights and claims is needed in order to
59 achieve the goals of the WRIA 1 Project to fairly and effectively manage the WRIA 1 water
60 resources. The required level of clarity and certainty regarding who has what water rights does not
61 currently exist in WRIA 1. Existing state statutes, as interpreted by case law, make adjudication in
62 state Superior Court the only process currently available to determine the extent and validity of
63 water rights and claims. However, state Superior Court may not be the most appropriate or efficient
64 venue to achieve a negotiated settlement of federal, tribal, and state water rights and claims.
65 Consequently, since it is anticipated that adjudication may eventually be required to achieve the
66 required level of clarity and certainty regarding water rights, a task envisioned by this ISF Action
67 Plan is that as part of the initial education effort, the Intergovernmental Instream Flow Working
68 Group will garner support for state and federal legislation to reform the adjudication process or
69 provide an alternative process that is more user friendly and effective. The state Attorney General's
70 office is currently working on a reform recommendation. Whatever the outcome of the reform
71 effort, the timing and handling of the needed local adjudication will be worked out in the drainage
72 scale negotiations as part of the initial outreach and information sharing effort. A further effort
73 envisioned by this ISF Action Plan, that may require legislative change, is to create a way for
74 currently unpermitted water users to participate in a meaningful way in the goals of this Action Plan
75 and ultimate adjudication. Under the current law unpermitted water users do not have standing in an
76 adjudication.
77

78 It is understood that this ISF Action Plan is part of the WRIA 1 Project and is intended to integrate
79 with the other components of the WRIA 1 Project (i.e., water quality, water quantity, instream flow,
80 and fish habitat). To that end, flow recommendations, flow management strategies, technical work,
81 and the adoption process for flow recommendations will support the other components of the WRIA
82 1 Project and, upon conclusion of this ISF Action Plan, they will be incorporated into the WRIA 1
83 Project management process.
84

85 Approvals of the work products of this ISF Action Plan start at the drainage level and continue with
86 the Joint Board and Planning Unit. Ultimately, the approval process is expected to include federal,
87 tribal, and state legislative actions and/or court decrees in order to make the results of the process
88 binding on all water users and provide the needed certainty which will serve as the foundation for
89 future water resource management decisions in WRIA 1.
90

91 A substantial commitment of time and money and the political will to carry it through to a viable
92 conclusion is required to achieve the desired results of this ISF Action Plan.

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93
94 This proposed ISF Action Plan is undergoing policy and legal review by the Joint Board, State, and
95 Small City representatives. This proposed Action Plan is being distributed for comments and
96 further definition of the roles and responsibilities of the Project participants.
97

98 The following document provides more details and context for this proposed ISF Action Plan.
99

100
101 **I. Introduction**
102

103 In response to Chapter 90.82 RCW, the Water Resources Inventory Area No. 1 (WRIA 1)
104 Watershed Management Project was initiated in 1998 by the City of Bellingham, Whatcom County,
105 PUD No. 1 of Whatcom County, the Lummi Nation, and the Nooksack Indian Tribe. Substantial
106 steps have been taken to engage the general population in the watershed planning and
107 implementation project. The active participants in the Project are: a Planning Unit, comprised of 18
108 water interests and governmental caucuses; an inter-governmental Staff Team; six technical teams;
109 and a Joint Board. More descriptive information about the WRIA 1 Watershed Management
110 Project can be found at the Project’s website (<http://www.wria1project.wsu.edu>).
111

112 The overall goal of the WRIA 1 Watershed Management Project is to have water of sufficient
113 quantity and quality to meet the needs of current and future human generations, including the
114 restoration of salmon, steelhead, and trout populations to healthy and harvestable levels and the
115 improvement of habitats on which we collectively rely (March 2000 SOW). Water quantity, water
116 quality, instream flows, fish habitat and the interrelationship of these elements are being addressed
117 as part of the project. This ISF Action Plan is focused on the instream flow element of the WRIA 1
118 Project – specifically, the Action Plan will be used to select, achieve, adopt, and recommend
119 instream flow levels throughout WRIA 1 for enforcement through other processes. This Action
120 Plan builds on the technical work being conducted as part of the WRIA 1 Project and a May 2002
121 symposium on potential methods to recommend and adopt instream flows.
122

123 The parties recognize that final agreement is more likely if the parties can freely discuss alternatives
124 and hypotheticals without prejudice to positions they may take in legal proceedings. Therefore, no
125 discussion, proposal, plan, agreement, (other than a formally adopted plan or agreement) offer of
126 compromise, proposed agreement, concession, statement, material, or documents whether oral,
127 written, or in electronic or other format (herein the “protected material”), made or prepared by the
128 parties or their authorized agents in furtherance of the planning process envisioned by this
129 agreement shall be offered into evidence against the party providing the “protected material” in any
130 legal or administrative proceeding. Protected material originating from the Lummi Nation shall not
131 be offered into evidence in any legal or administrative proceeding, regardless of whether the Lummi
132 Nation is a party to that proceeding. Reports and data from the original studies conducted by or on
133 behalf of the Planning Unit are public information.
134

135 In Washington statutes RCW 90.22.020 and RCW 90.54.020(3)(a), the term “instream flow” is
136 defined as the minimum amount of water flowing through a natural stream course that will, with
137 reasonable confidence, protect and preserve instream resources at healthy and sustaining levels.
138 Statutorily protected instream resources include fish (in all life stages), wildlife, aesthetics,

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139 recreation, water quality, navigation, and other environmental values. Environmental values may
140 include recruitment of fresh water to the estuaries, riparian vegetation, floodplain wetlands, and
141 maintenance of channel geomorphology. It is noted that hydropower and waste assimilation are not
142 listed as an instream resource in either Chapters 90.22 or 90.54 RCW of state law. Federal Clean
143 Water Act (CWA)(40 CFR 131.10) prohibits the state from adopting "waste assimilation" as a
144 designated use. State law also requires that the instream flows provide adequate waters for non-
145 feedlot related riparian stockwatering that does not result in extraordinary waste of water (RCW
146 90.22.040). Water requirements sufficient to maintain all of these instream values at an acceptable
147 level are the "instream flow requirements." (RCW 90.22, 90.54.020(3)(a), USFWS 1993).

148
149 The current instream flow requirements for WRIA 1 are specified in Chapter 173.501 WAC. In
150 establishing instream flow rules, the Washington State Department of Ecology (Ecology) is required
151 by RCW 90.03.247 to consult with the Washington State Department of Agriculture and Office of
152 Community Development, as well as Federally recognized Indian Tribes and Nations. The WRIA 1
153 rule established in 1986 can be found online at www.ecy.wa.gov/lawsrules/ecywac.html#wr.

154
155 An intergovernmental working group was tasked with developing a draft action plan that
156 recommends an approach for selecting, achieving, adopting and enforcing instream flow levels
157 throughout WRIA 1. This draft Action Plan is being submitted to the Planning Unit, Staff Team,
158 technical teams, and Joint Board for review, comment, completion, and ultimate approval and
159 implementation. The current draft of the ISF Action Plan will be used as a guideline to implement
160 Instream Flow Pilot Negotiations within WRIA 1. The information learned in the Pilot Negotiation
161 process will be used to modify the ISF Action Plan over time. As will become apparent, due to the
162 interrelationship of water quantity, water quality, instream flow, and fish habitat, implementation of
163 this Action Plan is dependent on the technical studies underway in all of the WRIA 1 Project
164 elements.

165
166 The working group that prepared this draft Action Plan were: Clare Fogelsong (City of
167 Bellingham), Bruce Roll and John Thompson (Whatcom County), Tom Anderson and Rebecca
168 Schlotterback (PUD No.1), Leroy Deardorff and Jeremy Freimund (Lummi Nation), Bob Kelly and
169 Llyn Doremus (Nooksack Indian Tribe), Tom Laurie and Jim Bucknell (Ecology), and Bill Verwolf
170 (Small Cities). The working group meetings were facilitated and summarized by Mary Dumas and
171 Rob Kelly (Resolution Services).

172
173 Including this introduction, this Action Plan is comprised of eight sections and two appendices. The
174 Action Plan sections are:

- 175
- 176 ➤ Section I introduction
 - 177 ➤ Section II lists the criteria used to evaluate the potential success of various approaches to
178 selecting and adopting instream flow levels.
 - 179 ➤ Section III presents an overview of the recommended process and participants.
 - 180 ➤ Section IV presents the Recommended Instream Flow *Selection* Action Plan
 - 181 ➤ Section V presents the Recommended Instream Flow *Achievement* Action Plan
 - 182 ➤ Section VI presents the Recommended Instream Flow *Adoption* Action Plan.
 - 183 ➤ Section VII presents the Recommended Instream Flow *Enforcement* Action Plan
 - 184 ➤ Section VIII presents the Instream Flow *Implementation and Funding* Action Plan

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The two appendices to this Action Plan are:

- Appendix I - Definition of Terms
- Appendix II - Federal Reserved Water Rights- The Negotiated Settlement Option (IIFWG, Nov 5, 2003)

A list of definitions used in the development of this Instream Flow Action Plan has been included in Appendix I to function as a reference in reviewing this document. It also reflects a common understanding among the authors of the terms used. Various terms describing stream flow are used throughout this Plan. The distinctions and relationships between these stream flow terms are described below. The full definitions of italicized terms are in Appendix I.

Ecological flow regimes for each stream will be developed using best available science. Ecological flow regimes are made up of five functional flow components: valley maintenance, riparian maintenance, channel maintenance, fisheries baseflow, and water quality maintenance flow. The ecological flow regime is the technical product of the work currently being conducted by Utah State University (USU) and the WRIA 1 technical teams.

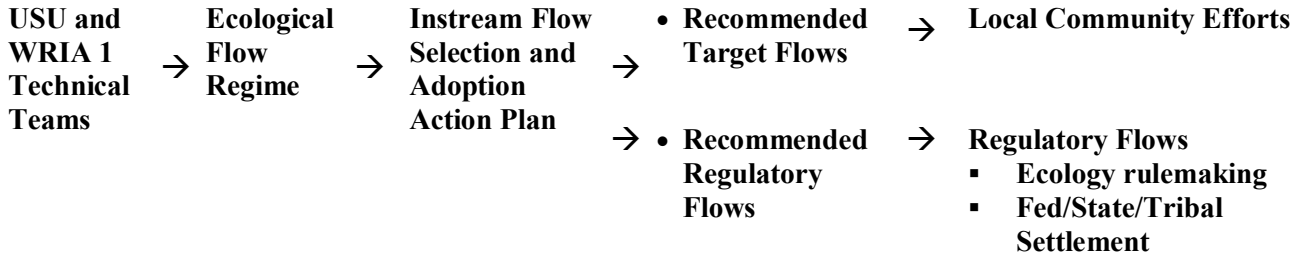
Target flows are achievable and include consideration of instream and out of stream needs. Target flows will be developed locally by the Intergovernmental Instream Flow Working Group (IIFWG –see section “Participant Description and Summary of Roles”) for *each* of the ecological flow components. Target flows will be the recommended goals that will come out of local negotiations and are the flows the community agrees to try to achieve. It is noted that the target flow may or may not be the same as the recommended regulatory flow regime.

Regulatory flows will be developed locally by the Intergovernmental Instream Flow Working Group (IIFWG –see section “Participant Description and Summary of Roles”) for *each* of the ecological flow components. WRIA 1 approved regulatory flows based on an agreed-to management strategy will be the recommended regulatory flow regime. The recommended regulatory flows will be submitted to: (a) Ecology for the use in the state rulemaking process to revise the current *state regulatory instream flows* for WRIA 1 Chapter 173-501WAC, and (b) the Federal/Tribal/State settlement process and may be used by a judge and/or legislative body for consideration and adoption through a consent decree and/or Federal and State legislation. The result of these two adoption processes will establish the final regulatory flows.

State and/or Federal regulatory instream flows may be different than locally recommended flows if the WRIA 1 Planning Unit and/or the Joint Board fail to reach agreement on recommended flows and do not pass on a recommendation to Ecology and the Federal/Tribal/State settlement process. Ecology or the settlement process may then undertake rule making or court or legislative action to change existing state regulatory flows. Figure 1 provides a summary of the overall selection and adoption process and how each of these flow terms are used.

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230 Figure 1.
231



232
233

234 **II. Criteria for Success**

235
236 The working group concluded that to be successful, the action plan for *selecting* the flows to
237 recommend and adopt must meet agreed upon criteria. The working group agreed that the approach
238 to selecting target instream flows to recommend must:

- 239
- 240 ▪ Conform to the Federal and State guidelines, statutory requirements, and other legal
- 241 requirements for instream flows (as described in the Introduction)
- 242 ▪ Be compatible with the goals of the WRIA 1 Project and achieve the goals of the ISF Action
- 243 Plan
- 244 ▪ Be an approach that all parties are willing to accept
- 245 ▪ Be based on the best available science and a credible, scientific analysis of WRIA 1
- 246 instream and out-of-stream water users’ proportionate impacts on flows, water quality, and
- 247 salmonid life cycle and habitat use at a specific river or tributary reach
- 248 ▪ Include target flows that are sufficient to achieve specific healthy and sustainable fish
- 249 populations at all life stages and meet Endangered Species Act (ESA) obligations, but also
- 250 reflect the limitations posed by seasonal/annual variability in hydrologic and climate
- 251 conditions. That is, target flows provide conditions conducive to viability of specific fish
- 252 species and life stages in a variety of hydrologic conditions (e.g., the inter-annual variation
- 253 in water availability resulting from annual variations in precipitation)
- 254 ▪ Meet all water needs to the greatest degree possible, including reconciling the effects of
- 255 meeting instream fish flow targets with legal, existing, and projected out-of stream uses and
- 256 needs.
- 257 ▪ Allow for maintaining a viable economy in WRIA 1 to the maximum extent practicable
- 258 ▪ Recommend target flows that are physically and financially achievable to the maximum
- 259 extent practicable consistent within legal requirements.

260
261 Similarly, the working group concluded that to be successful, the action plan for *adopting* instream
262 flows must meet the following criteria:

- 263
- 264 ▪ Provide reasonable certainty for both instream and out of stream users that water will be
- 265 there for future operations and other related factors. (This will require keeping adequate
- 266 records of use and maintaining water right records in a manner to facilitate enforcement of
- 267 water law. The use of adjudication for existing water rights will be applied as negotiated.).

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- 268 ▪ Defines a clear process of what is going to happen and who is involved.
- 269 ▪ Contributes to salmon recovery and also meets the requirements of the Endangered Species
- 270 Act (ESA).
- 271 ▪ Meets any applicable requirements of the Federal Clean Water Act (CWA).
- 272 ▪ Includes consideration of competing uses. (Note: By definition, recommended target flows
- 273 include consideration of out of stream uses.)
- 274 ▪ Be acceptable to all parties.
- 275 ▪ Have adaptability and flexibility to account for issues beyond local control such as climate,
- 276 new information/ideas, changed factual circumstances, and important legal developments.
- 277 ▪ Recognize existing statutory and legal obligations (e.g., public health and safety and treaties
- 278 between the United States and Indian Tribes).
- 279

280 The working group acknowledges that providing for finality and certainty may limit the extent that

281 adaptive management can be incorporated as an approach for achieving adequate flows for all uses.

282

283

III. Process Overview and Participants

284

285

286 The overall process involves four sub processes (instream flow selection, achievement, adoption,

287 and recommendation to other processes that achieve enforcement) that are sequenced, but also

288 overlapping in time, as summarized in Figure 2. Two processes that occur outside the WRIA 1

289 Watershed Management Project, 1) the Federal/Tribal/State settlement process, and 2) rule making

290 by Ecology, are included in this ISF Action Plan for completeness and clarity.

291

292 To better define and test this ISF Action Plan, the Plan will be implemented in phases. The first

293 phase will be pilot project implementation of this Plan, which will start during 2004. This ISF

294 Action Plan may be revised in the future based on the results of these negotiations and any proposed

295 changes will be brought to the Joint Board and Planning Unit for approval.

296

297 The working group agrees that all affected parties need to be given ample opportunity to express

298 their views and must have opportunities to be represented in the processes to select, achieve, adopt,

299 and recommend instream flows. Further they must understand how flows will be enforced. To

300 accomplish this overall goal, the “concentric circle” approach described by Michael Mirande and

301 included in the *Instream Flow Selection Methodology Symposium Proceedings* (WRIA 1, May

302 2002) will be applied – particularly to the *selection* of target and regulatory flows for

303 recommendation. The “concentric circle” approach is designed to give everyone that needs to be

304 involved an opportunity to participate, as depicted in Figure 3. This decision making approach

305 works with each interested and affected party in succession. Discussions may repeat or iterate back

306 through the succession as changes are made or new information is obtained. There will be

307 significant effort put into information sharing and involvement of affected parties. For example, the

308 Intergovernmental Instream Flow Working Group (IIFWG defined below) will develop a set of

309 initial ecological flows for a particular drainage or logical aggregation of drainages. Then the

310 IIFWG will organize a series of workshops with the affected parties in each drainage or logical

311 aggregation of drainages to discuss flow recommendations. The participating affected parties and

312 the IIFWG will work together to determine the ability of each drainage or aggregation to meet the

313 flows, identify problems and solutions, and to determine an appropriate management strategy.

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Figure 2. The general sequencing/overlapping of the four subprocesses

<i>Selection</i>	<i>Achievement</i>	<i>Adoption</i>	<i>Enforcement</i>
<i>Steps Inside the WRIA Project 2514 Process and Implementation</i>			
<i>Decide where to start and how big an area. Decide whether to support request for Federal involvement at beginning of process or delay involvement. Decide timing of adjudication request and stay.</i>			
<i>Initial target flows developed</i>	<i>Initial target flow discussions and contracts with affected parties by drainage</i>		<i>Water user education</i>
<i>Initial target flows converted to target flows through interaction with affected parties</i>			<i>Water user education</i>
<i>Target flows recommended to PU for approval</i>	<i>Flow achievement discussions with affected parties</i>	<i>PU considers and conducts public workshop on recommended target flows Need to check RCW 90.82 to make sure the PU has authority to conduct hearings. It may be the lead entity?</i>	<i>Water user education</i>
	<i>Target flow contracts negotiated and signed</i>		<i>Water user education</i>
	<i>Develop management strategies</i>	<i>WRIA 1 Watershed Management Plan v2 includes flows recommended for Ecology rule making and Federal settlement process</i>	<i>Begin compliance and enforcement on users without valid state water rights target flow contracts</i>
<i>Steps Outside the WRIA Project 2514 Process and Implementation</i>			
<i>Request Federal Involvement. Initiate formal negotiations between State, Federal and Tribal governments</i>	<i>Contracts, consensual agreements leading to formal settlement agreement</i>	<i>Ecology rule making to adopt recommended instream flows with priority date that affect new users. Continue a negotiated settlement option with Lummi Nation and Nooksack Tribe to end with a consent decree.</i>	<i>Proceed with adjudication.</i>

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Figure 3. Step 2 Initial Flow Selection Representation & Step 3 Seek Agreement on Flow Recommendations Diagram

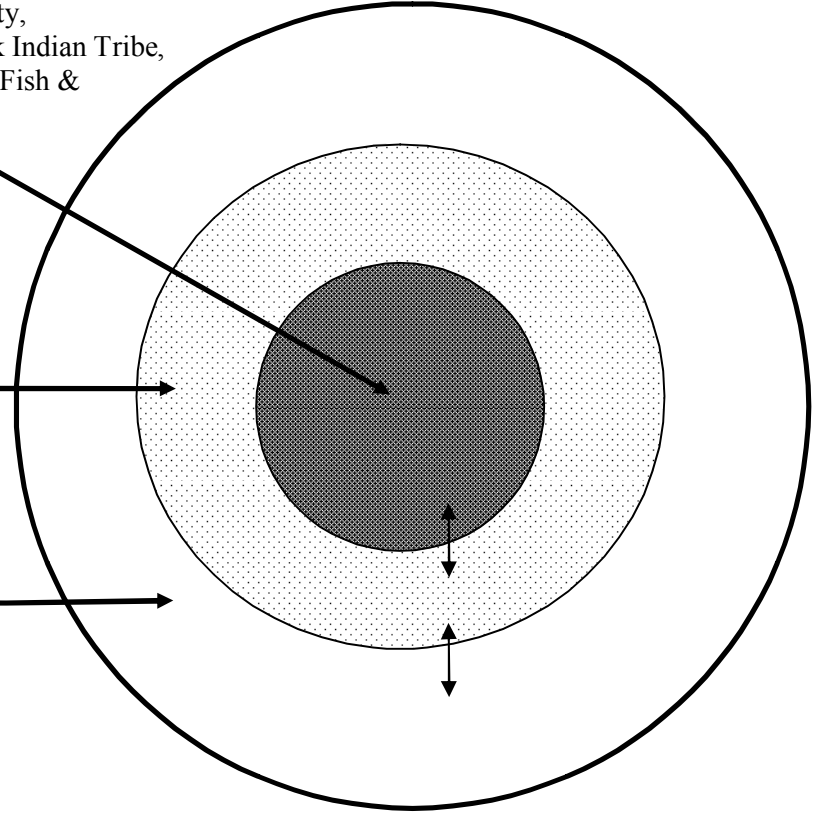
Intergovernmental Working Group

(City of Bellingham, Whatcom County, PUD No.1, Lummi Nation, Nooksack Indian Tribe, Ecology, Washington Department of Fish & Wildlife, NOAA , USFS, and EPA)

Planning Unit

(Governmental and water interest caucus representatives)

WRIA-wide Affected Parties



During Joint Board and Planning Unit meetings, these efforts will be reviewed. Any changes proposed by the Joint Board and Planning Unit will be taken back for discussion with the affected parties in the drainages.

When all of the drainages have recommended target and regulatory flow regimes, those recommendations will be evaluated by the IIFWG for any conflicts and inconsistencies and a set of WRIA-wide recommended target and regulatory flows will be presented to the Joint Board and Planning Unit. The Joint Board, IIFWG, and the Planning Unit will conduct a public workshop. Then the Joint Board and Planning Unit will make decisions on approving the WRIA-wide target and regulatory flows and, based on a management strategy, recommend target and regulatory flows to the Federal/Tribal/State settlement process and to Ecology for state regulatory instream flow rule making. Formal adoption of flows will occur through the Joint Board and Planning Unit, State rulemaking, negotiated settlement, Federal and/or State legislation, and a federal court consent decree, or a combination of the above.

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362 **Participant Descriptions and Summary of Roles**

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Joint Board. The Joint Board is comprised of the administrative decision makers of the WRIA 1 “Initiating Governments”. The Initiating Governments are the Lummi Nation, the Nooksack Indian Tribe, Whatcom County, City of Bellingham, and the Whatcom County Public Utility District No.1.

Intergovernmental Instream Flow Working Group (IIFWG) – The IIFWG is a subset of the WRIA 1 Watershed Management Project participants. Members are: City of Bellingham, Whatcom County, PUD No. 1 of Whatcom County, the Lummi Nation, Nooksack Indian Tribe, a representative for the Small Cities Caucus, and the Department of Ecology. The Washington Department of Fish and Wildlife, NOAA Fisheries, U.S. Fish and Wildlife Service, U.S. Forest Service, and the Environmental Protection Agency will also be asked to review the flow recommendations and will be asked to participate in the IIFWG. The IIFWG will propose WRIA 1-wide instream flow goals (to be approved by the Joint Board and Planning Unit), develop initial flow recommendations, recommend flows to the Joint Board and Planning Unit for approval, and participate in the Federal/Tribal/State settlement process. Ecology also conducts formal state regulatory instream flow rule making.

Planning Unit - The WRIA 1 Planning Unit as currently constituted will continue as described in the Implementation Plan. Planning Unit members will approve WRIA-wide instream flow goals, can participate in drainage level workshops on recommended flows where their constituents have interests, will review and approve flows recommended by IIFWG, and approve WRIA 1 Watershed Management Plans which include implementation and management option strategies.

Affected Parties - In each drainage, affected parties are the property owners, water right document holders (certificate, permit, application, claim), and the Planning Unit Caucuses. Affected parties are encouraged to participate in the preparation of the flow recommendations and identification of strategies for achievement. They can also participate in information sharing workshops on, this Plan, water laws, and management options and participate in Ecology’s formal state regulatory flow rule making process, adjudicatory court action, and/or legislation.

Federal Negotiating Team – A Federal Negotiating Team is required for the Federal/Tribal/ State settlement process. The Intergovernmental Working Group, the Joint Board, and the Planning Unit will consider supporting expanding the geographic scope of the existing Federal Negotiating Team assigned to the Lummi Reservation water rights negotiations. The Department of Interior will be requested to add representatives from the U.S. Fish and Wildlife Services, NOAA Fisheries, the Environmental Protection Agency, and the U.S. Forest Service to the existing Team that has representatives from the Bureau of Indian Affairs, the Bureau of Reclamation, and the Solicitor’s Office. There is more information in Appendix II.

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407 Other Participants – In establishing instream flow rules, Ecology is required by RCW
 408 90.03.247 to consult with the Washington State Department of Agriculture and Office of
 409 Community Development. In addition, because of the interrelationship of watersheds
 410 and the overlap of usual and accustomed fishing areas, Ecology will consult with all
 411 affected Indian tribes whose usual and accustomed grounds and stations include WRIA
 412 1. Parties that are not otherwise legally bound to the process would also participate.
 413
 414

IV. Recommended Instream Flow Selection Action Plan

415
 416
 417 The proposed approach to identifying the instream flow requirements (as defined in Appendix I)
 418 begins with an effort to inform and involve affected parties while seeking agreement between the
 419 Intergovernmental Instream Flow Working Group (IIFWG) members on initial flow
 420 recommendations. The rationale for using the IIFWG to make the initial recommendations for
 421 target flows is the following:

- 422 ▪ To reduce expenses and effort, a collaborative approach will be used to reach agreement.
 423 For practical reasons, cost and efficiency, the number of members of this group are limited.
- 424 ▪ Representative governments have the ability to direct technical and legal resources to ensure
 425 that recommended flows meet the criteria described previously.
- 426 ▪ Agreement among the IIFWG members is critical as they are all in a position to veto an
 427 outcome they cannot accept.

428
 429 The following four-step approach to selecting instream flows is proposed: 1) foundation
 430 development, 2) initial flow recommendation development, 3) seek acceptance of affected parties,
 431 4) recommend flows to the Joint Board and Planning Unit that at least include target and regulatory
 432 flows. Pursuant to the selection criteria, there must be possible physical and financial means for
 433 achieving the recommended target flows. Possible strategies will be explored to ensure
 434 achievement is possible but final approaches used to achieve flows may be left up to the
 435 implementing entities.
 436

437 **Step 1 Foundation Development:** The IIFWG will recommend to the Joint Board and Planning
 438 Unit for approval where geographically to start and how big of drainage units (one drainage or
 439 several aggregated drainages) to include in this ISF Action Plan process. This process will
 440 ultimately be completed throughout WRIA 1. Multiple teams may be established to work in
 441 different areas of WRIA 1 depending on available funding.
 442

443 The IIFWG will propose WRIA-wide instream flow goals (to be approved by the Joint board and
 444 Planning Unit). Then the IIFWG will compile technical information for the first drainage unit and
 445 conduct workshops for affected parties in the drainage unit to ensure that all of the affected parties
 446 within the drainage unit are identified and informed about the issues listed below. It is anticipated
 447 that this will involve the following affected parties:

- 448 ▪ Water right document holders (certificate, permit, application, claim)
- 449 ▪ Water users
- 450 ▪ Property owners
- 451 ▪ Planning Unit Caucuses

452

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453 This foundation development step will require a significant public involvement and information
454 exchange effort on the following topics:

- 455 ▪ WRIA-wide instream flow goals and overview of flow selection, achievement, adoption,
456 and enforcement process
- 457 ▪ Ecological flow regime
- 458 ▪ Other instream uses
- 459 ▪ Current and future out-of-stream uses
- 460 ▪ Hydrologic impacts of drainage activities
- 461 ▪ Water quality
- 462 ▪ Hydraulic continuity
- 463 ▪ Groundwater availability
- 464 ○ ASR potential
- 465 ▪ Surface water storage potential
- 466 ▪ Wetlands restoration, protection, and mitigation banking
- 467 ▪ Concept of initial target flows and target flows
- 468 ▪ Concept of flow contracts
- 469 ▪ Endangered Species Act
- 470 ▪ Clean Water Act
- 471 ▪ Potential processes to resolve extent of existing rights and claims, including adjudication
- 472 ▪ Federal involvement, settlement agreements, and consent decrees
- 473 ▪ Tribal claims
- 474 ▪ Enforcement options
- 475 ▪ Conservation
- 476 ▪ Reclamation and Reuse
- 477 ▪ Washington State Water Law

478
479 This effort is focused on ensuring that the information needed to make knowledge-based decisions
480 is available to all parties for consideration in the flow selection process. The information from the
481 technical analysis will provide the foundation for discussions at the drainage level. It is expected to
482 include modeled hydrographs for the drainage unit under historical, current, and future use patterns
483 for wet, average, and dry circumstances; estimated current and future out of stream needs; current
484 water claims, applications, permits and certificates; the range of ecological flows desired and a
485 description of the WRIA-wide instream flow situation.

486
487 As the discussion in the drainage unit expands it will include current and future out of stream water
488 needs. This gets tied to a discussion of existing rights and claims. A level of clarity and certainty
489 regarding existing water rights and claims is needed. The required level of clarity and certainty
490 regarding who has what water rights does not currently exist in many drainage units. Existing state
491 statutes, as interpreted by case law, make adjudication in state Superior Court the only process
492 currently available to determine the extent and validity of water rights and claims. The existing
493 adjudication process allows for a range of geographic scales, from multiple WRIsAs to a drainage
494 level. However, the use of state Superior Court and the existing adjudication process may not be
495 the most appropriate or efficient venue to achieve a negotiated settlement of existing state water
496 rights and claims. It is anticipated that either local or basin wide adjudication will eventually be
497 required to achieve the required level of clarity and certainty regarding existing water rights and
498 claims. The IIFWG will develop recommendations for policy makers regarding state and federal

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499 legislation to reform the adjudication process or provide an alternative process that is more user
500 friendly and effective. The state Attorney General's office has developed reform recommendations;
501 new legislation may be introduced in 2004. What ever the outcome of the reform effort the timing
502 and handling of the needed local adjudication will be worked out in the drainage scale negotiations.
503

504 Federal reserved water claims including Tribal water claims have a significant impact on local
505 water management. If a senior federal or tribal water right is left unresolved, or is not quantified,
506 the result is uncertainty about the future availability of water for every other water use. Therefore,
507 it is very important that the WRIA 1 process leads to a resolution of these questions. The local
508 tribes in Whatcom County have stated a desire to quantify their claims. The local tribes have
509 various claims with the Federal government including claims for water rights. The Federal
510 government has a defined process for settling tribal claims. The local tribes preferred method is a
511 Federal/Tribal/State settlement process as outlined in Appendix II. The local tribes and the State
512 have agreed that within a Federal/Tribal/State settlement process they would accept or reject the
513 flow recommendation from this process and if they are rejected refer them back to this process for
514 further work (pending policy and legal review). The ISF Action Plan is intended to support the local
515 portion of this settlement process by providing flow recommendations. The IIFWG will, as part of
516 the discussions in the drainage unit, hold discussions about the pros and cons of a
517 Federal/Tribal/State settlement process. The IIFWG will solicit public input to determine the level
518 of support for recommending this approach and recommendations will be forwarded to the Joint
519 Board and Planning Unit for action.
520

521 A further effort envisioned by this ISF Action Plan, that may require legislative change, is to create
522 a way for immediate improvements to flows and habitat to occur and for currently unpermitted
523 water users to participate in a meaningful way in the goals of this Action Plan and ultimate
524 regulatory processes. This is discussed in more detail in Section V.
525

526 **Step 2 Initial Flow Recommendation Development:** The IIFWG will develop the initial flow
527 recommendations for the drainage unit. This development step is to identify flow levels that state,
528 federal, tribal, and local government representatives will accept. Physically and financially
529 practicable strategies to achieve flows will be identified. This is to ensure that the recommended
530 flows are achievable within the context of the selection criteria identified previously. Several
531 approaches may be used by the IIFWG to arrive at the recommended flows, and the recommended
532 flows will be evaluated in terms of the criteria described previously. The initial flow
533 recommendation development will generally proceed as follows:
534

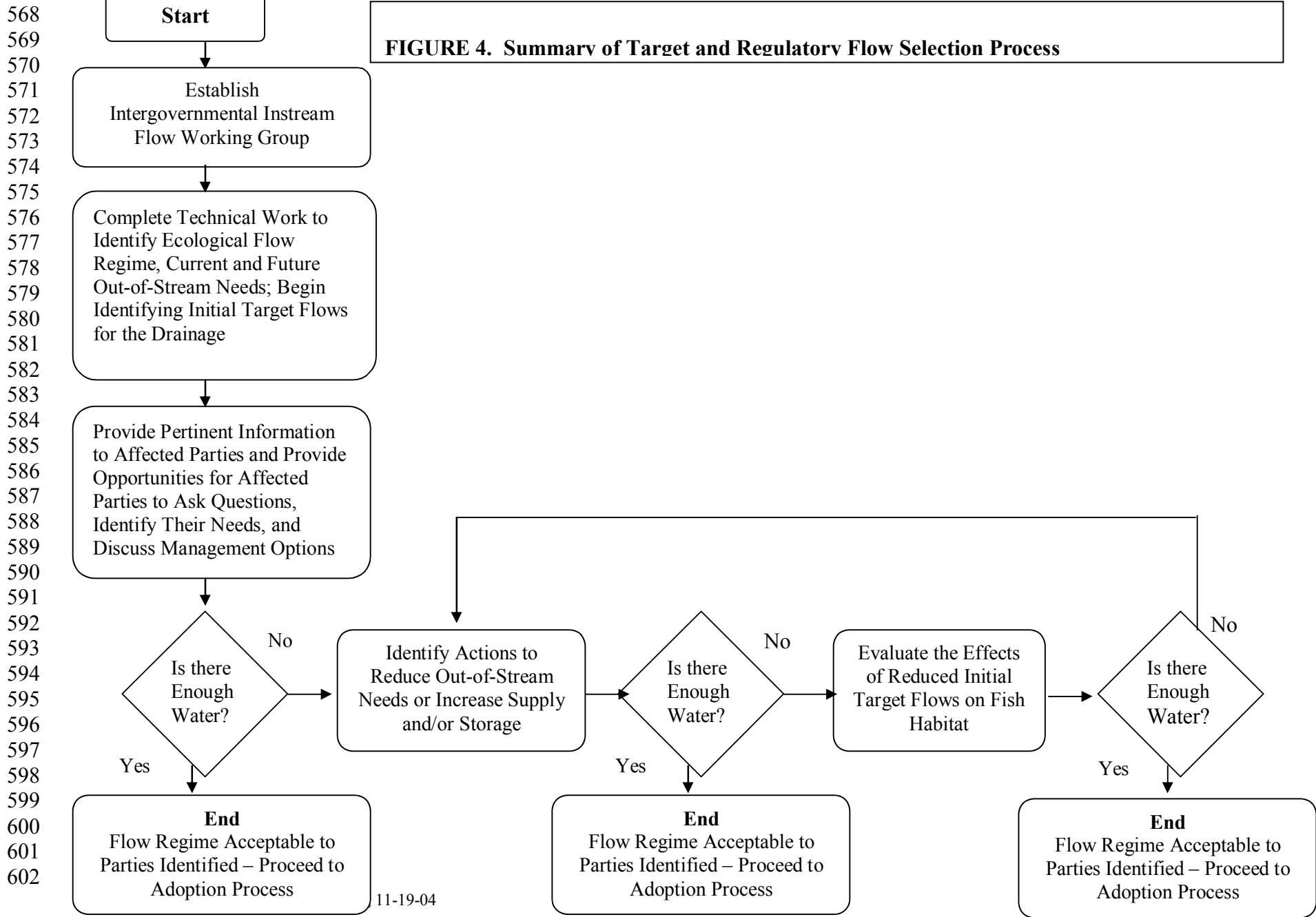
535 A. Utah State University's technical studies will be used to identify the instream flow requirements
536 of an ecological flow regime for the drainage unit. The Utah State University's modeling effort
537 will provide hydrographs for historic, current, and future scenarios under wet, average, and dry
538 conditions. Those studies will also define a quantitative relationship between instream flow and
539 fish habitat quantity and quality for the drainage unit.
540

541 B. An estimate of current and future uses in the drainage unit will be prepared along with an
542 analysis of existing water right claims, permits, certificates, and applications. This will include
543 uses of water from wells exempt from permitting under RCW 90.44.050.
544

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- 545 C. The surface water model predictions of a historic conditions instream flow hydrograph for each
546 drainage unit will be developed for wet, average, and dry years to evaluate water availability
547 during each of these weather conditions. An analysis will be conducted to compare this
548 “natural” water availability to the estimated current and future needs as well as the existing
549 claims permits and certificates. This analysis will determine the magnitude, duration, timing,
550 and frequency of events where water is available for instream and out-of-stream uses. This
551 analysis may include evaluating sequential wet and/or dry years. Also modeling of historic
552 flows will provide information on human impact to flows. Land use changes by humans can
553 have significant effects on the timing and size of flow events. Understanding how changes have
554 affected flows and habitat availability will provide direction on how to achieve desired
555 outcomes.
556
- 557 D. The results of the WRIA 1 ground water quantity modeling effort will be used to assist in the
558 assessment of the impact of ground water use upon stream flow and habitat, and has the
559 potential to be used to evaluate augmentation of streamflow and habitat, and evaluate other
560 ground to surface water and habitat options that might be useful in development of instream
561 flow recommendations.
562
- 563 E. When the IIFWG reaches consensus on proposed flows and practicable management strategies,
564 then initial flows for recommendation have been identified for a drainage unit and the process
565 can move to step 3.
566
- 567 The IIFWG will use the process summarized in Figure 4 in both Step 2 and Step 3.

FIGURE 4. Summary of Target and Regulatory Flow Selection Process



11-19-04

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603 **Step 3. Seek Agreement on Flow Recommendations:** Once the IIFWG has agreed to an initial
604 flow recommendation, it will present its initial flow recommendation, selection methodology, and
605 justification to the affected parties for feedback and discussion at a workshop in the drainage.
606 These flow recommendations will include information on the full range of ecological flows and will
607 specifically include target flows, regulatory flows to be set by Ecology, and regulatory fish flows
608 for the Federal/Tribal/State settlement process. For drainage units where the analysis indicate there
609 is not sufficient water to meet instream and out-of-stream needs, the IIFWG and the participating
610 affected parties will first analyze the economic and other impacts of decreased water supply for out
611 of stream uses and then look for alternatives to increase supply such as conservation, water
612 reclamation and reuse, surface or ground water storage, and importation of water. The cost impacts
613 of these alternatives will be analyzed. If this analysis determines that both out-of-stream and
614 instream uses can be met in a manner consistent with the selection criteria identified above, the flow
615 regime is ready for adoption. If not, the effects of lower than recommended instream flows on fish
616 habitat quantity and quality will be analyzed and the potential alternatives for enhancing instream
617 flow or habitat will be identified including storage and ground water augmentation. The economics
618 of all options will be evaluated and will include the consideration of environmental factors. This
619 process, which will be iterated until acceptable flows and possible strategies are identified, is
620 summarized in Figure 4.

621
622 In some drainage units the required level of clarity and certainty regarding who has what water
623 rights does not currently exist. This makes the task of balancing available water with uses and
624 rights impossible. Existing state statutes, as interpreted by case law, make adjudication in state
625 Superior Court the only process currently available to determine the extent and validity of water
626 rights and claims. As part of the process of iterating the instream and out of stream needs the
627 IIFWG and the participating affected parties will analyze the available methods (including
628 adjudication both local and basin wide) for determining the size and extent of existing rights and
629 claims and will agree on what process will be applied to the drainage unit in question.

630
631 Further as part of the iteration process the IIFWG and the participating affected parties will discuss
632 management strategies for all aspects of water management including flow achievement,
633 compliance with environmental laws, flow contracts, and the long term enforcement options. The
634 IIFWG and participating affected parties will prepare a recommendation on management strategies
635 to be forwarded to the Joint Board and Planning Unit to be incorporated into the WRIA 1
636 implementation process.

637
638 Once agreement is reached, the next step is for the recommended flows for the drainage unit to be
639 forwarded to the Joint Board and Planning Unit for approval. It is anticipated that in some cases the
640 process for reaching agreement with the Joint Board and/or Planning Unit will include iterations on
641 the flow recommendations with the IIFWG and participating affected parties.

642
643 **Step 4. Recommend Flows:** Due to the interrelationships and cumulative nature of stream flow
644 within a system of drainages, initial flow recommendations will first be developed for each
645 drainage. After that the flows for each drainage within a system will be identified and integrated,
646 then the combined flow recommendations for the system will be recommended to the Joint Board
647 and Planning Unit. After all WRIA 1 flow recommendations have been developed and approved by
648 the Joint Board and Planning Unit, the IIFWG will review the compiled set of flows WRIA-wide

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649 for any inconsistencies and contradictions. The IIFWG will then present a final complete set of flow
650 recommendations to the Joint Board and Planning Unit for approval. A public hearing will be held
651 on the recommended full set of flows. Then the Joint Board and Planning Unit will consider the
652 comments from the public hearing and make a decision on the recommended flows. This set of
653 approved flow recommendations will then be incorporated into the next version of the WRIA 1
654 Watershed Management Plan. If the agreed to management strategy requires Ecology to change
655 current regulatory flows, the Planning Unit will provide direction to Ecology to proceed with
656 rulemaking.

657
658 These instream flow recommendations would also be forwarded to the Federal/Tribal/State
659 settlement negotiations for acceptance or rejection. If the flow recommendations are rejected, the
660 process would iterate until acceptable flow recommendations are achieved or an impasse is declared
661 in which case the process could default to an adjudicative court process.

662
663 If the IIFWG, Joint Board, and Planning Unit cannot agree on the recommended flows, two
664 scenarios are possible:

- 665 ▪ Evaluate the possibility of reaching agreement and if agreement looks likely, go back to
666 discussion and make changes to flows or out of stream demands until agreement is reached.
- 667
668 ▪ Notify Ecology that agreement on recommended flows cannot be reached. Ecology could
669 then go to rule making on its own. Alternatively, if an adjudication has been started the
670 adjudicating court could be notified that an agreement could not be reached and that a
671 judicial determination is requested.

672
673 If the Joint Board and Planning Unit decision is to request no change to current state regulatory
674 flows in Chapter 173-501 WAC, then the instream flow recommendation process under Watershed
675 Planning would end. The existing adopted flows would then be used in other WRIA 1 Project work
676 as needed.

677
678 Potentially affected parties who chose to not participate in the initial flow review process will have
679 an opportunity to participate in the formal Ecology rule making, adjudication court case when
680 started, and flow adoption stage that follows. It is anticipated that in some cases private parties or
681 some water resource interest groups may not be able to accept a given flow recommendation. It
682 should be noted that these flow recommendations will be subject to further public and judicial
683 review in the adoption process.

684 685 686 **V. Recommended Instream Flow *Achievement* Action Plan**

687
688 Because a regulatory flow adoption process may require agreements that take significant time due
689 to associated legal processes, it is recommended that flow achievement strategies be developed and
690 implemented early on that are not dependent on the regulatory flow adoption process. One possible
691 approach that has been proposed is the concept of consensual agreements that result in habitat
692 improvement in the short term and participation of unpermitted water users in the negotiation
693 process. These consensual agreements, which may include other provisions, are being referred to as
694 flow contracts.

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695
 696 Affected parties in the drainage will also have the opportunity to discuss additional strategies for
 697 achieving target flows in their drainage. The WRIA 1 implementation process will provide
 698 assistance as needed or if there are no willing implementers the WRIA 1 Management group (as
 699 defined in the Implementation Strategy) will take on the task.
 700

701 In addition, the flow achievement process will evaluate strategies such as:

- 702 ▪ Monitoring the percentage of available habitat supported by the recommended target flows
- 703 ▪ Dedicating a use maximum and reserving the rest for fish in certain reaches (upside down
- 704 water rights)
- 705 ▪ Trading habitat and wetland enhancements for out-of-stream uses
- 706 ▪ Stream augmentation by ground water or seasonal surface water storage
- 707 ▪ Changing surface water withdrawals to ground water sources
- 708 ▪ Drainage modifications
- 709 ▪ Irrigation scheduling, especially of direct surface water withdrawals
- 710 ▪ Conservation and reuse
- 711 ▪ Land use and zoning changes
- 712 ▪ Other management options such as interbasin transfers and water marketing

713

714

715 **VI. Recommended Instream Flow *Adoption Plan***

716

717 Following recommendation on the drainage unit level and integration of flows for all drainages in
 718 the stream systems, the Joint Board and Planning Unit will approve the flow recommendations. To
 719 the extent necessary the boards, commissions and councils of the local governments will have an
 720 opportunity to approve flows that affect their jurisdiction. As part of the WRIA 1 Plan approval the
 721 lead agency will hold public hearings prior to adoption by the County Council of the recommended
 722 flows.
 723

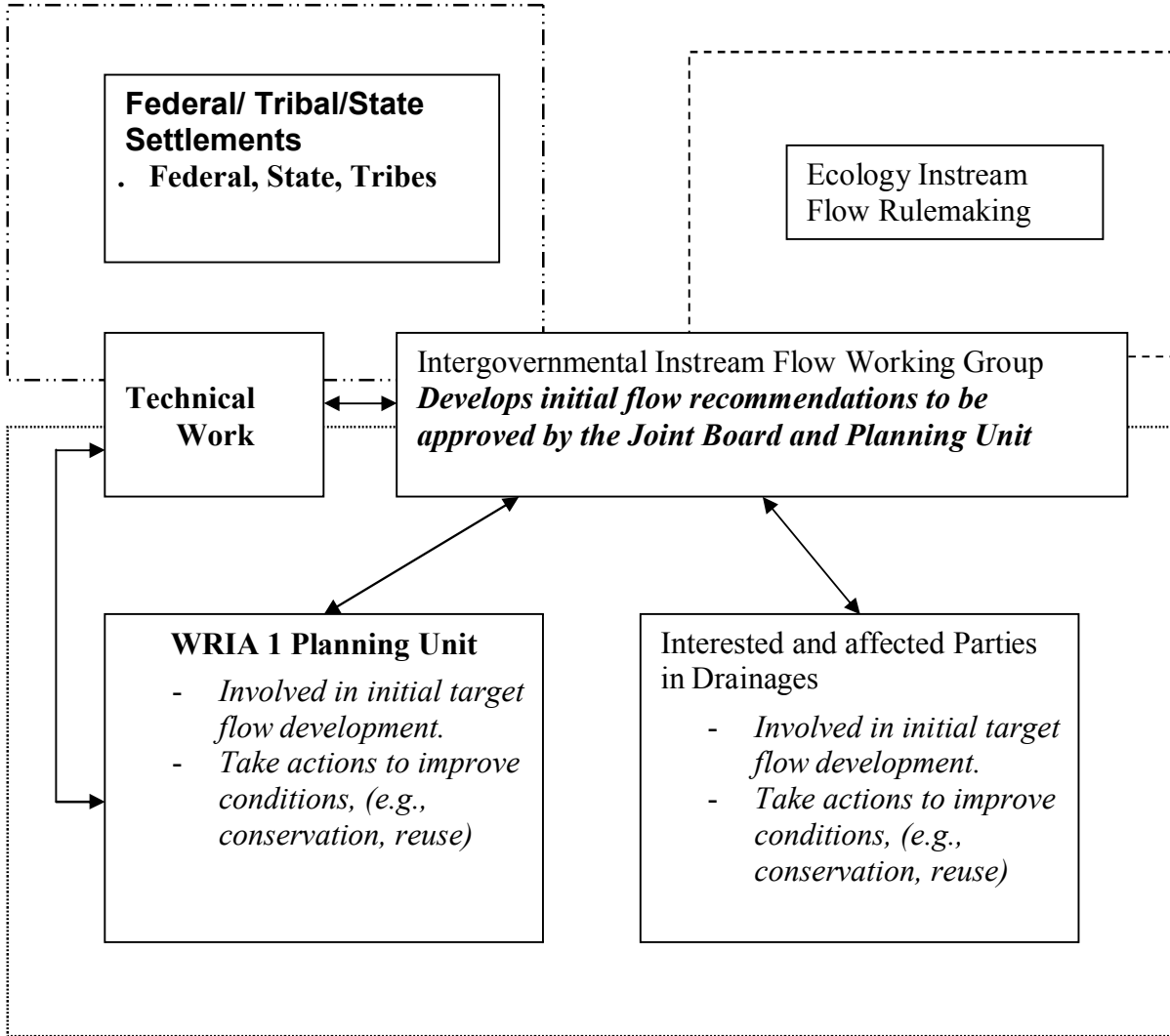
724

725 Following the above adoption the regulatory instream flow adoption process will utilizes the flows
 726 recommended by the IIFWG and approved by the Joint Board and Planning Unit. The locally
 727 approved regulatory portion of the flows is the basis for two formal adoption processes which *take*
 728 *place outside the WRIA 1 Project*. The two adoption processes are state rulemaking conducted by
 729 Ecology and a Federal/Tribal/State settlement process as requested by the Tribes and State (pending
 730 policy review) to resolve water and other claims with the Federal government. Parties involved in
 731 the Federal/Tribal/State settlement process will be asked to agree to take the locally approved flows
 732 into the process for acceptance or rejection. If the Federal/Tribal/State settlement process rejects
 733 the flows, the flows would iterate back to the IIFWG and the local process for review and approval.
 734 If the local process were to declare an impasse the decision would default to the Federal/Tribal/State
 735 settlement process. Ecology’s rulemaking is a defined process with public input and review and if
 736 Ecology receives additional information during these hearings that lead to changes to the
 737 recommended flows, the IIFWG will be asked to review any proposed changes to the recommended
 738 flows.

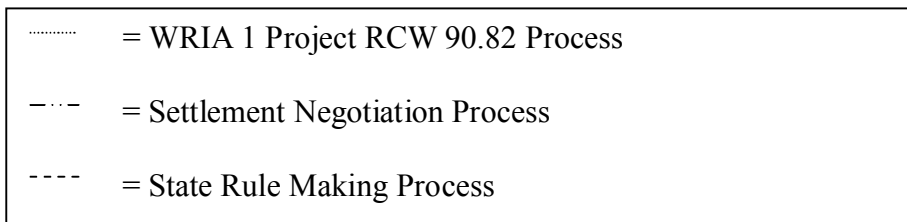
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739 The chart below illustrates the participants in the adoption processes. The chart also shows how the
740 rulemaking process occurs and the Federal/Tribal/State settlement process occurs “outside” the
741 WRIA 1 Project, but with overlap occurring in the form of the IIFWG.
742

743 **ISF Action Plan Adoption Process Flow Chart**



744
745
746



747
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750 **Federal/Tribal/State settlement process**

751
752 Outside the WRIA 1 Project, a negotiated Federal/Tribal/State settlement is reached through the
753 multiple step negotiated process described in the document *Federal Reserved Water Rights-The*
754 *Negotiated Settlement Option* (IIFWG, November 5, 2003) found in Appendix II. The steps in the
755 negotiated settlement flow chart are: 1) preparation, decide who participates; 2) reach local
756 agreement (this process' step 2 includes flow selection, Joint Board and Planning Unit flow
757 approval, and rule making); 3) final authorization by state and local parties; 4) federal review and
758 approval; 5) tribal referendum; 6) federal approval; 7) funding the settlement 8) implementation of
759 settlement including consent decree. (The negotiated settlement is filed as a legal action requesting
760 a consent decree in federal court.)
761

762 If successful the negotiated settlement option will resolve tribal claims and may bring federal
763 money to the WRIA, and could result in senior tribal rights to instream flows for fish and water
764 consistent with the 1855 Treaty of Point Elliot. It is also possible that federal and state legislation
765 may be needed to execute the terms of a settlement agreement and this legislative action may affect
766 the timing of any judicial action.
767

768 **State Rule Making**

769 After local agreements are reached on flows, state rule making may also be required to modify the
770 current Chapter 173-501 WAC on flows and to trigger implementation actions by State agencies.
771 State rule making provides for representation, public education and involvement, and public
772 hearings and will be an opportunity for anyone who chose not to participate earlier to be heard.
773 However, state rule making alone will not resolve tribal claims and will not result in certainty or
774 finality. (See definition of priority date in Definition of Terms, Appendix I.)
775

776 Under RCW 90.82.040, if there is no Planning Unit agreement on approval of flow
777 recommendations within four years of when funds were first received, Ecology *may* initiate rule
778 making and has two years to set flows. Section 080 of Chapter 90.82 RCW describes the rule
779 making process after the Planning Unit makes recommendations on flows. When Ecology proposes
780 an instream flow rule negotiated by a Planning Unit, it is obligated to follow the State
781 Administrative Procedure Act (APA)(Chapter 34.05 RCW). If the planning effort was sufficiently
782 broad and thorough, it most likely will be complete, consistent with legal requirements, and have
783 captured or considered most all of the views in the flow deliberations. However, if during the APA
784 review process, concerns are identified that the State concludes may require a substantive change to
785 the flow recommendation, the State will refer the flow recommendations/proposed rule back to the
786 instream flow selection group for further consideration. The State reserves its statutory authority to
787 proceed with rulemaking if, in its judgment, an amended flow recommendation acceptable to the
788 State is not timely developed.
789
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DRAFT SUBJECT TO LEGAL REVIEW**VII. Recommended Instream Flow Enforcement Plan**

796
797
798 Compliance and enforcement issues will be identified, discussed, and recommended in the drainage
799 unit level discussions. At some point in this process the IIFWG will recommend to the Joint Board
800 and Planning Unit modifications to the Plans compliance and enforcement sections for
801 implementation by the WRIA 1 Project. It is currently recommended that the plan for compliance
802 with instream flows contain the four elements outlined in the WRIA Wide Compliance Program and
803 be consistent throughout the WRIA:

- 804 • Education
 - 805 • Technical Assistance
 - 806 • Formal Enforcement
 - 807 • Compliance Monitoring
- 808

809 Therefore, enforcement will begin as an information sharing effort during workshops with affected
810 parties in the drainages. Technical assistance will include discussion with affected parties of
811 options such as flow contracts, submitting water right change applications to resolve some
812 compliance problems if possible, and other compliance strategies. After target flows are approved
813 by the Joint Board and Planning Unit and water users have evaluated the flow contract option,
814 enforcement against unpermitted water users without flow contracts should begin. The local
815 negotiation process will define how enforcement will be conducted and identify the appropriate
816 authorities for implementation. At some point in the process formal adjudication of existing claims,
817 permits and certificates will be required to determine their official extent. This step will also create
818 a legal forum to determine the extent of their rights for holders of claims, permits or certificates
819 who have chosen not to participate in the instream flow negotiation process.

820
821

VIII. Recommended Instream Flow Implementation and Funding Plan

822
823 This Action Plan is intended to be an integral part of the WRIA 1 Project. A number of the
824 outcomes from this Action Plan will feed into other WRIA 1 programs. The flow recommendations
825 clearly will be used in a number of areas. It is also the intent of this Action Plan that the need for
826 compliance and enforcement be taken up as part of the ongoing WRIA 1 Project with input from
827 this Action Plan.
828

829
830 The reverse is also true in that for this Action Plan to achieve the goals set forth, WRIA 1 work on
831 ground water will be required. The interaction of ground and surface water and the way in which
832 ground water supports instream flows is critical to managing instream flows especially during low
833 flow periods. Also understanding the storage potential and release timing issues of the ground
834 water aquifers is important when considering how to store more water for both instream and out of
835 stream uses. The ground water work will move forward in concert with this ISF Action Plan.
836

837 The interrelatedness of water quantity, water quality, instream flow and fish habitat makes the
838 funding support for the entire WRIA 1 Project an important single package. The costs should be
839 looked at in aggregate and adjusted as a collective to facilitate being able to move forward in a
840 cooperative collective fashion.
841

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842 The value of the WRIA 1 Project is its cooperative nature and being able to maintain that aspect is
843 important since it will enable the WRIA 1 Project participants to attract significant Federal and
844 State grant funding. An important aspect of bringing in a Federal team to engage in the proposed
845 Federal/Tribal/State settlement process is that it is the only way that finality and certainty goals can
846 be achieved and the solution to tribal claims under these settlement processes usually involves
847 Federal funding of large projects to resolve the claims. Everyone benefits and the funding is
848 potentially greater if there is a cooperative local negotiation aspect to support the settlement
849 process. The alternative to the current cooperative process is significantly more adversarial. The
850 history of disputes in the western U.S. over water is one of significant litigation and costly court
851 battles. The current WRIA 1 Project is on a path to substantially avoid costly litigation and court
852 battles.

853
854 However, political will is required to financially support the process and maintain a long-term
855 vision for a cooperative future. Staff will be presenting a funding package for the WRIA 1 Project
856 including this Action Plan in the near future along with the first draft of the WRIA 1 Plan.
857

858 In the meantime it is the hope of staff that everyone can focus on the details of this Action Plan and
859 understand and appreciate the linkages with other aspects of watershed management under the
860 WRIA 1 Project.

861
862

DRAFT SUBJECT TO LEGAL REVIEW863 **APPENDIX I– Definition of Terms**

864

865 **Achieving Flow Settings** - The process of ensuring that there is sufficient water in streams to
866 satisfy the instream flow requirements adopted by rule-making and/or other processes.

867 **Adaptive management** - A process whereby management decisions can be changed or adjusted
868 based on additional biological, physical, or socioeconomic information. In the context of instream
869 flow, adaptive management can result in higher or lower instream flow requirements.

870 **Adjudicated certificate** - A document issued pursuant to RCW 90.03.240 to evidence a water right
871 adjudicated under the terms of an adjudication through a Superior Court.

872 **Adjudication** - A general adjudication of water rights determines the validity and extent of existing
873 water rights in a specific geographic area. An adjudication is a legal process, generally conducted
874 through the superior court in the county in which the water is located. An adjudication does not
875 create new rights, it only confirms existing rights.

876 **Adopting Flow Settings** - The process of finalizing instream flow requirements by establishing
877 instream flows as water rights with a specific priority date.

878 **Affected Parties**- The property owners, water right document holders (certificate, permit,
879 application, claim), the PU Caucuses, the Nooksack Indian Tribe, and the Lummi Nation.

880 **Appropriation of water** - The process of legally acquiring the right to specific amounts of public
881 water through application of the water to beneficial use.

882 **Aquifer** - A geologic formation that contains water.

883 **Availability - Water** that is not only physically available, but which has not been previously
884 appropriated by another person or which is not required to satisfy instream flows (see physical water
885 availability).

886 **Base Flow** - Streamflow originating entirely from ground water discharging to the stream. Also
887 used to refer to a level of streamflow established in accordance with provisions of Chapter 90.54
888 RCW required in perennial streams to preserve wildlife, fish, scenic, aesthetic, and other
889 environmental and navigational values. WAC 173-500-050 (3)

890 **Basin** - A region in which rainfall or snowmelt water will flow toward a single point. Thus, it is
891 any hollow or trough in the earth's crust, whether filled by water or not. A basin is the total area
892 drained by a river and its tributaries. Used interchangeably with watershed.

893 **Beneficial use** - (1) the use of water for domestic, stock watering, industrial, commercial,
894 agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and
895 enhancement, shell fish and other aquatic life, navigation, recreation, thermal power production,
896 preservation of environmental and aesthetic values, and all other uses compatible with the
897 enjoyment of the public waters of the state, or (2) the measure of a water right based on the amount
898 of water applied in a reasonable manner without waste.

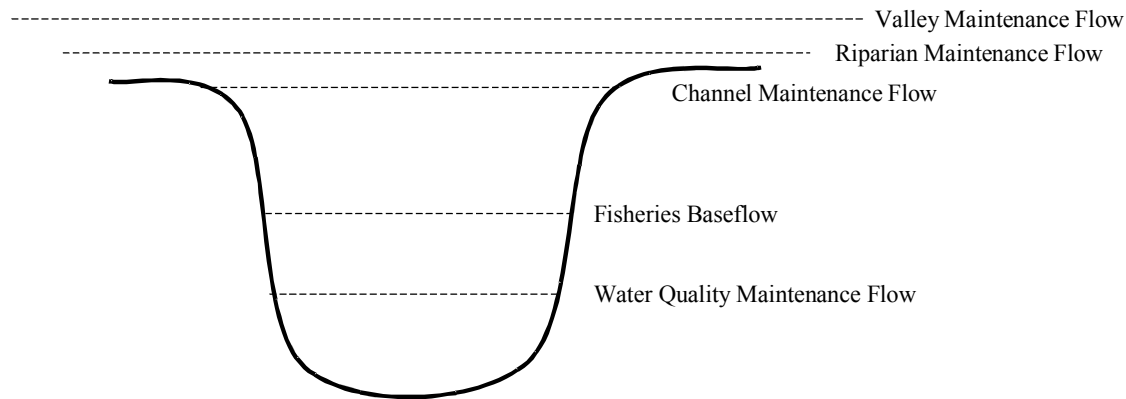
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- 899 **Certificate** - A document issued pursuant to Chapters 90.03 or 90.44 RCW to evidence a water
900 right perfected under the terms of the water right permit.
- 901 **Change Application** - The standard form, which when completed and filed with Ecology, is the
902 first step toward changing a water right.
- 903 **Channel-maintenance flow** - (1) The minimum streamflow to sustain biota; (2) range of flows
904 within a stream from normal to peak runoff and may include, but is not limited to, flushing flows or
905 flows required to maintain the existing natural stream channel and adjacent riparian vegetation.
- 906 **Clean Water Act** - Growing public awareness and concern for controlling water pollution led to
907 enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977,
908 this law became commonly known as the Clean Water Act. The Act established the basic structure
909 for regulating discharges of pollutants into the waters of the United States. It gave EPA the
910 authority to implement pollution control programs such as setting wastewater standards for industry.
911 The Clean Water Act also contained requirements to set water quality standards for all contaminants
912 in surface waters. The Act made it unlawful for any person to discharge most pollutants from a
913 point source into navigable waters, unless a permit was obtained under its provisions and
914 recognized the need for planning to address the critical problems posed by non-point source
915 pollution.
- 916 **Consent Decree** - A contract of the parties entered upon the record with the approval and sanction
917 of a court of competent jurisdiction, which cannot be nullified or set aside without the consent of
918 the parties thereto, except for fraud or mistake. Has the same force and effect as any other
919 judgment. Because the agreement of the parties waives exception to irregularities in the
920 proceedings occurring prior to the time of agreement, appeal from a consent decree/consent
921 judgment is limited to attack for mistake, fraud, or lack of jurisdiction.
- 922 **Diversion** - (1) a physical structure constructed to take surface water from its natural course into a
923 canal, pipe or other conduit by means of gravity flow or by pumping, or (2) the action of taking
924 water from a stream or other body of water.
- 925 **Ecological Flow Regime** - instream flow levels needed to preserve, protect, and restore the
926 physical, biological, and chemical aspects of a stream. As shown in Figure 5, can be divided into
927 five functional categories: 1) water quality maintenance, 2) fisheries baseflow, 3) channel
928 maintenance, 4) riparian maintenance, and 5) valley maintenance. Each of these flows components
929 were identified by the September 1999 conference (Hardy 2000) participants as essential for
930 maintaining the ecological health of the stream system. Please note this is a diagrammatic
931 representation and does not represent an absolute relationship between the flows identified (i.e.,
932 water quality maintenance flow may or may not be less than the fisheries baseflow).
- 933 Briefly, the water quality maintenance flow is the quantity of water needed to assimilate wastewater
934 and still achieve compliance with applicable water quality standards. The fish habitat maintenance
935 flow is the minimum instream flow needed to support fish populations during different life stages.
936 The channel maintenance flow is the minimum amount of water needed to perform processes such
937 as sediment transport. The channel maintenance flows impact the long-term characteristics of
938 aquatic habitat such as the distribution, quantity, and quality of pools and riffles. Riparian
939 maintenance flows are the flows needed to maintain a productive plant and animal community

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940 along the stream corridor. Valley maintenance flows are catastrophic flood events and are generally
 941 not quantified.

Figure 5. Hypothetical illustration of the flow components essential for maintaining the ecological health of the stream system



942 Request to change the term “Fisheries Baseflow” in Figure 5 above changed to “Fish Habitat
 943 Maintenance Flow”.

944 **Ecology** - The department of ecology.

945 **Endangered Species Act** - The 1993 Endangered Species Act requires that all Federal agencies
 946 undertake programs for the conservation of endangered and threatened species, and are prohibited
 947 from authorizing, funding, or carrying out any action that would jeopardize a listed species or
 948 destroy or modify its "critical habitat" [section 7].

949 – **Flow, Optimum** - That instantaneous discharge which provides the best set of hydraulic
 950 conditions for a selected life history stage, species, or fishery. (Bahya 1979)

951 **General adjudication of water rights** - A Washington State Superior Court legal proceeding
 952 initiated by the department of ecology as plaintiff to determine the validity, priority and extent of
 953 existing water rights in a given geographic area or watershed. An adjudication is a form of a quiet
 954 title action.

955 **Ground water** - All waters that exists beneath the land surface or beneath the bed of any stream,
 956 lake, or reservoir, or other body of surface water within the boundaries of Washington State,
 957 whatever may be the geological formation or structure in which such water stands or flows,
 958 percolates or otherwise moves.

959 **Hydraulic continuity** – The natural interconnection of ground water and surface water bodies. An
 960 aquifer is in hydraulic continuity with wetlands, lakes, streams, rivers or other surface water bodies
 961 if it discharges, recharges, or otherwise affects the surface water bodies.

962 **Instream** - Within the natural stream channel.

963 **Instream flow** - The level of flow determined by the department to be necessary to protect instream
 964 resources. RCW 90.03.345 states that “the establishment of . . . minimum flows or levels under

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965 RCW 90.22.010 or 90.54.040 shall constitute appropriations with in the meaning of this chapter
966 with priority dates as of the effectives dates of their establishment.” (i.e. they are water rights)
967 [parenthetical material added]

968 **Instream Flow Requirement** - Instream flow is the amount of water flowing through a natural
969 stream course that is needed to sustain the instream values at an acceptable level. Instream values
970 and uses include protection of fish and wildlife habitat, migration, and propagation; outdoor
971 recreation activities; navigation; hydropower generation; waste assimilation (water quality); and
972 ecosystem maintenance which includes recruitment of fresh water to the estuaries, riparian
973 vegetation, floodplain wetlands, and maintenance of channel geomorphology. Water requirements
974 sufficient to maintain all of these uses at an acceptable level are the "instream flow requirements."
975 (USFWS 1993)

976 **Instream Values** - defined by law (RCW 90.54.020(3)(a)) as fish, wildlife, recreation, aesthetics,
977 navigation, water quality, and other environmental values subject to protection through
978 establishment of minimum instream flows.

979 **Instream Resources** - Resources, values, or activities, such as fish, other organisms, navigation,
980 recreation, hydropower, and water quality, which require water in the stream channel.

981 **Low flow** - Flow level limitations appearing as provisions on permits and certificates issued by the
982 department or its predecessors.

983 **Minimum Instream Flow** - streamflows established by administrative rule or other means for the
984 purpose of protecting and preserving instream values. Flows adopted by rule are considered a water
985 right with a priority date as of the date of their adoption. Also called "instream flows" and "base
986 flows" in Washington statutes, and generally referred to as "instream flows".

987 **Mitigation** - A wide variety of measures (such as siting, facility design, operation, and retrofit)
988 which the department determines are defensible, technically feasible, and environmentally sound
989 that are taken to diminish the impact of an action. It may include, but is not limited to not
990 implementing the decision, taking affirmative steps to avoid the impact, rectifying through
991 restoration or compensating by replacing or providing substitute resources; changes in siting,
992 facility design or operation; retrofitting; transfer or protection of equivalent resources.

993 **Permit** - A document issued by the department pursuant to Chapter 90.03 or 90.44 RCW in
994 response to a report of examination that conveys authority to appropriate water and construct
995 physical works associated with the appropriation. To the extent water is not put to use, a permit is
996 an inchoate water right.

997 **Prior Appropriation Doctrine** - the system for allocating water to private individuals and public
998 institutions used in most Western states, *including Washington*. The prior appropriation doctrine is
999 based on the concept of "First in Time, First in Right." The first person to take a quantity of water
1000 and put it to "Beneficial Use" has a higher priority of right than a subsequent user. Under drought
1001 conditions, higher priority users are satisfied before junior users receive water. Appropriative rights
1002 awarded under state water law can be lost through nonuse (i.e., "use it or lose it") in a formal
1003 process known as relinquishment; they can also be sold or transferred apart from the land. In
1004 contrast, federal reserved water rights and tribal reserved water rights are not subject to
1005 relinquishment due to nonuse (Winans citation).

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1006 **Priority** - Priority determines the order of rank of the rights to use water in a system. Under the
1007 Prior Appropriation Doctrine, priority is the concept that the person first using water for a beneficial
1008 purpose has a right superior to those commencing their use later. The priority date of a Federal
1009 reserved water right is the date the land is withdrawn from the public domain. Priority is important
1010 when the quantity of available water is insufficient to meet the needs of all those having rights to
1011 use water from a common source. Under the prior appropriation system, shortages are not shared.
1012 Some Western State statutes contain priority or preference categories of water use, under which
1013 higher priority uses (such as domestic) have first right to water in times of shortage, regardless of
1014 priority date. There may also be constraints against changes or transfers involving these priority
1015 uses. (USFWS 1993)

1016 **Recharge of ground water** - The processes by which surface water percolates below the rooting
1017 zone of soil and reaches the saturated zone in an aquifer.

1018 **Regulatory Flow** -

1019 **Reserved Water Rights** - This class of water rights is a judicial creation derived from *Winters v.*
1020 *United States* (207 U.S. 564, 1907) and a subsequent federal case law, which collectively hold that
1021 when the federal government withdraws land from general use and reserves it for a specific
1022 purpose, the federal government by implication reserves the minimum amount of water
1023 unappropriated at the time the land was withdrawn or reserved to accomplish the primary purposes
1024 of the reservation. Federal reserved water rights may be claimed when Congress has by statute
1025 withdrawn lands from the public domain for a particular federal purpose or where the President has
1026 withdrawn lands from the public domain for a particular federal purpose pursuant to congressional
1027 authorization. (National Research Council 1992)

1028 **Rulemaking** - The process, articulated by the Administrative Procedures Act (see Chapter 34.05
1029 RCW), whereby Washington State government agencies adopt regulations as part of the
1030 Washington Administrative Code (WAC) in order to implement the statutes embodied in the
1031 Revised Code of Washington (RCW).

1032 **Senior water right** - Any water right with a priority date earlier than the water right under
1033 consideration.

1034 **Surface water** - (1) a body of water such as a stream, a lake, or spring at or on the land surface, or
1035 (2) water flowing in or overland to a stream or present in a lake, pond, or wetland.

1036 **Target Flow** - Federal agencies use the term target flow in referring to an amount of water in a
1037 stream to meet fish needs. Under the Endangered Species Act (ESA), the National Marine Fisheries
1038 Service and the US Fish and Wildlife Service use target flows as their goal to provide adequate
1039 flows for ESA-listed fish. A target flow is to be biologically-based, achievable, and would provide
1040 sufficient water for properly functioning habitat.

1041 **Time Immemorial** - A priority date under the Appropriation Doctrine of time 0000, essentially
1042 making such water rights the most senior right possible.

1043 **Treaty Reserved Right/Treaty Rights** - Rights of Indian Tribes that were confirmed in the
1044 Stevens Treaties. These rights have also been affirmed by judicial decisions. These rights include
1045 the right of Tribal members to harvest fish resources throughout their usual and accustomed fishing

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1046 areas. Several U.S. Supreme Court Decisions have also recognized that any rights not specifically
1047 given up in the treaties are rights retained by the Tribes.

1048 **Vested water right** -A right to use surface water established prior to the effective date of chapter
1049 90.03 RCW or to use ground water prior to the effective date of the 1945 ground water code
1050 (chapter 90.44 RCW).

1051 **Water Resource Inventory Area or (WRIA)** - One of 62 geographic areas of the state based
1052 generally on drainage patterns and demarcated on the map in WAC 173-500-990.

1053 **Water right** - A legal right to make beneficial use of public waters of the State of Washington.

1054 **Water Right Application** - The standard form which is filed with Ecology to request that a permit
1055 be issued for the use of water, and is the first step toward establishing a water right.

1056 **Water right claim** - A claim to a vested right to withdraw or divert and make beneficial use of
1057 public surface or ground waters of the state, filed on a form provided by the department and
1058 registered in accordance with Chapter 90.14 RCW.

1059 **Well** - Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise
1060 constructed when the intended use of the excavation is for the location, diversion, artificial
1061 recharge, or withdrawal of ground water. Well includes water-supply well and resource protection
1062 well. Well does not mean excavations excluded in Chapter 173-160-WAC.

1063 **Withdrawal** - (1) the physical structures constructed to take ground water from an aquifer into a
1064 pipe or other conduit by means of gravity flow or by pumping, or (2) the action of removing ground
1065 water from an aquifer.

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1067 **Appendix II**

1068

1069 **Federal Reserved Water Rights- The Negotiated Settlement Option (IIFWG, 2003)**

1070

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CRITERIA FOR EVALUATION OF PILOT PROJECTS v 0.6 01/22/03

Procedural Criteria for determining when proposed pilot projects are ready for evaluation:

To receive further consideration a proposed pilot project must meet the following procedural criteria:

- **Timeliness:** the proposed pilot project must be presented in complete form (as defined in Section 1.2 below) by a due date certain, said date to be established as the planning process proceeds. All WRIA 1 participants shall be notified well in advance of such due dates.
- **Completeness:** a proposed pilot project must be presented in such a manner that it is capable of full evaluation, which requires that it be presented with a specific budget, timeline, list(s) of required data sets and input parameters, complete list of project action items, location(s) of project actions, list of obligated parties and what each party is obligated to perform and clear linkages between the action items and the goals and objectives of the Watershed Management Plan that the proposed pilot project is intended to address. If it is appropriate for a given proposed pilot project to be processed by the DSS Scenario Builder Module, all inputs necessary to that module will be provided.
- **Relevance:** a proposed pilot project must clearly address one or more of the four major elements (quantity, quality, instream flow, fish habitat) as identified in the Watershed Management Plan. Projects should be designed so as to provide the means to assist in further plan development by evaluating management options and/or developing the DSS.
- **Capacity for evaluation:** pilot projects must be designed so that there will be sufficient data collected to evaluate the proposed project's effectiveness and must, if feasible, incorporate checkpoints during project implementation to allow for interim evaluation and adaptive management..

Feasibility Criteria: To receive further consideration a proposed pilot project must meet the following feasibility criteria:

Legal:

- The proposed pilot project shall satisfy the obligations and requirements for certain agencies, as set forth in the Watershed Management Act, RCW 90.82.130 (3) and RCW 90.82.130 (4).
- The proposed pilot project shall not require entities to undertake actions for which they have insufficient legal authority, or if there are other regulatory or statutory barriers to implementation. If either of these conditions applies, is there a clear pathway to resolution of same, within the time frame required to make the pilot project viable, which pathway has a reasonable probability of success? If not, such pilot projects may not be included in the initial elements of the plan, but may

be incorporated into the long-range elements, to be implemented if and when their constraints are removed.

Financial:

- The proposed pilot project must be affordable to those who are asked to pay for it, where affordable means that the party or parties in question is capable of bearing the cost throughout the life cycle of the proposed pilot project.

Consistency with rest of Watershed Management Plan:

- The pilot projects adopted in the initial Watershed Management Plan shall not conflict with one another or with the rest of the Watershed Management Plan.

Administration and staffing:

- Proposed pilot projects shall not require implementing entities to act beyond their organizational capacities, in terms of personnel or any other limiting organizational resources.
- The proposed pilot project shall satisfy the obligations and requirements for certain agencies, as set forth in the Watershed Management Act, RCW 90.82.130 (3) and 90.82.130 (4).

Technical feasibility:

- Proposed pilot projects shall be scientifically and technically sound and implementable within an agreed-upon specific time frame.

Substantive Criteria:

Preference shall be given to pilot projects that meet any of the following:

- They are designed to help achieve minimum instream flows requirements.
- They simultaneously address three or all four of the major elements of the Watershed Management Plan.
- They promise to provide measurable progress within the first water year of project initiation.
- Landowners or other entities needed for participation are willing and able to participate on a voluntary basis.
- They are located within Detailed Management Areas or within other drainages formally selected for special attention through the WRIA 1 process..
- There is evidence that similar types of projects have demonstrated positive results under different circumstances or in other geographic locations.

- They can be coordinated with, or augment, other programs and projects that are deemed to further the goals of the WMP.
- They are supported with matching funds.
- They receive unanimous support among all WRIA 1 Joint Board and Planning Unit representatives or their successors.

Other Management Recommendations

Agriculture Water Reclamation and Reuse

Recommendation

Investigate water reclamation and reuse opportunities: irrigation as a substitute for existing water usage, and stream augmentation for Fishtrap, Bertrand, and Dakota Creeks.

Proponents

- Whatcom County Agricultural Preservation Committee
- WSU Cooperative Extension, Whatcom County
- Washington Water Research Center
- Public Utility District No.1
- Lummi Nation

Location/Site Description

Irrigated agriculture, specific location to be determined

Purpose/Objectives

Maintain irrigated agricultural land use. Provide additional water for non-irrigation needs by substituting wastewater for existing irrigation water usage. Provide water for stream augmentation for Fishtrap, Bertrand, and Dakota Creeks.

Appropriate segments of community will:

- Understand and comply with regulatory constraints of water reclamation and reuse
- Understand and adopt agricultural management practices for reclaimed and reused wastewater
- Understand and consider feasibility of water reclamation and reuse (economic, agronomic, regulatory, public health protection)

Issues Addressed

- Competition for water resources

- Preservation of agriculture as a desired land use
- Reuse of water resource
- Stream augmentation

Information Goals

- Educate audiences about water reclamation and reuse regulations
- Educate audiences about water reclamation and reuse technologies
- Educate audiences about agricultural irrigation use practices with wastewater

Performance Goals

- Completion of wastewater source survey and prioritization
- Completion of water reuse for irrigation purposes feasibility study
- Irrigation water reuse demonstration (assuming supportive feasibility study)

Implementation Plans/General Schedule

- Identify and categorize wastewater sources that have reclamation or reuse potential
- Identify possible water reclamation and reuse sites that are proximate to sources
- Identity demonstration project partners and opportunities, and funding sources
- Conduct feasibility study
- If appropriate, pursue demonstration project

Budget/Resource Requirements

Task	Schedule	Lead	Resource Needs
Wastewater source survey	Summer 2004	WCAPC	In Kind & Budget Request TBD
Irrigation water reuse feasibility study	Winter 2004	WSU Coop Ext.	In Kind & Budget Request TBD
Water Reclamation/Reuse education	Winter 2004	WSU Coop Ext	In Kind & Budget Request TBD

Roles and Responsibilities of Implementing Parties

Project roles are identified in the previous table. The roles and responsibilities associated with a demonstration project will be included in the feasibility study report along with budget and scope estimates.

Monitoring and Adaptive Management

The monitoring and adaptive management will entail monitoring of the water used and the water reclaimed and the extent to which the reclaimed water is used to quantify the effectiveness of the project. The associated monitoring will be defined as part of the feasibility study and the pilot demonstration project.

Relationship to Other Programs

Other recommended WRIA 1 Watershed Management Programs that are related to the Agriculture Water Reclamation and Reuse project include: Water Use Efficiency, Water Use Tracking, Comprehensive Irrigation District Management Program, Instream Flow Selection and Adoption Action Plan, Natural Resource Policy Integration.

Other Management Recommendations

Deep Aquifer Supply and/or Storage

Recommendation

Deep Aquifer Supply and/or Storage

Location/ Site Description

WRIA-wide but the most likely focus will be Western Lowlands from Sumas Mountain to the coast

Purpose/Objectives

- Explore the feasibility of deep water aquifer as new long term water supply and/or for storage
- Compile information on deep water well drilling that has occurred
- Compile known information about water quality and water quantity at depths
- Compile what is known about recharge to the deep aquifer (lateral component, vertical percolation)
- Identify potential challenges specific to and associated with use of deep-water aquifers

Issues Addressed

The program is designed to address two issues:

- Water supply limitations
- Potentially reducing impacts to instream flows (e.g., if there are water supplies available from deep aquifers that have less impact on streamflows than shallow aquifers, opening up a variety of management possibilities)

Information Goals

The program is designed to:

- Compile deep water aquifer information

- Determine data needs to pursue further analysis of deep water aquifers as potential sources of new supply or storage
- Identify challenges and opportunities associated with the continued pursuit of using deep aquifers as a source of supply or storage

Performance Goals

The performance benchmark for this program is a written report summarizing the findings.

Implementation Plans/General Schedule

Deep aquifers have been identified as one of the management options that should be considered as a potential source of additional water supplies or for storage opportunities within WRIA 1. There have been a number of studies and projects within the WRIA aimed at exploring deep water aquifers as a potential source of supply but there is no document that summarizes the findings including what is known (and not known) about water quality and water quantity at depth, and the source of recharge for these aquifers. This type of information will be needed to fully evaluate the feasibility of using deep-water aquifers as a source of supply or storage. The purpose of this project is to provide such a report along with a summary of the potential challenges that would have to be addressed associated with the use of these aquifers.

Budget/Resource Requirements

To be determined

Roles and Responsibilities of Implementing Parties

A lead for this project is needed. The lead's first task would be to identify a strategy and associated resources required to implement the project.

Monitoring and Adaptive Management

Not applicable.

Relationship to Other Programs

This project would build on work conducted through other programs and studies.

Other Recommendations

Evaluate Feasibility of Importation from Skagit River Basin

Recommendation

Evaluate the Feasibility of Importation of Water from the Skagit River Basin, including Ross Lake and Baker Lake

Location/ Site Description

Ross Lake, Baker Lake, or lower Skagit River area

Purpose/Objectives

The Skagit River has been suggested as a potential source of water for Whatcom County and WRIA 1 at various times and is included as a possible management option in the WRIA 1 Management Option Catalog. Potential sources include water from Ross Lake or from Baker Lake, a tributary to the Skagit River. Imported Skagit River water could also be purchased from the Skagit PUD and brought by pipeline from the current pipe in the Lake Samish/Alger area.

The purpose of this feasibility evaluation is to determine whether importation of Skagit River water is a viable management option for consideration now or in the future in terms of legal, environmental, economic, and/or political constraints.

Issues Addressed

- Legal right to the water being provided
- Infrastructure costs to get the water to WRIA 1
- Impairment of any existing water rights
- Availability of suitable rights of way to move the water to WRIA 1

Information Goals

To identify the feasibility of importing water from the Skagit in terms of legal, environmental, economic, and political constraints. The immediate information goals would focus on work conducted by Ecology staff as described below.

Performance Goals

Complete initial evaluation by Ecology staff.

Implementation Plans/General Schedule

The estimated amount of time that would be required to conduct the feasibility evaluation is one month.

Budget/Resource Requirements

No additional resources would be requested beyond Ecology staff time.

Roles and Responsibilities of Implementing Parties

Ecology staff will conduct the initial evaluation in terms of the water rights analysis and general analysis of the potential hurdles that would need to be overcome. WRIA 1 Project staff would review Ecology's evaluation and determine a further course of action, if any.

Monitoring and Adaptive Management

Not applicable at the feasibility stage.

Relationship to Other Programs

Other Management Recommendations

Feasibility Trans-Basin Importation from British Columbia

Recommendation

Feasibility Trans-Basin Importation from British Columbia

Location/ Site Description

The feasibility analysis will consider border-town receivers such as Sumas and Blaine as well as municipalities more distant from the border.

Purpose/Objectives

Transferring water from one surface water basin to another is a common occurrence in WRIA 1 as exemplified by two of the major water users¹ and numerous smaller users. It has also been recommended in the Coordinated Water Supply Plan as an approach that could be used to meet regional needs. Typically, interbasin water transfers are limited to those within the WRIA but an additional option that is listed in the management option catalog is the potential to transfer water from the British Columbia to WRIA 1.

The purpose of the program is to conduct a feasibility analysis to better understand the issues associated with importing water from British Columbia. The analysis will help clarify why the option has not been pursued to date and to document the challenges that would need to be considered by anyone contemplating it in the future. Objectives include:

- Identify regulations (local, state, provincial, federal) applicable to construction and operation of a cross-border water pipeline
- Identify legal and political context of importation of water from Canada to US (NAFTA, etc.)
- Analysis of the regulations and legal/political information
- Evaluation of the feasibility of importing water in the near- and long-term.

¹ The City of Bellingham obtains a portion of its water from the Middle Fork of the Nooksack and it is transferred from there for use in coastal drainages. The PUD obtains water from the mainstem of the Nooksack and a portion of the water is used to supply customers in coastal drainages at Cherry Point.

Issues Addressed

This project is a feasibility evaluation and would not address any of the WRIA 1 water resource issues unless it was supported for further action. Potential issues that it may address if it were pursued further are:

- Water supply limitations for municipal and/or industrial use
- If importation resulted in a reduction in use of existing surface or groundwater supplies in WRIA 1, possible improvements could be achieved related to instream flows, fish habitat, and water quality.

Information Goals

The program would provide information on the issues associated with importing water from British Columbia.

Performance Goals

Written report summarizing findings

Implementation Plans/General Schedule

Initial work to summarize information obtained by the City of Sumas would be completed in the first quarter after Plan adoption.

Budget/Resource Requirements

\$5,000 and in-kind labor

Roles and Responsibilities of Implementing Parties

David Davidson (Small cities caucus) will conduct initial work summarizing information that the City of Sumas has on this topic.

Monitoring and Adaptive Management

Not applicable

Relationship to Other Programs

The Management Option Catalogue will be updated with the information obtained through this feasibility analysis.

Other Management Recommendations

Plan for Establishing, Funding, and Staffing a Water Rights Information Assistance Center

Recommendation

Plan for establishing, funding, and staffing a Water Rights Information Assistance Center within the Department of Ecology Bellingham Field Office.

Proponents

A Water Rights Information Assistance Center is a recommendation in the Water Rights Review Stage 2 Report (PUD, 2003).

Location/Site Description

The Water Rights Information Assistance Center (Center) will serve residents throughout WRIA 1. The Center should be centrally located to serve the likely users in the agricultural land and non-government water system operator community. Although the recommendation is to locate the Center central to all of WRIA 1, it is acknowledged that due to resource constraints the Center may be located within the Bellingham office.

Purpose/Objectives

The recommendation is to create a plan for establishing a Water Rights Information Assistance Center to provide water rights information and evaluations. The first step in creating a plan is to complete a needs assessment with the focus of the assessment being on surveys and/or interviews with likely users. The needs assessment will result in a report that documents likely users of the Center, specific tasks that will be performed by Center staff, budget, funding source, and schedule for implementing. The purpose of the Water Rights Information Assistance Center would be to assist the public in completing Washington State Department of Ecology change forms, new applications, and other water right documents. The Center will also assist the public in understanding, protecting, and complying with their water rights.

Issues Addressed

Issues that may be addressed by establishing a Water Rights Information Assistance Center include:

- Assistance with water right compliance

- Potential assistance with or contributing to the sorting and/or updating of water rights database for WRIA 1
- Outreach to individuals in need of technical assistance or that require an understanding of water right applications, transfers, and compliance issues
- Potential identification of individuals needing transfers or who are willing to transfer a water right
- Provide linkages to future local or state water banking or water marketing programs

Information Goals

Implementing the recommendation to plan for and then to establish a WRIA 1 Water Rights Information Assistance Center may provide information in the following area:

- Level of political and community support to provide funding to assist individuals in addressing water right issues.

Performance Goals

Written report on the outcomes of the needs assessment of likely users of the Water Rights Assistance Center. The report will include recommendations for pursuing the Center, responsibilities, and/or tasks, budget, funding source, and schedule for implementing.

Implementation Plans/General Schedule

Task	Schedule	Responsible Entity(s)	Budget Need
Conduct needs assessment of likely users.	Jan-March 2005	TBD	TBD
Written report on outcomes of needs assessment, staffing, budget, funding, and implementation schedule	June 2005	TBD	TBD

Budget/Resource Requirements

- Needs assessment budget: TBD
- Preparation and distribution of written report: TBD

Roles and Responsibilities of Implementing Parties

The lead(s) for conducting the needs assessment and preparing the written report describing the outcome have not been identified. The lead for implementing a Water Rights Assistance Center is the Washington State Department of Ecology.

Monitoring and Adaptive Management

- Completion of the written report on the need for and support of a Water Rights Assistance Center. If a need for the Center is identified, the written report will describe an effectiveness monitoring program.

Relationship to Other Programs

This effort is related to the following proposed WRIA 1 programs: Water Use Tracking, ISF Selection and Adoption Action Plan, and Compliance.

Other Management Recommendations

Review of Water Banking and Water Marketing as a Water Resources Management Tool

Recommendation

Conduct a comprehensive review of different approaches to creating a water bank and water market. Information gathered as part of the review should include identifying the various kinds of banks and water markets, their purposes, their advantages and disadvantages, and their effectiveness in achieving their goals. The review should result in a list of options that can be further evaluated for their feasibility as a water resource management tool in WRIA 1.

Location/Site Description

The review is being conducted for future application of water banking and water marketing WRIA-wide but primarily in the western lowlands of Whatcom County. The review will focus on regional examples but will include examples from other locations when appropriate.

Purpose/Objectives

The purpose of this recommendation is to identify the different approaches and purposes of water banks and water markets and their potential effectiveness as a water management tool for use in WRIA 1. Information from the completed review will be used to conduct further evaluations for feasibility of water banking and water marketing in WRIA 1, which may require the assistance of economic consultants.

Issues Addressed

Issues that may be addressed by water banks or water markets may include:

- Potential for providing more certainty for water users
- Encouraging conservation of existing water
- Removing the disincentive of relinquishment of unused water for water put in a water bank
- Potential for increasing stream flows with water from a water bank or through the use of a water market
- Potential improvement to fish habitat resulting from increased stream flows

Information Goals

Initially, a comprehensive review of the potential value of water banking and water marketing as a water resource management tool will provide information on approaches for water banks and markets in WRIA 1. After completing the review, identified options will be further

evaluated to determine the extent to which they can provide increased flexibility of water use in WRIA 1 and how they will help achieve instream flows. Information gained through the comprehensive review will also be used to update the WRIA 1 Management Options Catalog.

Performance Goals

Note that the performance goals listed below are specific to the recommendation of conducting a comprehensive review and evaluating water banking and water marketing options for use in WRIA 1. Any pursuit of options will require that performance goals be established specific to the option being considered.

1. Completion of a written review of water banking and water marketing options that includes information on the various kinds of water banks, their purposes, their advantages and disadvantages, and their effectiveness in achieving their goals.
2. Completed evaluation of options identified in the written report (Performance Goal #1) including budgets, schedules, staff resource requirements, and any legislative changes required to implement the options along with a recommendation for a preferred option.
3. Community and financial support to pursue the preferred option.

Implementation Plans/General Schedule

WRIA 1 Project staff will take the lead on completing the comprehensive review of options for water banking and marketing with technical assistance provided by Washington State Department of Ecology (Ecology). The comprehensive review will build on work completed to date including Ecology's review of water banking approaches west of the Mississippi River and the Roundtable Associates review of options for the Yakima Basin. A report summarizing the review findings will be submitted to WRIA 1 participants prior to proceeding with an evaluation of the findings. The written report will include a budget estimate and scope outlining the process for proceeding with the evaluation.

Schedule:

Initiate	Complete	Task	Responsible Parties
June 2004 (or upon approval by WRIA 1 participants)	3 months after initiation	Complete review of water banking and marketing options including identifying the various kinds of banks, their purposes, their advantages and disadvantages, and their effectiveness in achieving their goals	WRIA 1 Project Staff and Washington State Department of Ecology
September 2004 (or upon acceptance of completed report of options)	6 months after initiation	Pursue evaluation of water banking and marketing options for WRIA 1 as outlined in the findings report submitted under the task described above.	To be determined.

Budget/Resource Requirements

The estimate for resource requirements is limited to the completing the initial review, preparing the report, and estimating the scope and budget for the evaluation.

Staff Resources:

1. WRIA 1 Project Staff and/or WWU CEBR - 0.125 FTE (assumes approximately 20 hours per week for 13 weeks)
2. Washington State Department of Ecology Staff - 0.02 FTE (assumes approximately 40 hours over 13 week period)
3. Report copying and distribution will be the responsibility of the WRIA 1 Joint Board.

Roles and Responsibilities of Implementing Parties

WRIA 1 Project Staff – WRIA 1 Project Staff will complete the review of water banking and marketing approaches with the assistance of the Washington State Department of Ecology staff and others such as Western Washington University, Center for Business and Economic Research. The work will build on efforts completed by Ecology that included evaluating water banks west of the Mississippi and work completed by the Roundtable Associates for the Yakima Basin.

Washington State Department of Ecology (Ecology) – Initially, Ecology will provide a report of findings from the State’s evaluation of water banks west of the Mississippi River to the WRIA 1 Project Staff. Ecology also has a technical advisory committee evaluating the creation of a water bank in the Yakima Basin and will provide information from that effort as it becomes available. Further technical assistance will be provided by Ecology in terms of reviewing specific water banking and marketing proposals, the related water rights, and any needed changes.

Monitoring and Adaptive Management

The comprehensive review step of this recommendation will include information on the effectiveness of various water bank and water market approaches. The evaluation step that follows the completed review will need to include effectiveness monitoring and adaptive management recommendations specific to each option that is evaluated. It is likely to also involve contracting with an economic analyst.

Relationship to Other Programs

Whatcom Conservancy Board – If water banking and marketing options are pursued in WRIA 1, consideration will need to be given to the affected water rights and the process for making the necessary changes. The Whatcom Conservancy Board may be one option for changes that involve applications for changes in place of use or other types of transfers.

Bertrand Watershed Improvement District (WID) – The WRIA 1 effort to review water banking and marketing options will need to be coordinated with the Bertrand WID to ensure that there is not a duplication of efforts. It is assumed that if the Bertrand WID pursues a similar task as part of their efforts to develop a comprehensive irrigation plan, their focus will be specific to the Bertrand WID. The WRIA 1 effort will expand on the work of the Bertrand WID. The staff of the WID and WRIA 1 projects should collaborate on the scope and approach for completing the review of water bank options and subsequently the evaluation of feasible options.

WRIA 1 Instream Flow Selection and Adoption Action Plan (ISF Action Plan) – The WRIA 1 ISF Action Plan proposes to address instream flows on a drainage and WRIA-wide level. The recommendation to provide a review and evaluation of water banking and water marketing options as a tool to manage water resources will provide supporting information to WRIA 1

participants as they proceed with identifying management strategies as part of the ISF Action Plan.

Washington Water Rights Acquisition Program² - The Washington Water Rights Acquisition Program is a voluntary program that offers monetary compensation to water-right holders who are willing to revert all or a portion of their water right back to the state to benefit salmon. The program provides water right holders the opportunity to sell, lease, or donate their water where low stream flows limit fish survival. The water that is obtained through the program is returned to the stream or river from which it was originally withdrawn. The focus of the state program is on increasing stream flows in 16 basins across the state that are experiencing chronic water shortages, one of which is the Nooksack Basin. The WRIA 1 Review of Water Banking as a Water Resource Management Tool will build on and support the existing state Water Rights Acquisition Program.

² Information on the Washington Water Acquisition Program obtained from Washington Water Acquisition Program home page < <http://www.ecy.wa.gov/programs/wr/instream-flows/wacq.html> > and *Frequently Asked Question- Washington Water Acquisition Program*, Publication #02-11-013 Was

Other Management Recommendations

Summary of Process and Challenges Associated with Water Transfers

Recommendation

Summary of Process and Challenges Associated with Water Transfers

Location/Site Description

The feasibility analysis will consider border-town receivers such as Sumas and Blaine as well as municipalities more distant from the border.

Purpose/Objectives

In order to meet current and future supply needs throughout WRIA 1 it is highly likely that it may be necessary to transfer water from one area to another. This could apply to a number of scenarios such as:

- Taking water from an existing source of supply and area(s) of use and moving all or part of it to another location
- Taking water from a new source of supply either within or outside of WRIA 1 and moving it to a location within WRIA 1 (e.g., British Columbia, Skagit River System, deep aquifer)

There are a number of local and state requirements that affect the ability to successfully transfer water. Examples of such requirements include:

- Ecology water right considerations (e.g., place of use, point of withdrawal, time of year, etc.)
- Washington State Department of Health considerations (e.g., plans described in water system plans)
- Local policies, regulations, other considerations (e.g., growth management and comprehensive plans, the Coordinated Water System Plan, SEPA, contracts, etc.)
- Other economic, legal, political, environmental considerations (e.g., Endangered Species Act, Clean Water Act, etc.)

There is not a document that describes the requirements, including the constraints placed on transfers. Providing a clear description of the requirements and constraints will enable decision-makers to have a more realistic picture of the opportunities possible through transfers to meet current and future instream and out-of-stream needs. It would also enable them to determine if changes may be needed to current requirements.

Note: The document is intended to cover the major requirements/constraints and include references for where to go for additional information because it will not be possible to cover all situations.

The purpose of this recommendation is to summarize the requirements and constraints associated with water transfers so that they can be considered as efforts are made to meet current and future water supply needs.

Issues Addressed

Issues that may be addressed by this recommendation include:

- Maximizing available water supplies for consumptive needs
- Supplementing existing supplies with new sources
- Increasing potential for greater certainty for water users
- Supplementing water supplies needed for instream resource needs
- Increasing potential to improve fish habitat resulting from increased stream flows

Information Goals

The action will help provide a better understanding among decision-makers and project participants regarding the feasibility of meeting current and future supply needs via water transfers. Information gained through the comprehensive review will also be used to update the WRIA 1 Management Options Catalog.

Performance Goals

Successful completion of this action will result in a written report describing:

- The requirements associated with water transfers
- Constraints that may exist
- References regarding where to go for additional information

Implementation Plans/General Schedule

WRIA 1 Project staff will conduct the work associated with this recommendation with assistance from local, state, and tribal participants and others as necessary. A report summarizing the review findings will be submitted to WRIA 1 participants upon completion at which point they may want recommend actions to address potential constraints identified.

Budget/Resource Requirements

The estimate for resource requirements is limited to completing the review, and preparing the report.

Staff Resources:

1. WRIA 1 Project Staff - 0.125 FTE (assumes approximately 30 hours per month for 9 months)
2. Report copying and distribution will be the responsibility of the WRIA 1 Joint Board.

Roles and Responsibilities of Implementing Parties

WRIA 1 Project Staff – WRIA 1 Project Staff will complete the review and write the report. Relevant local, state, tribal, and other entities will provide information as requested by WRIA 1 Project Staff.

Monitoring and Adaptive Management

Not applicable.

Relationship to Other Programs

As noted previously, transferring water from one area to another requires compliance with a number of difference programs, policies, and requirements. Examples include the Coordinated Water System Plan, Growth Management/Comprehensive Plans, Water System Plans, contracts, Ecology water rights permitting, and tribal considerations. This project will not change any of these requirements but may highlight areas where changes will be recommended in the future.

The recommended WRIA 1 Watershed Management Plan programs that will need to be considered and/or coordinated with this recommendation are as follows: Water Use Efficiency, Instream Flow Selection and Adoption Action Plan, Comprehensive Irrigation District Management Plan, Water Use Tracking, and Water Rights Information Assistance Center.

WRIA-Wide Program

Water Use Tracking Program

Program Name- WRIA 1 Water Use Tracking Program

Background – The Washington State Department of Ecology (Ecology) has approximately 8,000 state water right records for WRIA 1. These include water right applications for new water, applications for changes to existing water rights, water right permits, water right certificates, and water right claims, with the latter accounting for approximately 4,800 records. The current backlog of pending state water rights is approximately 1,000, with about 930 being new applications and the remainder being for changes to existing water rights. A significant number of these applications are for existing uses, many of which have existed for 10 years or more.

Under current laws and regulations, many areas in WRIA 1 are closed to new water rights and instream flows are established on the major streams and tributaries. The instream flows constitute state water rights with priority dates of 1986 so that subsequent rights are not allowed to impair those flows and are, therefore, subject to curtailment to protect those instream flows, some of which are frequently not attained. These restrictions, coupled with a number of court decisions over the last few years, result in the fact that most of the existing backlog of pending applications would be denied if Ecology were to process them today.

In evaluating water right applications, Ecology must address four statutory tests: Is the proposed use a beneficial use as defined by statute? Is water physically available for the proposed use? Can the water use be approved without impairment of any existing water rights (including state, federal, and Tribal water rights)? And, is the proposed water use not detrimental to the public welfare? If Ecology can answer all of these questions in the affirmative, a state water right permit is issued.

In answering the water availability and water right impairment questions, Ecology needs to identify all legal water uses in the area that could be impaired by the issuance of a permit. Ecology attempts to compare the available supply with the current demand for water. If water right totals are used, the results can be misleading. Ecology prefers to use actual water use data because the result is more reliable. This task is complicated by the fact that federal and Tribal water rights, that generally have senior priority dates, have not yet been quantified in WRIA 1.

Under long-standing principles of Washington water law, the measure of a water right is the quantity applied to beneficial use, under the terms and conditions of a water right. In fact, a

state water right is only created upon the actual application of water to beneficial use. The quantity of water continually applied to beneficial use is the basis for quantification of the right. In the case of so-called vested rights (for uses that existed prior to the surface water code of 1917 or the ground water code of 1945), the measure of such rights is also based on the quantity of water historically applied to beneficial use. Claims for rights that were created prior to the permit system are subject to the water code and require evidence that the right was legally created under the common law or statutory notice requirements, and perfected by the beneficial use of water. The law also states that waters not put to beneficial use may be relinquished back to the state, generally after five or more consecutive years of nonuse. This is described in Chapter 90.14 RCW.

Because the measure of the water right is the quantity of water put to beneficial use, the paper water right record is not an accurate indication of the quantity of water actually being used in WRIA 1 for a number of reasons including: .

1. Some water right holders may no longer be using their water right at all or may only be using part of the water quantity listed on their water right and may not, in fact, have the legal right to any unused water;
2. Some users may be using more than that to which they are legally entitled;
3. Some users may be using water without a legal water right to do so;
4. Some legal uses, such as those from wells that are exempt from permitting under Chapter 90.44 RCW, are using water in quantities not to exceed 5,000 gallons per day but, without water use data, there is no way of knowing how much they are actually using. In many cases, their actual use is probably closer to 1,000 gallons per day given that a typical residence is generally assumed to use about 800 gallons per day on peak use days.

In order to effectively manage the water resources of WRIA 1 and for Ecology to be able to make decisions on pending water right applications, Ecology must determine whether water is available for the new appropriation. In order to do so, Ecology needs the best possible estimate of actual water use. Accurate information about water use and water rights is essential to the effective management of the resource and is a critical component required for any future water market in which willing buyers and sellers can buy and sell water rights. It is also critical for real estate transactions that occur absent a water market. Without this information, the seller cannot be certain what they are selling and the buyer cannot be certain about what they are buying. The result of this lack of certainty is artificial prices that do not

reflect the true value of the water right and may, in fact, prevent the transaction from occurring at all.

Under Washington water law, the adjudication process is the sole means of determining the existence, amount, and priorities of existing rights. There are members of the WRIA 1 Staff Team that believe it is highly likely that a general adjudication of water rights will be conducted in WRIA 1 in the future. It is believed that this will be necessary for the following reasons:

First, there is a need for certainty about water use and rights in order to effectively manage the water resources in WRIA 1 in the face of continued growth and development. This certainty is necessary for a number of reasons, including the effective operation of a water marketing system and for ensuring that property buyers and sellers have an accurate understanding of the nature and extent of any water rights attached to properties which are being bought and sold. Because of the high value that water brings to a parcel of land, it is critical that both buyers and sellers have the same understanding and that there is a basis in law for that understanding.

Second, tribal efforts to quantify tribal claims to water, including treaty-based rights to instream flows related to salmon in WRIA 1, may result in the establishment of a senior water right for this purpose and for the purpose of the reservation(s). Under the principle of first in time is first in right embodied in water law, this could result in some form of regulation of all other water rights which will be junior to the tribal rights. In order to regulate water users to protect the rights of more senior water right holders, Ecology would need to understand the rights of all water users in the watershed. This would include a determination of which of the nearly 5,000 water right claims in WRIA 1 represent a valid vested water right and which do not. This can only be determined through water rights adjudication.

A related issue is that under current legal practices water users with no water right documents are generally excluded from the adjudication process and in WRIA 1, the WRIA 1 Agricultural Caucus has estimated that 60 percent of their members do not have water rights for their existing agricultural operations. This has led to an agreement by WRIA 1 participants that unpermitted water users need to have a meaningful way to participate in efforts to negotiate a settlement of water rights conflicts. One way this will happen under this proposal is that unpermitted water users will be invited to the table for the local drainage scale flow negotiations described in the WRIA 1 Instream Flow Action Plan (Appendix A). Ways will be sought for the unpermitted users, in exchange for taking immediate actions to help flows and salmon habitat, to continue participation through the adjudication process. Agreements supporting their participation will be one outcome of the local flow negotiation

process described in ISF Selection and Adoption Action Plan (ISF Action Plan). If this process is successful, local support will be available for any required legislative changes.

Members of the WRIA 1 Staff Team believe it is in the best interests of all residents of WRIA 1 to begin now to develop certainty regarding water use to begin the transition to an era of improved water management and to be prepared should an adjudication emerge from either the tribal efforts to quantify and establish a water right for fishery and reservation purposes or from the need for certainty regarding water rights.

Purpose- The purpose of the WRIA 1 Water Use Tracking Program is to establish a local framework and process that empowers participants of the WRIA 1 Project to solve problems associated with administration of water rights, current water rights enforcement policy, setting and meeting instream flows, and to prepare for the potential of a general adjudication of water rights in WRIA 1. The Water Use Tracking Program is intended to achieve the following goals within 10 years of its implementation:

- Have a management system that is capable of processing typical water right applications and changes within a reasonable time frame, with a target of an average of 90 days.
- Have a system to track and monitor water use
- Have the data available to support the proposed management option of a market for water rights should one be developed (refer to WRIA 1 Other Recommendation – Review of Water Banking and Water Marketing as a Water Resource Management Tool).
- Have cleaned up the existing records and clarify use (i.e., who has what) to facilitate, among other things, property transactions that accurately reflect the water rights associated with those properties.
- Have improved flows, salmon habitat and other environmental values through agreements built on trust, positive actions, an open process, and predictable outcomes.
- Have prepared for a general adjudication of water rights in the coming years, including seeking legislative changes to the existing adjudication process and other agreed to legislative changes to better reflect the needs of WRIA 1 as they are defined.

Location- WRIA-wide

Issue- There are information/data gaps in the existing databases in WRIA 1 making it difficult to understand the extent of all of the issues related to water quantity and water quality

in the basin. This lack of understanding contributes to the challenges of resolving water use management issues in WRIA 1 including inefficiency in processing water right applications and changes, enforcement and/or compliance actions, and managing stream flows for instream and out of stream uses. As a result, there is a need in WRIA 1 to collectively develop and reach agreements on the local policies that will help WRIA 1 water users manage water in a manner that is both beneficial and efficient.

A management option addressing a water rights market as a management tool has been proposed as part of this WRIA 1 Watershed Management Plan. To expect to have a functional market for water rights requires having a functional tracking system that can provide assurance to the market that what is being bought and sold is valid. This will ultimately require cleaning up the current documents and subjecting rights being used to review.

Design Information The WRIA 1 Water Use Tracking Program is designed around the basic premise that, collectively, the WRIA 1 population will use water in ways that ensure there will always be enough water available to meet daily needs. To accomplish this, policies will need to be developed that 1) direct monitoring and reporting of water use, water quantity, and water quality on an individual use basis; 2) create a fee structure that supports management of the data collection, compliance needs, and enforcement procedures; and 3) create and implement agreements related to solutions for maintaining water supplies and instream flows in the form of agreements negotiated in the framework of the local instream flow negotiations leading to Federal/Tribal/State settlement of claims and a general stream adjudication.

To achieve the intended program goals listed in the purpose statement, the WRIA 1 Water Use Tracking Program was designed around four distinct elements: 1) Water Use Registration and Reporting; 2) a WRIA 1 Water Committee³; 3) a WRIA 1 water master, and 4) agreements negotiated during implementation of the ISF Action Plan. Each of the elements is described below along with their specific objectives.

Element 1 – Water Use Registration and Reporting

Purpose:

The purpose of Water Use Registration and Reporting as part of the WRIA 1 Water Use Tracking Program is to continue building a database that provides reliable information on water use for making crucial water resource management decisions and to provide data for water users to document the extent of their beneficial use in an adjudication. Currently, the

³ The term “water committee” is a place holder for a representative process that includes entities identified in the WRIA 1 Implementation Strategy (Section 4 of the WRIA 1 Phase 1 Watershed Management Plan). Element 2 of the Water Use Tracking proposal further discusses the “water committee” composition and responsibilities.

database is not adequate to provide information on how much, where, when, and for what purpose water is being used. Obtaining additional data on water use is essential to achieving both the short and long term goals of the WRIA 1 Water Use Tracking Program. Collecting fees as part of the registration and reporting element is critical to funding implementation of the WRIA 1 Water Use Tracking Program and its success.

Objectives and related tasks to achieve objectives:

1. Implement a water use registration system that requires the registration of the source of water for each parcel. The source could include claims, permits, certificates, applications, exempt wells, and /or public or private water systems. Implement as part of the water use registration system a fee and annual reporting of water use. (This fee should be distributed equitably through the basin including exempt wells and the unpermitted users. It is recognized that there may need to be enabling legislation for fees.) This collection of an annual water registration fee will fund data analysis, a complaint forum regarding agreements and water use, education, and enforcement.

Task 1: Implement a water user fee that applies to anyone with a parcel that uses water. This water use fee would be collected along with the property tax payment for the water user and would include a fixed fee per parcel (or per ownership) (<\$10) and a volume fee with a minimum covering the first 100 acre-feet and a small fee (<\$0.25) per acre-foot above that based on metered use or claimed annual capacity as indicated on their water use documents. Exempt wells and residential users would only be charged a fixed fee per parcel. The revenues collected through this process would go to the Whatcom County treasury and would be earmarked for use on activities related to the implementation of the WRIA 1 Water Use Tracking Program, including funding this data collection and analysis.

Task 2: Based on the registration and reporting, the WRIA 1 Project Implementation Team will provide an annual report to the local WRIA 1 planning process regarding estimated monthly water use and the amount of revenue generated for implementation of the program. After the first five years, the water use reporting requirements will require incorporation of actual use data rather than estimated use.

Task 3: Water users that are required to have water rights but are without valid claims, permits, or certificates will be expected to file applications within two years of the beginning of reporting. This will assure the planning process of good data on future water use needs.

Task 4: Based on reporting of water use, the WRIA 1 Working Group will make recommendations to the WRIA 1 participants for changes to the water rights enforcement and management elements of the plan. The WRIA 1 planning process may, in turn, make recommendations to Ecology or other appropriate governments or agencies related to water rights enforcement and management elements of the plan.

2. To use the registration system to help clean up the existing records and make possible the possibility of a functional market for water rights the following steps will be taken.

Task 1: Compile and analyze the data from the mandatory registration process for holders of water right, certificates, claims, and permits. This will identify possible non-reporters and will help in the identification of water right claims, permits, and certificates that are no longer in use.

Task 2: The first year of the registration process the “Water Committee” and water master will work together to increase public understanding of the adopted WRIA 1 Watershed Management Plan, the water resource-related issues in WRIA 1, and the Water Use Tracking program including the water registration system.

Task 3: At the end of the second year of the registration system, the water master will begin comparing registered paperwork against Ecology’s files of claims, certificates, and permits. Completing this task will result in identification of the non-registered water users. The identified non-registered water users will be contacted by the water master and, if they are using water on their property, will be encouraged to register. The claims, permits, and certificates for which no current water use can be identified will be assumed eligible for relinquishment and will be provided to Ecology for potential relinquishment pursuant to the existing laws related to relinquishment. (Note: this process provides several opportunities for due process and the relinquishment order is an action that can be appealed by the holder of the water right that is being relinquished)

Task 4: The permits and certificates that are not identified with a water use will be processed through the relinquishment process by Ecology. This will go a long ways toward cleaning up the records for the administration of water rights.

Task 5: At the end of the fourth year of initiating the registration system, registered users are reminded that the requirement for water use reporting changes from estimated use to actual use in year five.

Task 6: During this time, local negotiations to select and adopt instream flows will be under way. These negotiations, which may occur in the framework of an adjudication, may lead to agreements that will provide water users in a drainage certainty until a general

adjudication for the entire WRIA 1 has been completed, in exchange for increased flows and habitat improvements. Local negotiations may also include agreements to begin an adjudication process for existing claims, certificates, and permits. It is anticipated that the participating affected parties will have agreed to a way for unpermitted users to meaningfully participate in efforts to negotiate recommended flows.

In a water rights adjudication, all those claiming a right to use water from a specific water source are joined in a single action to determine the rights and priorities for the use of water from that source. Claims for existing rights are analyzed as to their current validity and state water rights limited to the extent they are beneficially using water. An adjudication cannot lessen, enlarge, or modify existing water rights. The action is only to confirm the validity and extent of existing rights already established under state law and/or federal law. In contrast as part of a negotiated settlement, new uses or rights could possibly be granted if agreed to by the parties.

Task 7: The expectation is that by year 10 of the Water Use Tracking Program's initiation, all existing water rights will have been adjudicated and all unpermitted users will have applied for a state water right or have secured water rights through a water marketing system. Ultimately, all water uses need to be adjudicated for the reasons stated above. However, due to the complexities of the legal process this could take five to ten years to complete. The purpose of agreements negotiated as part of ISF Action Plan implementation is to achieve habitat improvements and provide certainty for water uses (both instream and out of stream) in the short-term at the drainage scale. This will enhance local cooperation and provide improvements in the situation for all water uses while a WRIA 1 wide resolution of water issues and a Federal/Tribal/ State settlement agreement is finalized.

Element 2 - WRIA 1 Water Committee

Purpose:

The Water Committee is a committee of the Water Resource Management Assembly⁴ whose efforts are facilitated through the involvement of the WRIA 1 Working Group and the Project Implementation Team. The WRIA 1 Working Group will continue to participate in the Water Use Tracking Program in a manner consistent with their role in the WRIA 1 process, which is to formulate recommendations for consideration by the WRIA 1 Joint Board and the full Water Resource Management Assembly. The Project Implementation Team will perform the administrative functions associated with the Water Use Tracking Program and will support

⁴ Refer to Section 4 of this WRIA 1 Watershed Management Plan for a description of the Water Resource Management Assembly, the Project Implementation Team, and the WRIA 1 Working Group.

the efforts of the Water Committee. The overall purpose of a broad-based Water Committee is to oversee mediation of problems with agreements with water users that may result following the ISF Action Plan negotiation. It will further serve as the focal point for recommendations from interest groups for future water-law and process reforms, which in turn, will be forwarded as recommendations to the appropriate entities with the authority to make the recommended changes. For example, recommended changes to Ecology rules or policy could be forwarded to Ecology for action. Recommended changes to statutes could be forwarded to the Legislature for their consideration. Recommended changes to local ordinances would be forwarded to the County or any other appropriate local governments.

Objectives and related tasks to achieve objectives:

1. Establish a local WRIA 1 Water Committee of interested members of the Water Resource Management Assembly with support from the Project Implementation Team and WRIA 1 Working Group. This cooperative Water Committee structure can provide a public forum and focal point for complaints about water users, review reports from contractors to understand what works, and make recommendations to the WRIA 1 planning process for changes to the Water Use Tracking program and management elements of the WRIA 1 Watershed Management Plan.

Task 1: WRIA 1 participants form a Water Committee to draft, recommend, and pursue the administrative actions needed to achieve the goals of the WRIA 1 Water Use Tracking Program. If necessary the committee should draft, recommend, and pursue the legislation necessary to empower the WRIA 1 planning process with establishing the desired approach.

Element 3 - WRIA 1 Water Master

Purpose:

The initial purpose of a local water master for WRIA 1 is to increase public understanding of the adopted WRIA 1 Watershed Management Plan, the water resource-related issues in WRIA 1, and the Water Use Tracking Program including the water registration system and may act as Ecology's agent in local flow negotiations, while providing technical assistance to water users on water code compliance. In the future, the water master will become a key player for enforcement of the water code. As stated above, the water master would be created as allowed under existing state law unless changes to existing statutes are successfully pursued.

Objectives and related tasks to achieve objectives:

1. Establish a water master pursuant to RCW 90.03.060-100. This water master will be appointed by Ecology in consultation with the Water Committee (see Element 2 above). Traditionally, a water master is appointed to regulate water use according to existing water rights. In this case, while this is a part of the duties, the water master may also play a significant role in the ISF Action Plan implementation and in public education about water resources. To the extent this is deemed consistent with the existing statutes; statutory changes may not be required. Such details could be embodied in a legal document such as a Memorandum of Agreement between Ecology and one or more governments. To the extent such actions are deemed inconsistent with the existing statute, changes to the statute could be pursued by the WRIA 1 planning effort. As details are developed about the preferred role of a water master, Ecology and the Washington State Office of the Attorney General will be asked whether they believe this proposal would require changes to the statutes as they relate to the duties of a water master.

Task 1: WRIA 1 participants would recommend that a water master be appointed by Ecology. Duties of the WRIA 1 water master will be consistent with those in Chapter 90.03.070 and will be detailed in a Memorandum of Agreement between Ecology and the appropriate governments. If necessary, modifications to the statutes could be pursued and, if enacted, could be incorporated into this approach. Enforcement powers of the WRIA 1 water master will be similar to those in Chapter 90.03.090 with any modifications defined as part of any recommended legislation.

Task 2: Ecology appoints a WRIA 1 water master and a Memorandum of Agreement between Ecology and the appropriate governments would be initiated.

Element 4 - Agreements Negotiated During ISF Action Plan Implementation for Immediate Improvements in Instream Flows, Fish Habitat and Conservation

Purpose:

The purpose of negotiated agreements coming out of the ISF Action Plan implementation is to make immediate improvements to instream flow, water quality, conservation, reuse, fish habitat, and efficient use of water at the drainage level pending finalization of the basin wide effort.

Water users with well-documented beneficial use under the terms of a permit, certificate, claim, or exempt well may elect not to enter into agreements during the flow negotiations. However, these users will still benefit by the registration program, which includes the collection and reporting of water use data as a means of supporting the confirmation of their water rights in an adjudication.

Objectives and related tasks to achieve objectives:

- The drainage level agreements from the ISF Action Plan implementation will be between affected parties. They will allow a water user to use water in a particular way, in accord with environmental or other conditions as specified in the agreement. These terms and conditions will be negotiated and agreed upon by all parties participating in the local flow negotiations.

Task 1: The WRIA 1 water master may participate in ISF Action Plan implementation. The details of the resulting interim agreements will be subject to review in a public meeting once the terms and conditions are decided. The purpose of this meeting is to provide the public with an opportunity to learn about these agreements and what they contain. If a property owner who has an agreement sells his/her property during the term the agreement is transferred to the new owner (i.e., runs with the land).

Performance Goals

- 90% of water users reporting estimated water use within two (2) years of initiating the water registration program and 99.9% within 5 years.
- After the beginning of actual use reporting, achieve 90% reporting of actual use within three (3) years and 98% within seven (7) years.
- Adjudication of water rights commences when local negotiations decide but in all cases should be completed by year 15.

Implementation Plans/General Schedule

Task	Schedule	Lead	Resource Needs
Define WRIA 1 Water Committee composition	January 2005	PUD/Joint Board	Budget Request/In kind
Recommend administrative and/or legislative actions	TBD	Water Committee	Budget Request
Appoint Water Master	TBD	Water Committee	Budget Request
Initiate Water Use Fee	TBD	Water Master	Budget Request
Initiate Flow Negotiations	September 2004	Instream Flow Working Group	Budget Request

Budget/Resource Requirements

Budget Estimates

- Define WRIA 1 Water Committee – PUD/Instream Flow Working Group In kind
- WRIA 1 Water Master Position -
- Administrative Support Per Year for WRIA 1 Policy Program -
- Data Collection and Reporting – Funded through a Water Use Fee of \$10 per user plus \$0.25 per acre-foot of claimed annual capacity per water right documents.

Roles and Responsibilities of Implementing Parties

Public Utility District No. 1 of Whatcom County (PUD) – The PUD will take the lead, on behalf of the Joint Board, to define a WRIA 1 Water Committee, which is assumed to be composed of interested and available members of the Water Resource Management Assembly. Once the WRIA 1 Project Implementation Team is in place (WRIA 1 Implementation Structure, Section 4) and is self-supporting, the PUD will defer responsibility of implementing this task to that Team. If a structure is not in place by January 2005 for implementing the WRIA 1 Watershed Management Plan, the PUD will provide an oversight role for purposes of implementing the WRIA 1 Water Use Tracking Program with the primary role of implementation being the responsibility of the WRIA 1 water master and WRIA 1 Water Committee.

Monitoring and Adaptive Management

Performance Monitoring Approach

- Water Use Fee Implemented by December 2005
- Annual reporting through the Water Committee to include:
 - Negotiated agreement activity per calendar year,
 - Total annual use by basin
 - Percentage of claimed water users with negotiated agreements
 - Percentage of actual water use being reported and incorporated into WRIA 1 water use database

- Revenues generated by the program
- Expansion of WRIA 1 databases with information collected by water users as part of their water contract including but not limited to data related to water quality, instream flows, and habitat.

Adaptive Management Approach

The WRIA 1 Water Committee and WRIA 1 water master will identify milestones at which they will evaluate the approach for implementing the WRIA 1 Water Use Tracking Program and make recommendations for changes to the WRIA 1 Water Resource Management Assembly. The likely factors that will influence program implementation are recommendations for and outcomes of state legislative actions, progress of creating Watershed Improvement Districts (WID) in drainages such as Bertrand and Tenmile, and collection of funds through a water user fee. The program will follow the adaptive management protocol established in the WRIA 1 March 2000 Scope of Work Section 2.7.

Relationship to Other Programs

Comprehensive Irrigation District Management Plan/Watershed Improvement District (CIDMP/WID) – Efforts are underway to create a WID in the Bertrand and Tenmile watersheds. As proposed, the WIDs have technical and policy goals consistent with the overall WRIA 1 project goals. The formation of a WRIA 1 Water Committee and the efforts of the WRIA 1 water master will need to take into consideration the progress of the WIDs as the Water Committee and water master proceed with meeting the objectives of the WRIA 1 Water Use Tracking Program. The WIDs and the implementers of the WRIA 1 Water Use Tracking program will mutually support each other's program goals including the joint data collection needs and, in particular, creating and populating a water use database. The WRIA 1 water master will also focus initial efforts for creating voluntary water contracts in the Bertrand and Tenmile watersheds in an effort to support the WIDs.

Water Conservancy Board – In 1997, through Chapter 90.80 RCW, the Washington State Legislature authorized creation of local conservancy boards to assist the Washington State Department of Ecology (Ecology) with the backlog of water right change applications. Ecology then undertook rulemaking relative to the formation and operation of conservancy boards and in November 1999, Chapter 173-153 WAC was adopted. Amendments to both the statute and the rule were made in 2001. A conservancy board is authorized to change or transfer water rights that have been perfected and are documented by a state issued water right certificate or permit. The authority is limited to that granted within RCW 90.03.380, 90.03.390, and 90.44.100. In Whatcom County, the Whatcom Conservancy Board was

established in December 1999. The WRIA 1 Water Use Tracking Program does not duplicate or conflict with the activities or authorities of the existing Whatcom Conservancy Board. Rather, it is anticipated that the Water Use Tracking Program will increase exposure of the Whatcom Conservancy Board and its authorities to individuals with applications for water right transfers.

WRIA 1 Instream Flow Selection and Adoption Action Plan (ISF Action Plan)– The local drainage scale flow negotiations anticipated under the ISF Action Plan are the forum from which agreements with water users for immediate flow and habitat improvements will come. Further the triggering of possible local and ultimate general stream adjudications will be determined during the local flow negotiations. This makes a significant link between the ISF Action Plan and this program.

MARCH 25, 2005

WRIA 1 WATERSHED MANAGEMENT PLAN-PHASE 1

APPENDIX A – WATERSHED MANAGEMENT PROJECT STRUCTURE AND FUNCTION

APPENDIX B – MARCH 2000 SCOPE OF WORK

APPENDIX C – WRIA 1 INSTREAM FLOW SELECTION AND ADOPTION PLAN,
VERSION 6C

APPENDIX D – REPORT AND STUDY REFERENCE GUIDE

APPENDIX E – CRITERIA FOR EVALUATION OF PILOT PROGRAMS

APPENDIX F – PROGRAMS AND RECOMMENDATIONS FOR FUTURE
CONSIDERATION

**APPENDIX G – WRIA 1 WATERSHED
MANAGEMENT PLAN APPROVALS**

RESOLUTION NO. 505

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF PUBLIC UTILITY DISTRICT NO. 1 OF WHATCOM COUNTY ("DISTRICT") AUTHORIZING APPROVAL OF THE WRIA 1 WATERSHED MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW 90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and the District decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Nation and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060 and by interlocal agreement formed the Joint Board as a decision making body; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, the WRIA 1 watershed planning process was initiated in 1998 and has continued until the present time; and

WHEREAS, the WRIA 1 watershed planning process conducted pursuant to Chapter 90.82 RCW has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, the Joint Board met on March 18, 2005 and by consensus recommended the WMP to the respective Initiating Government councils and commissions for approval; and

WHEREAS, the Planning Unit met on March 23, 2005 and by consensus recommended the WMP to the respective Initiating Government councils and commissions for approval;

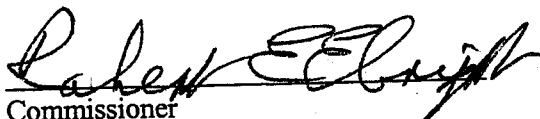
NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of Public Utility District No.1 of Whatcom County that the Watershed Management Plan - Phase 1 be approved and furthermore recommends that the councils or commissions of Whatcom County, City of Bellingham, Lummi Nation and Nooksack Tribe approve the WMP.

ADOPTED by the Commission of Public Utility District No. 1 of Whatcom County at its regular meeting held on the 26 day April, 2005.

**PUBLIC UTILITY DISTRICT NO.1
Of WHATCOM COUNTY**


President/Commissioner


Secretary/Commissioner


Commissioner



LUMMI INDIAN BUSINESS COUNCIL

2616 KWINA ROAD • BELLINGHAM, WASHINGTON 98226 • (360) 384-1489

NOT
CERTIFIED

RESOLUTION # 2005 - 074 OF THE LUMMI INDIAN BUSINESS COUNCIL

TITLE: Authority to Approve the WRIA 1 Watershed Management Plan – Phase 1

WHEREAS, the Lummi Indian Business Council is the duly constituted governing body of the Lummi Indian Reservation by the authority of the Constitution and By-laws of the Lummi Nation of the Lummi Reservation, Washington; and

WHEREAS, the Council is responsible for the protection, restoration, enhancement, and management of the natural resources within the exterior boundaries of the Lummi Reservation and throughout the Usual and Accustomed Fishing and Gathering Grounds and Stations; and

WHEREAS, the State of Washington passed legislation in 1998 known as the Watershed Planning Act (RCW 90.82) which created a framework for local watershed planning; and

WHEREAS, the Lummi Nation is a separate distinct sovereign and state law does not apply, but the Nation chose to accept an invitation to participate in the local watershed planning process; and

WHEREAS, the Lummi Indian Business Council passed Resolution 98-63 to authorize the Lummi Natural Resources Department to participate in the WRIA 1 Watershed Management Project pursuant to the terms of a Memorandum of Agreement and this participation has occurred since October 1998; and

WHEREAS, the WRIA 1 Watershed Management Project – Phase 1 is a step toward the eventual adoption of a watershed management plan that may resolve conflicts over our federal reserved water rights; and

WHEREAS, the WRIA 1 Watershed Management Project – Phase 1 is limited to identifying a “road map” for selecting and adopting instream flows, continuing data collection and monitoring, completing technical studies, and developing the next version of the watershed management plan; and

WHEREAS, approval of the plan means to approve the 2005 and 2006 activities including the implementation of the Instream Flow Selection and Adoption Action Plan and does not mean the approval of technical work that is still being conducted or any recommendations or plans that might be generated by the activities conducted during implementation of the Phase I plan; and

WHEREAS, the plan does not allocate water resources or estimate tribal treaty rights to water; and

WHEREAS, no estimate of tribal treaty rights are binding on the Lummi Nation unless the

Lummi Nation expressly agrees in writing and such agreement is approved in writing by the United States; and

WHEREAS, the Lummi Natural Resources Department technical and policy staff have had a substantial role in the design and implementation of the WRIA 1 Watershed Management Project technical studies and the development of the WRIA 1 Watershed Management Plan – Phase 1; and

WHEREAS, the Lummi Fisheries and Natural Resources Commission passed a motion during their April 6, 2005 meeting that recommends that the Lummi Indian Business Council approve the WRIA 1 Watershed Management Plan – Phase 1 and its implementation.

NOW THEREFORE BE IT RESOLVED, that the Chairman (or Vice Chairman in his absence) is hereby authorized to formally approve the March 25, 2005 version of the WRIA 1 Watershed Management Plan – Phase 1 if there are no substantive changes; and

BE IT FURTHER RESOLVED, that the Lummi Natural Resources Department Executive Director (or designee in his absence) is hereby authorized to enter into interlocal agreements as recommended by the Lummi Nation Water Team to implement the instream flow selection and adoption action plan; and

BE IT FINALLY RESOLVED, that the Chairman (or Vice Chairman in his absence) is hereby authorized and directed to execute this resolution and any documents connected therewith, and the Secretary (or the Recording Secretary in his absence) is authorized and directed to execute the following certification.

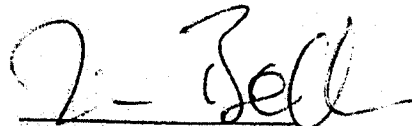
LUMMI NATION



Darrell Hillaire, Chairman
Lummi Indian Business Council

CERTIFICATION

As Secretary of the Lummi Indian Business Council, I hereby certify that the above Resolution #2005-074 was adopted at a Special Meeting of the Council held on the 25th of April, 2005, at which time a quorum of 10 was present by a vote of 9 For, 0 Against, and 0 Abstentions(s).



Timothy Ballew Sr, Secretary
Lummi Indian Business Council

RESOLUTION NO. 710

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LYNDEN,
WASHINGTON, CONDITIONALLY ENDORSING THE WRIA NO 1
WATERSHED MANAGEMENT PLAN – PHASE 1**

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning", to develop a *"...more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development."* (RCW 90.82.005); and

WHEREAS, per RCW 90.82.010: *"...the local development of watershed plans is intended to serve 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 the resources."*; and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, the City of Lynden ("City") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a WRIA, which WAC 173-500 establishes; and

WHEREAS, in 1998, per RCW 90.82.060, the WRIA No 1 initiating governments established a planning unit, which included a Small Cities Caucus, and of which City is a member; and

WHEREAS, the initiating governments decided that, in addition to the RCW 90.82.060(6) required Water Quantity element, the WRIA No 1 plan would include all RCW 90.82.060(6) optional components, e.g., Instream Flow, Water Quality and Habitat; and

WHEREAS, the WRIA No 1 watershed planning process has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW 90.82.070 through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP does not yet satisfy all RCW-required elements, and consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA No 1, including instream flows; and

WHEREAS, City understands that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of City, but rather the WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides a legal framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, some members of the initiating governments and/or planning unit might seek substantial new and additional ongoing funding requirements to further pursue the elements of the WMP, which presently remains incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the City Council and are fully incorporated into the following resolution as a material part thereof;

NOW THEREFORE, BE IT RESOLVED:

Section 1. The City Council authorizes the Mayor, on behalf of City, to support approval of the proposed WMP at the Small Cities Caucus and the planning unit; **PROVIDED THAT**, any such support for approval is contingent upon, and subject to, the conditions, reservations and exceptions set forth in Section 2 below.

Section 2. The City Council declares that its approval of the proposed WMP is contingent upon, and subject to, the following conditions, reservations and exceptions; and is further contingent and based upon City's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

A. The WMP does not meet the statutory requirements for all plan components, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).

B. The WMP has not undergone legal review by City's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by City.

C. The WMP will not be binding in any future litigation or administrative proceeding involving City, including those under RCW 90.82.130. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.

D. The Instream Flow Selection and Adoption Plan, (included in Appendix C of the WMP and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.

E. The City and Department of Ecology have signed a Memorandum of Agreement ("MOA") which provides a framework for achieving a long term solution to the City's water right issues and for resolution of differences. The City will continue to work under the MOA toward achievement of its purposes without limitation from the WMP or any process developed pursuant to the WMP. Finally, under no circumstances shall the WMP impair, limit, or interfere with any and all opportunities for the City to resolve its short or long range water right issues outside and independent from any process identified in the WMP or developed pursuant to the WMP.

F. City believes that any new County-wide sources of funding developed to support implementation of activities identified in the WMP, or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.

G. City understands that planning unit staff will fully incorporate this Resolution into the WMP.

H. City is obliged to represent the interests of its taxpayers as well as those persons who have purchased property within City's water service area. City will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The City Council hereby declares that it would have passed this resolution and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

PASSED BY the City Council of the City of Lynden, Washington and signed by the

Mayor on this 2nd day of May, 2005.



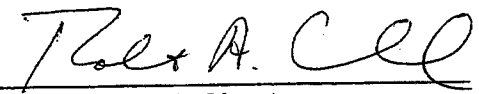
Jack Louws/Mayor

ATTEST:



Bill Verwolf, City Clerk

APPROVED AS TO FORM:



Bob Carmichael, City Attorney

RESOLUTION NO. 1390-05

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BLAINE,
WASHINGTON, CONDITIONALLY ENDORSING THE WRIA NO 1 WATERSHED
MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning", to develop a: "...more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development." (RCW 90.82.005); and

WHEREAS, per 90.82.010: "...the local development of watershed plans is intended to serve 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 the resources."; and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, the City of Blaine ("City") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a WRIA, which WAC 173-500 establishes; and

WHEREAS, in 1998, per RCW 90.82.060, the WRIA No 1 initiating governments established a planning unit, which included a Small Cities Caucus, and which City is a member; and

WHEREAS, the initiating governments decided that, in addition to the RCW 90.82.060(6) required Water Quantity element, the WRIA No 1 plan would include all RCW 90.82.060(6) optional components, i.e., Instream Flow, Water Quality and Habitat; and

WHEREAS, the WRIA No 1 watershed planning process has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW 90.82.070 through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP does not yet satisfy all RCW-required elements, and consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA No 1, including instream flows; and

WHEREAS, City understands that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of City, but rather the WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides a legal framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, some members of the initiating governments and/or planning unit might seek substantial new and additional ongoing funding requirements to further pursue the elements of the WMP, which presently remains incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the City Council and are fully incorporated into the following resolution as a material part thereof;

THEREFORE, BE IT RESOLVED:

Section 1. The City Council authorizes the City Manager, on behalf of City, to support approval of the proposed WMP at the Small Cities Caucus and the planning unit; PROVIDED THAT, any such support for approval is contingent upon, and subject to, the conditions, reservations and exceptions set forth in Section 2 below.

Section 2. The City Council declares that its approval of the proposed WMP is contingent upon, and subject to, the following conditions, reservations and exceptions; and is further contingent and based upon City's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

A. The WMP does not meet the statutory requirements for all plan components, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).

B. The WMP has not undergone legal review by City's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by City.

C. The WMP will not be binding in any future litigation or administrative proceeding involving City, including those under RCW 90.82.130. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.

D. The Instream Flow Selection and Adoption Plan, (included in Appendix C of the WMP and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.

E. Implementation of new or existing groundwater withdrawals to augment streamflows, as contemplated in the pilot project Groundwater Augmentation of Streamflows, (cited in Section 3 of the WMP document) will require proponents to demonstrate non-impairment of any and all senior rights, including without limitation applications, permits, certificates and claims.

F. City believes that any new County-wide sources of funding developed to support implementation of activities identified in the WMP, or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.

G. City understands that planning unit staff will fully incorporate this Resolution into the WMP.

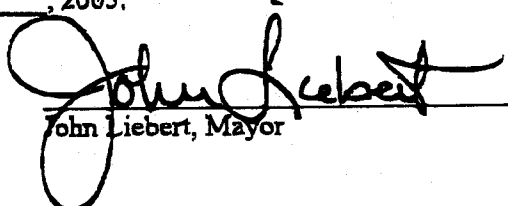
H. City is obliged to represent the interests of its taxpayers as well as those persons who have purchased property within City's water service area. City will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

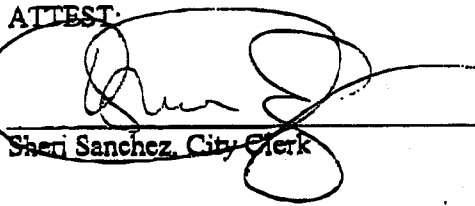
Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

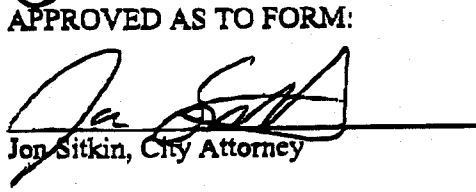
Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The City Council hereby declare that it would have passed this code and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

PASSED BY the City Council of the City of Blaine, Washington and approved by the Mayor on this 14th day of March, 2005.


John Liebert, Mayor

ATTEST:

Sheri Sanchez, City Clerk

APPROVED AS TO FORM:

Jon Sitkin, City Attorney



POINT ROBERTS WATER DISTRICT NO. 4

79 Tyee Drive, Suite A, Point Roberts, WA 98281
Tel: (360) 945-4696 Fax: (360) 945-3021

POINT ROBERTS WATER DISTRICT NO. 4
79 TYEE DRIVE, SUITE A
POINT ROBERTS, WA 98281

RESOLUTION 571

A RESOLUTION OF THE BOARD OF COMMISSISONERS OF POINT ROBERTS WATER DISTRICT NO. 4, WHATCOM COUNTY, WASHINGTON, AUTHORIZING QUALIFIED AND CONDITIONAL APPROVAL OF THE WATERSHED MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of the watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, the Point Roberts Water District No. 4 ("District") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a Water Resource Inventory Area ("WRIA"), as such areas are established in chapter 173-500 WAC; and

WHEREAS, most of Whatcom County lies within WRIA 1; and

WHEREAS, a portion of Whatcom County lies within WRIA 3; and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and Whatcom County PUD #1 decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Tribe and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, RCW 90.82.060 further assigns the Initiating Governments the task of organizing a planning unit ("Planning Unit"); and

WHEREAS, in 1998 the Initiating Governments organized a Planning Unit and provided the representation of water districts in the WRIA 1 watershed planning process by establishing a Water Districts Caucus as a member of said Planning Unit; and

WHEREAS, Point Roberts Water District No. 4 is a member of the Water Districts Caucus; and

WHEREAS, the WRIA 1 watershed planning process was initiated in 1998 and has continued until the present time; and

WHEREAS, the WRIA 1 watershed planning process conducted pursuant to Chapter 90.82 RCW has produced a document entitled Watershed Management Plan – Phase 1 ("WMP"); and

WHEREAS, the Planning Unit is currently considering approval of the proposed WMP; and

WHEREAS, Chapter 90.82 RCW establishes that the scope of the watershed planning under the Act must include a Water Quantity element (RCW 90.82.070) and may include elements for Water Quality (RCW 90.82.090), Habitat (RCW 90.82.100) and Instream Flow (RCW 90.82.080) as optional elements of a watershed management plan; and

WHEREAS, the Initiating Governments decided that in addition to the mandatory Water Quantity element, the proposed WMP would include all optional components identified in the statute, to wit: Instream Flow, Water Quality and Habitat. This decision was later approved by the Planning Unit; and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW.90.82.070) through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP is incomplete and does not meet the statutory requirements of Chapter 90.82 RCW for watershed management plan components; and

WHEREAS, a consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA 1, including without limitation instream flows; and

WHEREAS, it is the understanding of the District that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of the District; and

WHEREAS, the proposed WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides an adjudicatory framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, notwithstanding approval of the proposed WMP, future litigation of many if not most water right related issues in WRIA 1 remains a strong possibility; and

WHEREAS, substantial new and additional ongoing funding requirements may be sought by some members of the Initiating Governments and/or Planning Unit to further pursue the elements of the WRIA 1 Watershed Management Plan Phase 1, which presently remain incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the Board of Commissioners and are fully incorporated into the following resolution as a material part thereof;

NOW THEREFORE IT IS HEREBY RESOLVED THAT:

Section 1. The District's General Manager is authorized on behalf of the District to support approval of the proposed WMP document as the Water Districts Caucus and the Planning Unit; provided that, any such support for approval shall be contingent upon and subject to the conditions, reservations and exceptions set forth in Section 2 hereof.

Section 2. By adoption of this Resolution the Board of Commissioners declares that any approval by the District of the proposed WMP shall be contingent upon and subject to the following conditions, reservations and exceptions; and shall be further contingent and based upon the District's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

- A. The WMP document will not meet the statutory requirements for any plan component, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).
- B. The WMP document has not undergone legal review by the District's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by the District.
- C. The WMP document will not be binding in any future litigation or administrative proceeding involving the District. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.
- D. The WMP will not create binding obligations on the District under RCW 90.82.130 or by any other mechanism.
- E. The WRIA 1 Instream Flow Selection and Adoption Plan, Version 6c (included in Appendix C of the WMP document and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.
- F. Implementation of new or existing groundwater withdrawals to augment streamflows, as contemplated in the pilot project Groundwater Augmentation of Streamflows, will require proponents to demonstrate

non-impairment of any and all senior rights, including without limitation applications, permits, certificates and claims. This project is cited in Section 3 of the WMP document.

- G. The preface to the WMP document states that the County expended \$3.8 million in developing this plan. This information was not presented to or specifically approved by the Planning Unit. The accuracy of these figures is not endorsed.
- H. The idea of a single management entity with a dedicated source of funds, cited in Section 4 of the WMP document, is not supported. Any new county-wide sources of funding developed to support implementation of activities identified in the WMP or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.
- I. This Resolution and its limited authorization for conditional approval of the WMP shall be fully incorporated into the WMP.
- J. The District is obliged to represent the interests of its ratepayers as well as those persons who have purchased property within the District's water service area. The District will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of Commissioners hereby declare that it would have passed this code and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

ADOPTED by the Board of Commissioners of the Point Roberts Water District No. 4, Whatcom County, Washington, at a Special Meeting held the 26th day of April, 2005.


N. Madeleine Anderson - Chairman


Arthur Wilkowski - Secretary


Susan M. Johnson - Commissioner

COPY

RESOLUTION NO. 644

A RESOLUTION OF THE BOARD OF COMMISSIONERS
OF BIRCH BAY WATER & SEWER DISTRICT, WHATCOM COUNTY,
WASHINGTON, AUTHORIZING QUALIFIED AND CONDITIONAL APPROVAL
OF THE WATERSHED MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW 90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, the Birch Bay Water & Sewer District ("District") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a Water Resource Inventory Area ("WRIA"), as such areas are established in chapter 173-500 WAC; and

WHEREAS, most of Whatcom County lies within WRIA 1; and

WHEREAS, a portion of Whatcom County lies within WRIA 3; and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and Whatcom County PUD #1 decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Nation and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, RCW 90.82.060 further assigns the Initiating Governments the task of organizing a planning unit ("Planning Unit"); and

WHEREAS, in 1998 the Initiating Governments organized a Planning Unit and provided for representation of water districts in the WRIA 1 watershed planning process by establishing a Water Districts Caucus as a member of said Planning Unit; and

WHEREAS, Birch Bay Water & Sewer District is a member of the Water Districts Caucus; and

WHEREAS, the WRIA 1 watershed planning process was initiated in 1998 and has continued until the present time; and

WHEREAS, the WRIA 1 watershed planning process conducted pursuant to Chapter 90.82 RCW has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, the Planning Unit is currently considering approval of the proposed WMP; and

WHEREAS, Chapter 90.82 RCW establishes that the scope of watershed planning under the Act must include a Water Quantity element (RCW 90.82.070), and may include elements for Water Quality (RCW 90.82.090), Habitat (RCW 90.82.100) and Instream Flow (RCW 90.82.080) as optional elements of a watershed management plan; and

WHEREAS, the Initiating Governments decided that in addition to the mandatory Water Quantity element, the proposed WMP would include all optional components identified in the statute, to wit: Instream Flow, Water Quality and Habitat. This decision was later approved by the Planning Unit; and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW 90.82.070 through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP is incomplete and does not meet the statutory requirements of Chapter 90.82 RCW for watershed management plan components; and

WHEREAS, consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA 1, including without limitation instream flows; and

WHEREAS, it is the understanding of the District that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of the District; and

WHEREAS, the proposed WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides an adjudicatory framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, notwithstanding approval of the proposed WMP, future litigation of many if not most water right related issues in WRIA 1 remains a strong possibility; and

WHEREAS, substantial new and additional ongoing funding requirements may be sought by some members of the Initiating Governments and/or Planning Unit to further pursue the elements of the WRIA 1 Watershed Management Plan Phase I, which presently remain incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the Board of Commissioners and are fully incorporated into the following resolution as a material part thereof;

NOW THEREFORE IT IS HEREBY RESOLVED THAT:

Section 1. The District's General Manager is authorized on behalf of the District to support approval of the proposed WMP document at the Water Districts Caucus and the Planning Unit; provided that, any such support for approval shall be contingent upon and subject to the conditions, reservations and exceptions set forth in Section 2 hereof.

Section 2. By adoption of this Resolution the Board of Commissioners declares that any approval by the District of the proposed WMP shall be contingent upon and subject to the following conditions, reservations and exceptions; and shall be further contingent and based upon the District's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

A. The WMP document will not meet the statutory requirements for any plan component, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).

B. The WMP document has not undergone legal review by the District's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by the District.

- C. The WMP document will not be binding in any future litigation or administrative proceeding involving the District. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.
- D. The WMP document will not create binding obligations on the District under RCW 90.82.130 or by any other mechanism.
- E. The WRIA 1 Instream Flow Selection and Adoption Plan, Version 6c (included in Appendix C of the WMP document and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.
- F. Implementation of new or existing groundwater withdrawals to augment streamflows, as contemplated in the pilot project Groundwater Augmentation of Streamflows, will require proponents to demonstrate non-impairment of any and all senior rights, including without limitation applications, permits, certificates and claims. This project is cited in Section 3 of the WMP document.
- G. The preface to the WMP document states that the County expended \$3.8 million in developing this plan. This information was not presented to or specifically approved by the Planning Unit. The accuracy of these figures is not endorsed.
- H. The idea of a single management entity with a dedicated source of funds, cited in Section 4 of the WMP document, is not supported. Any new county-wide sources of funding developed to support implementation of activities identified in the WMP or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.
- I. This Resolution and its limited authorization for conditional approval of the WMP shall be fully incorporated into the WMP.
- J. The District is obliged to represent the interests of its ratepayers as well as those persons who have purchased property within the District's water service area. The District will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

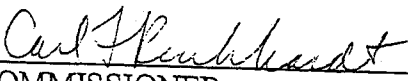
Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of Commissioners hereby declare that it would have passed this code and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

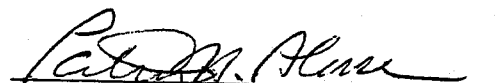
ADOPTED by the Board of Commissioners of the Birch Bay Water & Sewer District, Whatcom County, Washington, at a regular meeting held the 10th day of March, 2005.


COMMISSIONER


COMMISSIONER


COMMISSIONER

THIS IS TO CERTIFY that the above is a true and correct copy of Resolution No. 644 of Birch Bay Water & Sewer District, Whatcom County, Washington, adopted at the regular meeting of the Board of Commissioners on March 10, 2005.


SECRETARY

LAKE WHATCOM WATER AND SEWER DISTRICT

RESOLUTION NO. 701

A Resolution of the Board of Commissioners
of Lake Whatcom Water & Sewer District, Whatcom County,
Washington, Authorizing Qualified and Conditional Approval of the Watershed Management
Plan – Phase 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW 90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, Lake Whatcom Water & Sewer District ("District") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a Water Resource Inventory Area ("WRIA"), as such areas are established in chapter 173-500 WAC; and

WHEREAS, most of Whatcom County lies within WRIA 1; and

WHEREAS, a portion of Whatcom County lies within WRIA 3; and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and Whatcom County PUD #1 decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Tribe and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, RCW 90.82.060 further assigns the Initiating Governments the task of organizing a planning unit ("Planning Unit"); and

WHEREAS, in 1998 the Initiating Governments organized a Planning Unit and provided for representation of water districts in the WRIA 1 watershed planning process by establishing a Water Districts Caucus as a member of said Planning Unit; and

WHEREAS, Lake Whatcom Water & Sewer District is a member of the Water Districts Caucus; and

WHEREAS, the WRIA 1 watershed planning process was initiated in 1998 and has continued until the present time; and

WHEREAS, the WRIA 1 watershed planning process conducted pursuant to Chapter 90.82 RCW has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, the Planning Unit is currently considering approval of the proposed WMP; and

WHEREAS, Chapter 90.82 RCW establishes that the scope of watershed planning under the Act must include a Water Quantity element (RCW 90.82.070), and may include elements for Water Quality (RCW 90.82.090), Habitat (RCW 90.82.100) and Instream Flow (RCW 90.82.080) as optional elements of a watershed management plan; and

WHEREAS, the Initiating Governments decided that in addition to the mandatory Water Quantity element, the proposed WMP would include all optional components identified in the statute, to wit: Instream Flow, Water Quality and Habitat. This decision was later approved by the Planning Unit; and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW 90.82.070 through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP is incomplete and does not meet the statutory requirements of Chapter 90.82 RCW for watershed management plan components; and

WHEREAS, consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA 1, including without limitation instream flows; and

WHEREAS, it is the understanding of the District that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of the District; and

WHEREAS, the proposed WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides an adjudicator framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, notwithstanding approval of the proposed WMP, future litigation of many if not most water right related issues in WRIA 1 remains a strong possibility; and

WHEREAS, substantial new and additional ongoing funding requirements may be sought by some members of the Initiating Governments and/or Planning Unit to further pursue the elements of the WRIA 1 Watershed Management Plan Phase I, which presently remain incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the Board of Commissioners and are fully incorporated into the following resolution as a material part thereof;

NOW, THEREFORE, BE IT RESOLVED THAT:

Section 1. The District's General Manager is authorized on behalf of the District to support approval of the proposed WMP document at the Water Districts Caucus and the Planning Unit; provided that, any such support for approval shall be contingent upon and subject to the conditions, reservations and exceptions set forth in Section 2 hereof.

Section 2. By adoption of this Resolution the Board of Commissioners declares that any approval by the District of the proposed WMP shall be contingent upon and subject to the following conditions, reservations and exceptions; and shall be further contingent and based upon the District's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

- A. The WMP document will not meet the statutory requirements for any plan component, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).
- B. The WMP document has not undergone legal review by the District's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by the District.
- C. The WMP document will not be binding in any future litigation or administrative proceeding involving the District. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.
- D. The WMP document will not create binding obligations on the District under RCW 90.82.130 or by any other mechanism.
- E. The WRIA 1 Instream Flow Selection and Adoption Plan, Version 6c (included in Appendix C of the WMP document and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.
- F. Implementation of new or existing groundwater withdrawals to augment streamflows, as contemplated in the pilot project Groundwater Augmentation of Streamflows, will

require proponents to demonstrate non-impairment of any and all senior rights, including without limitation applications, permits, certificates and claims. This project is cited in Section 3 of the WMP document.

G. The preface to the WMP document states that the County expended \$3.8 million in developing this plan. This information was not presented to or specifically approved by the Planning Unit. The accuracy of these figures is not endorsed.

H. The idea of a single management entity with a dedicated source of funds, cited in Section 4 of the WMP document, is not supported. Any new county-wide sources of funding developed to support implementation of activities identified in the WMP or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.

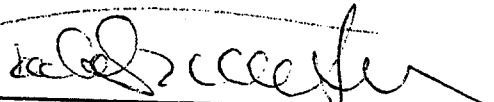
I. This Resolution and its limited authorization for conditional approval of the WMP shall be fully incorporated into the WMP.

J. The District is obliged to represent the interests of its ratepayers as well as those persons who have purchased property within the District's water service area. The District will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

Section 4. This Resolution shall be effective immediately.

ADOPTED by the Board of Commissioners of Lake Whatcom Water and Sewer District, Whatcom County, Washington, at a Regular Meeting thereof, on the 9th day of March, 2005.

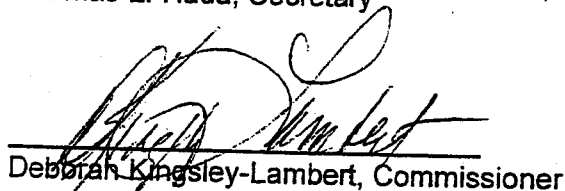


Todd Citron, President

Thomas L. Hadd, Secretary



Blair Ford, Commissioner



Deborah Kingsley-Lambert, Commissioner

Commissioner

RESOLUTION NO. 01-05

A RESOLUTION OF THE BOARD OF COMMISSIONERS
OF SAMISH WATER DISTRICT, WHATCOM COUNTY,
WASHINGTON, AUTHORIZING QUALIFIED AND CONDITIONAL APPROVAL
OF THE WATERSHED MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW 90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, the Samish Water District ("District") is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a Water Resource Inventory Area ("WRIA"), as such areas are established in chapter 173-500 WAC; and

WHEREAS, most of Whatcom County lies within WRIA 1; and

WHEREAS, a portion of Whatcom County lies within WRIA 3; and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and Whatcom County PUD #1 decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Tribe and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, the proposed WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides an adjudicatory framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, notwithstanding approval of the proposed WMP, future litigation of many if not most water right related issues in WRIA 1 remains a strong possibility; and

WHEREAS, substantial new and additional ongoing funding requirements may be sought by some members of the Initiating Governments and/or Planning Unit to further pursue the elements of the WRIA 1 Watershed Management Plan Phase I, which presently remain incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the Board of Commissioners and are fully incorporated into the following resolution as a material part thereof;

NOW THEREFORE IT IS HEREBY RESOLVED THAT:

Section 1. The District's Manager is authorized on behalf of the District to support approval of the proposed WMP document at the Water Districts Caucus and the Planning Unit; provided that, any such support for approval shall be contingent upon and subject to the conditions, reservations and exceptions set forth in Section 2 hereof.

Section 2. By adoption of this Resolution the Board of Commissioners declares that any approval by the District of the proposed WMP shall be contingent upon and subject to the following conditions, reservations and exceptions; and shall be further contingent and based upon the District's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

A. The WMP document will not meet the statutory requirements for any plan component, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).

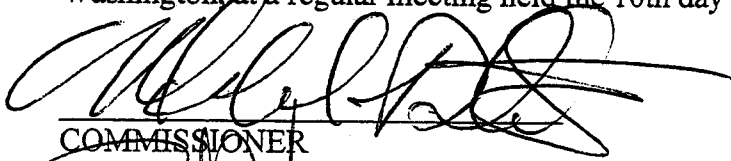
B. The WMP document has not undergone legal review by the District's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by the District.

C. The WMP document will not be binding in any future litigation or administrative proceeding involving the District. Neither the WMP

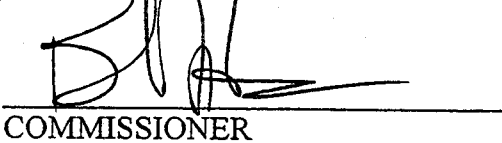
Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of Commissioners hereby declare that it would have passed this code and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

ADOPTED by the Board of Commissioners of Samish Water District, Whatcom County, Washington, at a regular meeting held the 10th day of March 2005.

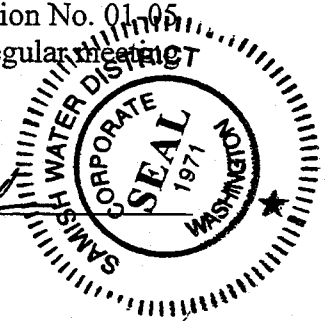

COMMISSIONER

COMMISSIONER


COMMISSIONER

THIS IS TO CERTIFY that the above is a true and correct copy of Resolution No. 01-05 of Samish Water District, Whatcom County, Washington, adopted at the regular meeting of the Board of Commissioners on March 10, 2005.


SECRETARY



RESOLUTION NO. 2005-01

A RESOLUTION OF THE BOARD OF COMMISSIONERS
OF WHATCOM COUNTY WATER DISTRICT #2, WHATCOM COUNTY,
WASHINGTON, AUTHORIZING QUALIFIED AND CONDITIONAL APPROVAL
OF THE WATERSHED MANAGEMENT PLAN - PHASE 1

WHEREAS, in 1997 the Washington State Legislature adopted Chapter 90.82 RCW, entitled "Watershed Planning;" and

WHEREAS, the stated purpose of watershed planning is to develop a more thorough and cooperative method of determining the current water resource situation in each Water Resource Inventory Area ("WRIA") and to provide local citizens with the maximum possible input concerning their goals and objectives for water resource management and development (RCW 90.82.005); and

WHEREAS, the local development of watershed plans is intended to serve 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 the resources (RCW 90.82.010); and

WHEREAS, the legislature found that it is necessary for units of local government to engage in the orderly development of watershed plans (RCW 90.82.010); and

WHEREAS, Whatcom County Water District #2 (District) is one such unit of local government; and

WHEREAS, RCW 90.82.060 specifies procedures for initiation of watershed planning within a Water Resource Inventory Area ("WRIA"), as such areas are established in chapter 173-500 WAC; and

WHEREAS, most of Whatcom County lies within WRIA 1; and

WHEREAS, a portion of Whatcom County lies within WRIA 3; and

WHEREAS, pursuant to RCW 90.82.060, Whatcom County, the City of Bellingham and Whatcom County PUD #1 decided jointly and unanimously to proceed with watershed planning in WRIA 1 and invited, as further provided under RCW 90.82.060, the Lummi Tribe and Nooksack Tribe to participate; and

WHEREAS, the five above-named entities together are regarded as the initiating governments ("Initiating Governments") as defined in RCW 90.82.060; and

WHEREAS, RCW 90.82.060 assigns the Initiating Governments the task of determining the scope of the planning to be conducted within the WRIA; and

WHEREAS, RCW 90.82.060 further assigns the Initiating Governments the task of organizing a planning unit ("Planning Unit"); and

WHEREAS, in 1998 the Initiating Governments organized a Planning Unit and provided for representation of water districts in the WRIA 1 watershed planning process by establishing a Water Districts Caucus as a member of said Planning Unit; and

WHEREAS, Whatcom County Water District #2 is a member of the Water Districts Caucus; and

WHEREAS, the WRIA 1 watershed planning process was initiated in 1998 and has continued until the present time; and

WHEREAS, the WRIA 1 watershed planning process conducted pursuant to Chapter 90.82 RCW has produced a document entitled Watershed Management Plan - Phase 1 ("WMP"); and

WHEREAS, the Planning Unit is currently considering approval of the proposed WMP; and

WHEREAS, Chapter 90.82 RCW establishes that the scope of watershed planning under the Act must include a Water Quantity element (RCW 90.82.070), and may include elements for Water Quality (RCW 90.82.090), Habitat (RCW 90.82.100) and Instream Flow (RCW 90.82.080) as optional elements of a watershed management plan; and

WHEREAS, the Initiating Governments decided that in addition to the mandatory Water Quantity element, the proposed WMP would include all optional components identified in the statute, to wit: Instream Flow, Water Quality and Habitat. This decision was later approved by the Planning Unit; and

WHEREAS, Chapter 90.82 RCW mandates that detailed requirements must be satisfied and that specific information shall be included in the Water Quantity, Water Quality, Habitat and Instream Flow components of a watershed management plan (RCW 90.82.070 through 90.82.100); and

WHEREAS, these statutory components of a watershed management plan (Water Quantity, Water Quality, Habitat and Instream Flow) are interrelated; and

WHEREAS, the proposed WMP is incomplete and does not meet the statutory requirements of Chapter 90.82 RCW for watershed management plan components; and

WHEREAS, consensus has not been reached on certain matters logically precedent to completion of a final watershed management plan for WRIA 1, including without limitation instream flows; and

WHEREAS, it is the understanding of the District that neither the proposed WMP, nor any portion thereof, gives rise to any legal obligation on the part of the District; and

WHEREAS, the proposed WMP represents a potential non-binding road map, subject to change, for undertaking additional work related to Water Quantity, Water Quality, Instream Flows and Habitat; and

WHEREAS, state law provides an adjudicatory framework and process for obtaining certainty and finality in determination of disputes concerning water rights and other related legal issues; and

WHEREAS, notwithstanding approval of the proposed WMP, future litigation of many if not most water right related issues in WRIA 1 remains a strong possibility; and

WHEREAS, substantial new and additional ongoing funding requirements may be sought by some members of the Initiating Governments and/or Planning Unit to further pursue the elements of the WRIA 1 Watershed Management Plan Phase I, which presently remain incomplete; and

WHEREAS, all of the foregoing recitals are legislative findings of the Board of Commissioners and are fully incorporated into the following resolution as a material part thereof;

NOW THEREFORE IT IS HEREBY RESOLVED THAT:

Section 1. The District's Commission President is authorized on behalf of the District to support approval of the proposed WMP document at the Water Districts Caucus and the Planning Unit; provided that, any such support for approval shall be contingent upon and subject to the conditions, reservations and exceptions set forth in Section 2 hereof.

Section 2. By adoption of this Resolution the Board of Commissioners declares that any approval by the District of the proposed WMP shall be contingent upon and subject to the following conditions, reservations and exceptions; and shall be further contingent and based upon the District's understanding that the below conditions, reservations and exceptions are an accurate statement of circumstances under which the WMP is adopted.

A. The WMP document will not meet the statutory requirements for any plan component, including RCW 90.82.070 (Water Quantity), RCW 90.82.080 (Instream Flow), RCW 90.82.090 (Water Quality), and RCW 90.82.100 (Habitat).

B. The WMP document has not undergone legal review by the District's legal counsel. Statements in the WMP document concerning any laws, court decisions, or legal principles associated with water law or water rights are not agreed upon or consented to by the District.

C. The WMP document will not be binding in any future litigation or administrative proceeding involving the District. Neither the WMP document nor statements in the WMP document shall be admissible in evidence in any future judicial, quasi-judicial, or rule-making proceeding.

D. The WMP document will not create binding obligations on the District under RCW 90.82.130 or by any other mechanism.

E. The WRIA 1 Instream Flow Selection and Adoption Plan, Version 6c (included in Appendix C of the WMP document and headed "DRAFT SUBJECT TO LEGAL REVIEW") is acknowledged only as a general point of departure for negotiations and does not and cannot represent a prescriptive formula for decision-making.

F. Implementation of new or existing groundwater withdrawals to augment streamflows, as contemplated in the pilot project Groundwater Augmentation of Streamflows, will require proponents to demonstrate non-impairment of any and all senior rights, including without limitation applications, permits, certificates and claims. This project is cited in Section 3 of the WMP document.

G. The preface to the WMP document states that the County expended \$3.8 million in developing this plan. This information was not presented to or specifically approved by the Planning Unit. The accuracy of these figures is not endorsed.

H. The idea of a single management entity with a dedicated source of funds, cited in Section 4 of the WMP document, is not supported. Any new county-wide sources of funding developed to support implementation of activities identified in the WMP or other watershed management activities in Whatcom County, must be shared equitably with all the County's local governments having watershed management responsibilities.

I. This Resolution and its limited authorization for conditional approval of the WMP shall be fully incorporated into the WMP.

J. The District is obliged to represent the interests of its ratepayers as well as those persons who have purchased property within the District's water service area. The District will continue to take reasonable steps to secure water supplies to serve such properties when they are ready to develop in the future.

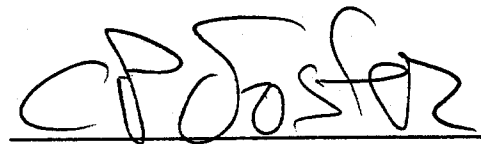
Section 3. BE IT FURTHER RESOLVED that any resolutions or parts of resolutions in conflict herewith are hereby repealed insofar as they conflict with the provisions of this resolution.

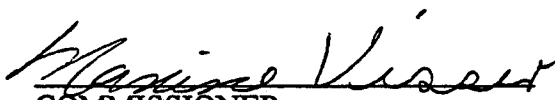
Section 4. If any section, subsection, sentence, clause or phrase of this Resolution is for any reason held to be invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of Commissioners hereby declare that it would have passed this code and each section, subsection, sentence, clause and phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases has been declared invalid or unconstitutional, and if, for any reason, this Resolution should be declared invalid or unconstitutional, then the original Resolution or Resolutions shall be in full force and effect.

Section 5. This Resolution shall be effective immediately.

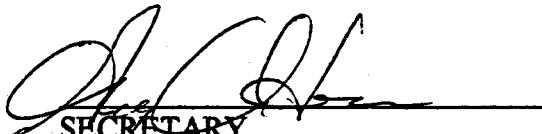
ADOPTED by the Board of Commissioners of Whatcom County Water District #2, Whatcom County, Washington, at a regular meeting held the 22 day of February, 2005.


COMMISSIONER


COMMISSIONER


COMMISSIONER

THIS IS TO CERTIFY that the above is a true and correct copy of Resolution No. 2005-01 of Whatcom County Water District #2, Whatcom County, Washington, adopted at the regular meeting of the Board of Commissioners on 22 February, 2005.


SECRETARY

To: WRIA Staff & Planning Unit Facilitators
From: Land Development Caucus
Date: May 5, 2005
Re: Land Development Caucus Appendix G Reservation Language

Dear WRIA Staff and Planning Unit Facilitators:

Below, please find the Land Development Caucus Reservation Language to be Placed in Appendix G:

The Land Development Caucus does not endorse the provision for “finding a dedicated funding source for the implementation of the plan,” in 2007, following the phrase “necessary to support it,” as stated in Line 66 etseq. in Chapter 4 of the December 2004 draft of the WRIA Plan. We would only support any funding measures after Planning Unit discussion at the proper time (probably on a case-by-case basis), through the Planning Unit process. We also would need to know the exact purpose for requested funding, and how much funding would be allocated for the given funding requests.

From: "Henry Bierlink" <wcagpres@verizon.net>
To: "Mary Dumas" <mary@dumasassoc.com>, "Sue Blake" <sblake@co.whatcom.wa.us>
Date: 4/13/05 4:39PM
Subject: Appendix G addition

"By approving the Watershed Management Plan the Ag Preservation Committee believes we are moving closer to a rational natural resource management strategy. We expect that responsible water use and timely drainage will soon result from implementation of this plan. Responsible resource management requires respect for the land managers. We expect to be allowed to steward the land and water resources entrusted to us without imposing regulations that do not respect our knowledge or abilities. Conversely, we expect to be held accountable for mismanagement. We firmly believe that we can provide quality habitat for fish and upland wildlife and do so without negatively affecting our need to make wise use of the land and water resources available to us."

Henry Bierlink
Whatcom Ag Preservation
1796 Front Street
Lynden, WA 98264
HYPERLINK "mailto:wcagpres@verizon.net"wcagpres@verizon.net
360-354-1337

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No virus found in this outgoing message.
Checked by AVG Anti-Virus.
Version: 7.0.308 / Virus Database: 266.9.8 - Release Date: 4/13/2005

Diking and Drainage Districts Caucus Appendix G Language

The Diking/Drainage caucus is committed to the implementation of the Watershed Plan. The following statements reflect our belief of what will result from implementing the Plan. Our members will be active partners in developing wise water management practices that meet our needs as well of the needs of others in our community."

Programmatic permitting (i.e. British Columbia model @ [HYPERLINK](#) "<http://www.agf.gov.bc.ca/resmgmt/publist/500series/543100-0.pdf>" and <http://www.agf.gov.bc.ca/resmgmt/publist/500series/543100-0.pdf>) must be provided for a multi-year time frame so that timely maintenance of stream channels, dikes/levees, and ditches may be performed in an environmentally correct fashion. This is necessary for effective planting and harvesting of ag crops.

Dike and levee repairs must be completed prior to May 1 so as to minimize environmental damage while providing for adequate time for repairs to stabilize prior to the next flood season.

Gravel removal and bar scalping on the Nooksack River, as historically performed, must be part of a comprehensive management plan. Rising channel beds result in losses of flow, as well as levee overtopping.

Drainage ditches must be maintained in a clean and open condition so farmland will continue to be productive and allow manure to decompose aerobically resulting in reduced pollution.

Ditch and stream bank buffers must be carefully designed so as to enhance channel maintenance in an environmentally sensitive manner.

RESOLUTION NO. 2005-23

A Resolution of the City of Bellingham Authorizing Approval of the WRIA 1 Watershed Management Plan – Phase 1

WHEREAS, the State of Washington passed legislation in 1998 known as the Watershed Planning Act (RCW 90.82) which created a framework for local watershed planning; and

WHEREAS, the City of Bellingham passed Resolution 18-98 to authorize the City's designation as an Initiating Government and the participation of City representatives in the WRIA 1 Watershed Management Project pursuant to the terms of a Memorandum of Agreement and this participation has occurred since October 1998; and

WHEREAS, the City of Bellingham's technical and policy staff have had a continuing role in the design and implementation of the WRIA 1 Watershed Management Project technical studies and the development of the WRIA 1 Watershed Management Plan – Phase 1; and

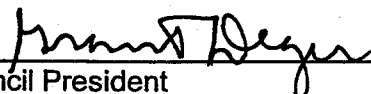
WHEREAS, the WRIA 1 Watershed Management Project – Phase 1 is a step toward the eventual adoption of a watershed management plan that addresses and may resolve water issues important to the City; and

WHEREAS, the WRIA 1 Watershed Management Project – Phase 1 is limited to identifying a "road map" for selecting and adopting instream flows, continuing data collection and monitoring, completing technical studies, and developing the next version of the watershed management plan; and

WHEREAS, the plan does not allocate water resources, or change water rights;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM that the Mayor is hereby authorized to approve the March 25, 2005 version of the WRIA 1 Watershed Management Plan – Phase 1 and to execute any documents connected therewith.

PASSED by the Council this 9TH day of MAY, 2005.



Council President

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-676-6903

APPROVED by me this 17th day of May, 2005.

Mark Asund
Mayor

ATTEST: Christine Wenberg
Finance Director

APPROVED AS TO FORM:

Jean Hoisington
Office of the City Attorney

RESOLUTION WIRA (2)

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-676-6903



**NOOKSACK TRIBAL COUNCIL
RESOLUTION #05- 34
May 6, 2005**

Title: Approve the WRIA 1 Watershed Management Plan

WHEREAS the Nooksack Tribal Council is the governing body of the Nooksack Tribe of Indians in accordance with its Constitution and By-Laws approved by the Deputy Assistant Secretary of Indian Affairs on September 23, 1973, and in accordance with the Indian Reorganization Act of June 18, 1934; and

WHEREAS the Nooksack Tribal Council is charged with the responsibility for the protection of the health, safety, welfare and economic development of the Nooksack Tribe; and

WHEREAS, the Nooksack Tribal Council is responsible for the protection, restoration, enhancement, and management of the natural resources of the Nooksack Indian Tribe; and

WHEREAS, the State of Washington enacted legislation in 1998 which created a framework for local watershed planning, known as the Watershed Planning Act (RCW 90.82); and

WHEREAS, the Nooksack Indian Tribe chose to participate in the local watershed planning process for the Water Resource Inventory Area No. 1 (known as WRIA 1); and

WHEREAS, the WRIA 1 Watershed Management Plan constitutes a step toward the cooperative watershed management that may eventually resolve conflicts over our federal reserved water rights; and

WHEREAS, the WRIA 1 Watershed Management Plan is limited to identifying a "road map" for selecting and adopting instream flows, continuing data collection and monitoring, completing technical studies, and adaptively updating subsequent versions of the watershed management plan; and

WHEREAS, approval of the plan encompasses approving the 2005 and 2006 activities including the implementation of the Instream Flow Selection and Adoption Action Plan and does not imply the approval of technical work that is still being conducted or any recommendations or plans that might be generated by the activities conducted during implementation of the Phase I plan; and

WHEREAS, the plan does not allocate water resources or estimate tribal treaty rights to water; and

WHEREAS, no estimate of tribal treaty rights are binding on the Nooksack Indian Tribe unless the Nooksack Indian Tribe expressly agrees in writing and such agreement is approved in writing by the United States; and

WHEREAS, the Nooksack Natural Resources Department technical and policy staff have had a substantial role in the design and implementation of the WRIA 1 Watershed Management Project technical studies and the development of the WRIA 1 Watershed Management Plan ; and

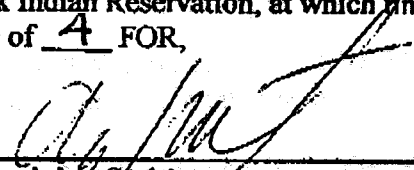
Resolution 05- 34
Page 2 of 2

NOW THEREFORE BE IT RESOLVED, that the Chairman (or Vice Chairman in his absence) is hereby authorized to formally approve the March 25, 2005 version of the WRIA 1 Watershed Management Plan if there are no substantive changes; and

BE IT FURTHER RESOLVED, that the Nooksack Natural Resources Department Director (or designee in his absence) is hereby authorized to enter into interlocal agreements to implement the instream flow selection and adoption action plan;

CERTIFICATION

The above resolution was duly enacted by the Nooksack Tribal Council by a vote of the members held on May 9, 2005 on the Nooksack Indian Reservation, at which time a quorum was polled. The resolution was approved by a vote of 4 FOR, 0 AGAINST, and 0 ABSTENTIONS.



Agripina Smith
Tribal Council Secretary

ATTEST:



Narcisco Cunanan
Tribal Council Chairman



SKAGIT COUNTY
BOARD OF COMMISSIONERS

DON MUNKS, First District
KENNETH A. DAHLSTEDT, Second District
TED W. ANDERSON, Third District

TO: Whatcom County Council
FROM: Board of County Commissioners
SUBJECT: WRIA 1 Watershed Management Plan

The Board of Skagit County Commissioners would like to take this opportunity to congratulate the WRIA 1 planning participants on their approval of the WRIA 1 Watershed Management Plan. We can appreciate the hard work that was necessary to reach this milestone. We understand that the Planning Unit has forwarded the plan to the Whatcom County Council for consideration on June 7th, 2005.

Staff from Skagit County has reviewed this plan and, at this juncture, we consider this plan a notable step forward in addressing water resource issues for the areas of WRIA 1 located within Whatcom County. At this time, the WRIA 1 plan does not require financial or policy input from Skagit County for areas of WRIA 1 that are located within Skagit County. We are confident that, as plan implementation proceeds, staff from our respective counties will continue to coordinate on issues that require input from Skagit County. We also understand that, at the appropriate time, Whatcom County will engage the Skagit County Board of Commissioners on implementation issues that require our approval.

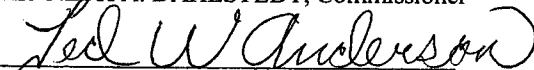
In closing, we want to recognize your efforts these past six years and look forward to working with Whatcom County in the future as we address our regional water resource concerns.

Sincerely,

BOARD OF COUNTY COMMISSIONERS
SKAGIT COUNTY, WASHINGTON


DON MUNKS, Chairman


KENNETH A. DAHLSTEDT, Commissioner


TED W. ANDERSON, Commissioner

SKAGIT COUNTY ADMINISTRATION BUILDING

1800 CONTINENTAL PLACE, MOUNT VERNON, WA 98273

PHONE (360) 336-9300 FAX (360)336-9307

Glossary

Abandonment - The loss of a water right by intended nonuse of water.

Achieving Flow Settings – The process of ensuring that there is sufficient water in streams to satisfy the instream flow requirements adopted by rule-making and other processes.

Adaptive Management – A process whereby management decisions can be changed or adjusted based on additional biological, physical or socioeconomic information.

Adfluvial – Migrating between lakes and rivers or streams; typically used of fish species.

Adjudication – See General Adjudication.

Adjudicated Certificate - A document issued pursuant to RCW 90.03.240 to evidence a water right adjudicated under the terms of an adjudication through a Superior Court.

Administrative Order - A written statement signed by an official of the department who has authority to issue such notices and orders that determines the legal rights, duties, privileges, or other legal interests of a person. Orders are used for a variety of purposes under the water code and may be appealed to the Pollution Control Hearings Board.

Anadromous – Pertaining to fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn, for example, salmon, steelhead trout, and chad.

Applicant - The person requesting a new water right, change to an existing water right; or state funding through a grant and/or loan program.

Application for Change - The standard form, which when completed and filed with Washington State Department of Ecology, is the first step toward changing a water right.

Application for Permit - The standard form which is filed with Washington State Department of Ecology to request that a permit be issued for the use of water, and is the first step toward establishing a water right.

Appropriation of Water - The process of legally acquiring the right to specific amounts of public water through application of the water to beneficial use.

Aquifer - A geologic formation that contains water.

Aquifer Recharge and Recovery - Involves recharge to and recovery of water from an aquifer, that is, both artificial recharge of the aquifer and recovery of the water for subsequent use. Artificial recharge facilities that add to the volume of water within an aquifer, include infiltration basins (spreading basins), infiltration galleries (recharge trenches), vadose zone recharge wells (dry wells), and combination groundwater recharge/recovery wells.

Assignment - Conveying, approved by the department, an application for permit or a water right permit from one person to another.

Base Flow -- Streamflow originating entirely from ground water discharging to the stream. Also used to refer to a level of streamflow established in accordance with provisions of chapter 90.54 RCW required in perennial streams to preserve wildlife, fish, scenic, aesthetic, and other environmental and navigational values. WAC 173-500-050 (3)

Basin - A region in which rainfall or snowmelt water will flow toward a single point. Thus, it is any hollow or trough in the earth's crust, whether filled by water or not. A basin is the total area drained by a river and its tributaries. Used interchangeably with watershed.

Beneficial Use - (1) The use of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, shell fish and other aquatic life, navigation, recreation, thermal power production, preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state, or (2) the measure of a water right based on the amount of water applied in a reasonable manner without waste.

Benthic Invertebrates – Aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water. Examples are clams, crayfish, and a wide variety of worms.

Boldt Phase II -- The decision arising from the court case *United States v. Washington* (1974) which established that the tribal harvest treaty right is for 50% of the harvestable amount of each run of fish returning to tribal usual and accustomed fishing areas. This case included elements regarding habitat which remain to be adjudicated, commonly referred to collectively as “Boldt Phase 2”. As a result of this decision, treaty tribes share co-management authority and responsibility with non-Indian fishery managers. “Boldt” comes from the name of the judge who presided over the case, George Boldt.

Bypass Reach - That section of a stream between the point of diversion and return point which is dewatered when water used nonconsumptively is discharged downstream from the point of diversion.

Certificate - A document issued pursuant to chapters 90.03 or 90.44 RCW to evidence a water right perfected under the terms of the water right permit.

Certificate of change - A document issued pursuant to chapters 90.03 or 90.44 RCW to evidence a change to a water right claim under the terms of an approval by the department.

Channel-Maintenance Flow – (1) The minimum streamflow to sustain biota; (2) range of flows within a stream from normal to peak runoff and may include, but is not limited to, flushing flows or flows required to maintain the existing natural stream channel and adjacent riparian vegetation

Change Authorization - A document issued pursuant to chapters 90.03 or 90.44 RCW to provide a record that a change to an existing water right has been authorized.

Citizen Lawsuits -- A civil suit filed to force the proper implementation of the ESA or to stop the activity of any person, including the United States and any other governmental body or agency that is alleged to be in violation of any part of the ESA or a regulation issued under its authority. Any citizen can file a third party lawsuit regarding ESA implementation. (ESA Section 11)

Clean Water Act -- Growing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act. The Act established the basic structure for regulating discharges of pollutants into the waters of the United States. It gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also continued requirements to set water quality standards for all contaminants in surface waters. The Act made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. It also funded the construction of sewage treatment plants under the construction grants program and recognized the need for planning to address the critical problems posed by non-point source pollution.

Subsequent enactments modified some of the earlier Clean Water Act provisions. Revisions in 1981 streamlined the municipal construction grants process, improving the capabilities of treatment plants built under the program. Changes in 1987 phased out the construction grants program, replacing it with the State Water Pollution Control Revolving Fund, more commonly known as the Clean Water State Revolving Fund. This new funding strategy addressed water quality needs by building on EPA-State partnerships.

Commercial Use - Use of water by a business enterprise.

Comprehensive Cost-Benefit Analysis - The comparison of benefits and costs in management decision-making. Dollar values are assigned to benefits and costs in most cost-benefit analyses.

Consumptive Use - A use of water whereby there is a diminishment in either quantity or quality of the water source.

Coordinated Water System Plan – A plan for public water systems within a critical water supply service area which identifies the present and future water system concerns and sets forth a means for meeting those concerns in the most efficient manner possible.

Critical Area Ordinance (CAO) – In 1990, the Washington State Legislature passed the Growth Management Act, which required counties and cities to designate and protect critical areas. In October of 1997, Whatcom County Council adopted the Critical Area Ordinance, which developed rules to:

- Minimize adverse impacts to the quality and quantity of water resources.
- Protect public from harm due to landslides, erosion, seismic, flooding and other natural hazards.
- Safeguard water quantity and quality.
- Preserve and enhance critical habitat areas necessary to maintain natural ecosystems.

- Protect unique, fragile and valuable elements of the environment, including fish, wildlife and shellfish habitat areas.

Critical Aquifer Recharge Area – Based on the Critical Area Ordinance, Critical Aquifer Recharge Areas are 1) locations of high susceptibility to aquifer contamination due to presence of soil conservation service hydrologic soil groups A or B, and 2) the subsurface above the water table consists of highly permeable materials that are unobstructed by poorly permeable strata.

Cubic Foot Per Second (CFS) - A unit expressing rate of discharge, usually of surface water. One cubic foot per second is equal to the discharge of water having a cross sectional area of one square foot and flowing at an average velocity of one foot per second. One cubic foot per second is equal to 448.8 gallons per minute, 646,317 gallons per day, or 724 acre-feet per year.

Dam - Any artificial barrier and/or any controlling works, together with appurtenant works that can or does impound or divert water.

Decision Support System (DSS) - A series of computer models that will use scientific data to help predict what might happen under different water policies. The DSS will have several components. At its heart will be a database containing information about the quality and quantity of water in WRIA 1, fish habitat, current and projected land uses, and other information. The DSS' other components will help users to access, analyze, and display the information in the database in different ways. For example, there will be a "data visualization" element to show data as maps, charts, and tables; models to help project water use, water quality, and other issues into the future; and an "alternatives builder" that will allow users to test different water policies and project their relative effects.

Demand Forecast - The quantity of water projected to be used within a given geographic area within a specified time for a specific use.

Detailed Management Area (DMA) Within WRIA 1 watershed, three geographic areas (Lynden North, South Fork of the Nooksack, and Tenmile Creek) were identified as DMAs. These areas will have detailed management options developed and evaluated by models due to the areas' significant issues/problems that parallel other areas within WRIA 1 and because these areas have representative economic sectors, and significant data has already been collected, allowing for greater model detail.

Diversion - (1) A physical structure constructed to take surface water from its natural course into a canal, pipe or other conduit by means of gravity flow or by pumping, or (2) the action of taking water from a stream or other body of water.

Domestic Use - The use of water within or at a residence for drinking, cooking, cleaning, sanitation, and maintenance of outdoor amenities associated with the residence.

Drainage – (1) The removal of excess surface water or groundwater from land by means of surface or subsurface drains. (2) Improving the productivity of agricultural land by removing excess water from the soil by such means as ditches or subsurface drainage tiles (pipes). (3) The downward movement of water through the soil. When this occurs rapidly, the soil is referred to as “well drained”; otherwise

poorly drained. Most plant roots need oxygen as well as water, and soil that remains saturated (poorly drained) deprives roots of necessary oxygen. (4) Soil characteristics that affect natural drainage.

Drought Permit - A water right permit issued pursuant to chapter 90.03 RCW in accordance with chapter 43.83B RCW and chapter 173-166 WAC.

Due Diligence - Prudence, activity, or assiduousness, as is properly to be expected from, and ordinarily exercised by a reasonable and prudent person in the prosecution of a water right permit or change authorization.

Easement - A right to use the land of another for conveyance of water.

Ecological Flow Regime - Instream flow levels needed to preserve, protect, and restore the physical, biological, and chemical aspects of a stream can be divided into five functional categories: 1) water quality maintenance, 2) fisheries baseflow, 3) channel maintenance, 4) riparian maintenance, and 5) valley maintenance. Each of these flows components are identified as essential for maintaining the ecological health of the stream system.

Endangered Species Act -- Congress passed the Endangered Species Preservation Act in 1966. This law allowed listing of only native animal species as endangered and provided limited means for the protection of species so listed. The Departments of Interior, Agriculture, and Defense were to seek to protect listed species, and insofar as consistent with their primary purposes, preserve the habitats of such species. Land acquisition for protection of endangered species was also authorized. The Endangered Species Conservation Act of 1969 was passed to provide additional protection to species in danger of "worldwide extinction". Import of such species was prohibited, as was their subsequent sale within the U.S. This Act called for an international ministerial meeting to adopt a convention on the conservation of endangered species.

A 1973 conference in Washington led to the signing of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which restricted international commerce in plant and animal species believed to be actually or potentially harmed by trade.

Later that year, the Endangered Species Act of 1973 was passed, which combined and considerably strengthened the provisions of its predecessors, and broke some new ground.

Its principal provisions follow:

U.S. and foreign species lists were combined, with uniform provisions applied to both [section 4];

Categories of "endangered" and "threatened" were defined [section 3];

Plants and all classes of invertebrates were eligible for protection, as they are under CITES [section 3];

All Federal agencies were required to undertake programs for the conservation of endangered and threatened species, and were prohibited from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its "critical habitat" [section 7];

Broad taking prohibitions were applied to all endangered animal species, which could apply to threatened animals by special regulation [section 9];

Matching Federal funds became available for States with cooperative agreements [section 6];

Authority was provided to acquire land for listed animals and for plants listed under CITES [section 5]; and

U.S. implementation of CITES was provided [section 8].

Significant amendments have been enacted in 1978, 1982, and 1988, while the overall framework of the 1973 Act has remained essentially unchanged. The funding levels in the present Act were authorized through Fiscal Year 1992. Principal amendments are listed below:

1978:

Provisions were added to Section 7, allowing Federal agencies to undertake an action that would jeopardize listed species if the action were exempted by a cabinet-level committee convened for this purpose;

Critical habitat was required to be designated concurrently with the listing of a species, when prudent, and economic and other impacts of designation were required to be considered in deciding on boundaries [section 4];

The Secretaries of Interior and Agriculture (for the Forest Service) were directed to develop a program for conserving fish, wildlife and plants, including listed species, and land acquisition authority was extended to such species [section 5];

The definition of "species" with respect to "populations" was restricted to vertebrates; otherwise, any species, subspecies or variety of plant, or species or subspecies of animal remained listable under the Act [section 3].

1982:

Determinations of the status of species were required to be made solely on the basis of biological and trade information, without any consideration of possible economic or other effects [section 4];

A final rule to determine the status of a species was required to follow within one year of its proposal unless withdrawn for cause [section 4];

Provision was made for designation of experimental populations of listed species that could be subject to different treatment under section 4 , for critical habitat, and section 7 [section 10]; and

A prohibition was inserted against removing listed plants from land under Federal jurisdiction and reducing them to possession [section 9].

1988:

Monitoring of candidate and recovered species was required, with adoption of emergency listing when there is evidence of significant risk [section 4].

Several amendments dealt with recovery matters: 1) recovery plans will undergo public notice and review, and affected Federal agencies must give consideration to those comments; 2) section 4(g) requires five years of monitoring of species that have recovered; and 3) biennial reports are required on the development and implementation of recovery plans and on the status of all species with plans.

A new section 18 requires a report of all reasonably identifiable expenditures on a species-by-species basis be made on the recovery of endangered or threatened species by the States and the Federal government [see last page].

Protection for endangered plants was extended to include destruction on Federal land and other taking when it violates State law [section 9].

Evapotranspiration - The combined loss of water to the atmosphere from land and water surfaces by evaporation and from transpiration, interception, and sublimation.

Extension Request - A written request from a water right permittee or change authorization holder requesting additional time under a development schedule or deadline imposed on a permit.

Federal Reserved Water Right – A category of federal water rights, created by federal law. These rights are created when the federal government withdraws land from the public domain to establish a federal reservation such as a national park, forest, or Indian reservation. By this action, the government is held to have reserved water rights sufficient for the primary purposes for which the land was withdrawn.

Flow, Optimum – That instantaneous discharge which provides the best set of hydraulic conditions for a selected life history stage, species, or fishery. (Bahya 1979)

Fluvial - Of or pertaining to rivers and streams; growing or living in streams or ponds; produced by the action of a river, stream or flood flow, as in a fluvial plain.

Forage Fish - Small fish which breed prolifically and serve as food for predatory fish.

Forfeiture - Statutory loss of water right for non-use of water for five successive years.

Gallons Per Minute - A unit of measurement of the flow of ground water being withdrawn from a well. A flow of one gallon per minute is the amount of water necessary to fill a liquid measure of one gallon each minute the water is flowing.

General Adjudication of Water Rights - A Washington State Superior Court legal proceeding initiated by the department of ecology as plaintiff to determine the validity, priority and extent of existing water rights in a given geographic area or watershed. An adjudication is a form of a quiet title action.

Glacial Outwash Plains - Stratified material, chiefly sand and gravel deposited by meltwater streams in front of the margin of a glacier.

Ground Water - All waters that exists beneath the land surface or beneath the bed of any stream, lake, or reservoir, or other body of surface water within the boundaries of Washington State, whatever may be the geological formation or structure in which such water stands or flows, percolates or otherwise moves.

Ground Water Right - An authorization to withdraw and use ground water for a beneficial purpose established pursuant to chapter 90.44 RCW or under prior existing statutory or common laws of the State of Washington or the United States which has not been abandoned or relinquished.

Group Domestic - The domestic use of water for two or more service connections.

Growth Management Act - In 1990, the Washington State Legislature passed the Growth Management Act, which required counties and cities to adopt comprehensive land use plans and development regulations to coordinate and manage growth and development, as well as protect the State's natural resources and critical areas. After several years of development, study and public input, the Whatcom County Council adopted the *Whatcom County Comprehensive Plan* in May 1997 and the *Whatcom County Critical Areas Ordinance (CAO)*, WCC Chapter 16.16, in October 1997.

Hydraulic Conductivity (effective) - The rate of water flow through a porous medium that contains more than one fluid (such as water and air in the unsaturated zone), which should be specified in terms of both the fluid type and content and the existing pressure.

Hydraulic Continuity - The natural interconnection of ground water and surface water bodies. An aquifer is in hydraulic continuity with wetlands, lakes, streams, rivers or other surface water bodies if it discharges, recharges, or otherwise affects the surface water bodies.

Hydrogeology - The part of geology concerned with the functions of water in modifying the earth, especially by erosion and deposition; geology of ground water, with particular emphasis on the chemistry and movement of water.

Impairment - To adversely impact the physical availability of water for beneficial use for a water right holder so as to prevent the exercise and beneficial use of the water to which such holder is

entitled or to adversely affect the flow of a surface water course at a time when the flows are at or below established instream flows levels.

Impervious Surfaces - A term denoting the resistance to penetration by water or plant roots; incapable of being penetrated by water; non-porous.

Inchoate Water Right - A water right or portion thereof not yet put to beneficial use.

Indigenous Species - Existing, growing, or produced naturally in a region.

Industrial Use - Use of water in any industrial process as a constituent of the process or for related thermal control, washing, drinking, and sanitation. It generally includes commercial water use.

Initiating Governments - There are five Initiating Governments for the WRIA 1 Watershed Management Project. They include City of Bellingham, Lummi Nation, Nooksack Tribe, Public Utility District, and Whatcom County. Each has an Administrative Decision Maker and at least one staff member. The staff members meet on a regular basis to discuss project issues. In January 2000, the Initiating Governments signed an interlocal agreement, creating a Joint Board to handle the project's administrative functions.

Instream - Within the natural stream channel.

Joint Board – In January 2000, the Initiating Governments signed an interlocal agreement, creating a Joint Board to handle administrative functions of the WRIA 1 Watershed Management Project.

Junior Water Right - Any water right established with a priority date subsequent to the right under consideration.

Legal Water Availability - Water that is not only physically available, but which has not been previously appropriated by another person or which is not required to satisfy instream flows (see physical water availability).

Limiting Factors - A condition whose absence or excessive concentration is incompatible with the needs or tolerance of a species or population and which may have a negative influence on their ability to thrive and/or survive. A factor such as temperature, light, water, or a chemical that limits the existence, growth, abundance, or distribution of an organism.

Low Flow - Flow level limitations appearing as provisions on permits and certificates issued by the department or its predecessors.

Lower Aquifer Zone - Any aquifers occurring at a depth below the upper aquifer zone, as determined by the department, or as set forth in the ground water subarea management program for the area, if one exists (see WAC 173-154-040(8)).

Marine Water - The waters of the Pacific Ocean, Strait of Juan de Fuca, Puget Sound, Hood Canal, and bays, inlets, and other waters of the state continuous with these waters at sea level and which are salty or brackish but does not include those surface waters occurring upstream of the mouth of any river or stream.

Maximum Net Benefits - Assessment of the economic, social and environmental costs and benefits of alternative water uses and sources in order to maximize benefits accruing to the people of the state from a water allocation decision. This assessment is applicable to only that quantity of water available over and above the instream flow level.

Minimum Instream Flow - Streamflows established by administrative rule for the purpose of protecting and preserving instream values. Flows adopted by rule are considered a water right with a priority date as of the date of their adoption. Also called "instream flows" and "base flows" in Washington statutes, and generally referred to as "instream flows".

Mitigation - A wide variety of measures (such as siting, facility design, operation, and retrofit) which the department determines are defensible, technically feasible, and environmentally sound that are taken to diminish the impact of an action. It may include, but is not limited to not implementing the decision, taking affirmative steps to avoid the impact, rectifying through restoration or compensating by replacing or providing substitute resources; changes in siting, facility design or operation; retrofitting; transfer or protection of equivalent resources.

Model – A description of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics. Ground water and surface water models are typically a series of mathematical equations that characterize the theorized physical properties of the hydrologic cycle.

Model Calibration and Validation – Calibration refers to the process in which simulated results produced by a model are compared to measured data from a natural system to ensure that the model is estimating what is observed as accurately as possible. Validation of a model is the process in which the calibrated model simulates additional data to compare to data not used in the calibration process.

Model Sensitivity and Uncertainty Analysis – Model sensitivity and uncertainty analyses are conducted to assess if critical assumptions made in the modeling phase can have a predictable effect on the simulated results.

Multiple Aquifer System - Any geologic formation(s) which contains distinct aquifers at different depths that exhibit a significant degree of local or regional hydraulic separation.

Municipal Use - Use of water for multiple purposes associated with urban and suburban water development.

Natural Attenuation - Reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a time frame that is reasonable compared to that offered by other more active methods. The 'natural

attenuation processes' that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater. These in-situ processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants." (EPA, OSWER Directive 9200.4-17P). Thus, the hazardous or waste contamination concentrations can be reduced through natural processes occurring within the ground water.

Naturalized Surface Water Runoff – Naturalized flow is streamflow or runoff that remains after the effects of humans upon the flow is removed.

Net Water Savings - The amount of water determined to be conserved and usable within a specified stream reach for other purposes without impairment or detriment to water rights existing at the time a water conservation project is undertaken, reducing the ability to deliver water, or reducing the supply of water that otherwise would have been available to other existing water uses.

Non-Consumptive - A use of water whereby there is no diminishment in either quantity or quality of the water source. Uses such as hydropower production, which divert the water and return it at the bottom of a bypass reach are considered non-consumptive with respect to the stream below the return point but are consumptive for the bypass reach.

Normal Water Supply - (1) The average amount of water available to a geographical area on an annual basis, based upon an evaluation of precipitation, streamflow, snowpack and other hydrological and meteorological factors, or (2) that amount of water put to beneficial use using reasonably efficient practices, including reasonable conveyance losses, under a valid water right permit or certificate, or a supported registered water right claim.

Perfection - The terms and conditions of a water right permit are satisfied and the amount of water stated in the permit is put to beneficial use

Permeability - (1) The capacity of soil, sediment, or porous rock to transmit water; the property of soil or rock that allows passage of water through it. (2) For a rock or an earth material, the ability to transmit fluids; the rate at which liquids pass through soil or other materials in a specified direction. It is measured by the rate at which a fluid of standard viscosity can move through a material in a given interval of time under a given *Hydraulic Gradient*. Permeability for underground water is sometimes expressed numerically as the number of gallons per day that will flow through a cross section of 1 square foot, at 60EF, under a hydraulic gradient of 100 percent. Permeability is equal to velocity of flow divided by hydraulic gradient. The following permeability terms apply:

- [1] **Very Slow** – less than 0.05 inch per hour;
- [2] **Slow** – 0.05 to 0.20 inch per hour;
- [3] **Moderately Slow** – 0.20 to 0.80 inch per hour;
- [4] **Moderate** – 0.80 to 2.50 inches per hour;
- [5] **Moderately Rapid** – 2.50 to 5.0 inches per hour;
- [6] **Rapid** – 5.0 to 10.0 inches per hour; and
- [7] **Very Rapid** – More than 10.0 inches per hour.

Permit - A document issued by the department pursuant to chapter 90.03 or 90.44 RCW in response to a report of examination that conveys authority to appropriate water and construct physical works associated with the appropriation. To the extent water is not put to use, a permit is an inchoate water right.

Person - Any firm, association, water users' association, public or private corporation, irrigation district, municipal corporation, city, town, Tribe, county, state agency, or the United States of America, as well as an individual.

Physical Water Availability - Water is normally present in the water body or aquifer proposed to be a source of water for appropriation (see also "legal water availability").

Place of Use - The specific portion of a piece of property on which or at which water will be used as specified by a water right permit or certificate. It could be acreage actually irrigated, the site of commercial water use, or the land area to be supplied from a municipal or group domestic water right.

Planning Unit - The Planning Unit operates under a procedural agreement, signed in December 1999, that sets out how the group will function and make decisions. In addition to assisting with the work of the WRIA 1 Watershed Management Project, representatives on the Planning Unit will be responsible for expressing the interests of their constituents.

Point of Diversion/Withdrawal - The place or point on property where water is taken from a surface water source (diversion) or ground water source (withdrawal) to be put to use under a permit, certificate or claimed right.

Preliminary Permit - An authorization issued by the department pursuant to RCW 90.03.290 requiring the applicant to conduct tests or studies for water availability or project viability and/or to collect information to be used by the department to make a decision on an application.

Preservation Flows -- Flow levels designed to "preserve" instream values. This concept is supported by Ch. 90.54.020 RCW which specifies preservation of fish and environmental values. Preservation can be taken to imply safeguarding, for example, a remnant population of fish species – "preservation" as in a "museum piece". Conversely, it can mean preserving conditions at a level that would mimic naturally occurring flows and conditions, i.e. preserve "natural" conditions.

Primary Water Right - The water right relied upon during normal circumstances.

Prior Appropriation Doctrine -- The system for allocating water to private individuals used in most Western states. The doctrine of Prior Appropriation was in common use throughout the arid West as early settlers and miners began to develop the land. The prior appropriation doctrine is based on the concept of "First in Time, First in Right." The first person to take a quantity of water and put it to beneficial use has a higher priority of right than a subsequent user. The rights can be lost through nonuse; they can also be sold or transferred apart from the land.

Priority Date – The date of establishment of a water right. The rights established by application have the application date as the date of priority.

Provision - A condition of a permit or certificate as specified in the report of exam, permit, certificate, or order for that water right.

Public Water Supply - Any water supply intended or used for human consumption or other domestic uses, including source, treatment, storage, transmission and distribution facilities where water is furnished to any community, collection or number of individuals, available to the public for human consumption or domestic use, excluding water supplies serving one single family residence.

Purpose of Use - An attribute of a water right that is descriptive of one or several beneficial water uses noted on a water right application or claim and/or authorized by a water right permit or certificate.

Purveyor - A person who sells or distributes water.

Reasonably Efficient Practices - Those practices including, but not limited to, methods of conveyance, use, and disposal of water which are reasonable and appropriate under the circumstances to bring about water use without waste.

Reasonable and Feasible Pumping Lift - The dynamic elevation range of an aquifer within which a ground water appropriator's pumping lift will be protected against impairment.

Recharge of Ground Water - The processes by which surface water percolates below the rooting zone of soil and reaches the saturated zone in an aquifer.

Reclamation and Reuse - The act or process of reclaiming or converting a resource to another use, as swamp or desert lands to irrigable lands or urban lands.

Reinstatement - Restoring the authority embodied with a document for the development of or use of water which had previously been lost through issuance of an order of the department.

Relinquishment - (1) The process whereby the department gives public notice to any person who may have been entitled to divert or withdraw waters of the state that it appears the water right has been abandoned or forfeited, or (2) the loss of a water right by any person who voluntarily fails, without sufficient cause, to beneficially use all or any part of said right to divert or withdraw for any period of five successive years.

Report of Examination - A document issued by the department pursuant to RCW 90.03.290 which assembles and discloses information on the department's investigation and makes recommendations to issue a permit under specific conditions in response to a water right application.

Reservation - An allocation of water made by administrative rule for a determined future beneficial use.

Reserved Water Rights -- This class of water rights is a judicial creation derived from *Winters v. United States* (207 U.S. 564, 1907) and a subsequent federal case law, which collectively hold that when the federal government withdraws land from general use and reserves it for a specific purpose, the federal government by implication reserves the minimum amount of water unappropriated at the time the land was withdrawn or reserved to accomplish the primary purpose of the reservation. Federal reserved water rights may be claimed when Congress has by statute withdrawn lands from the public domain for a particular federal purpose or where the President has withdrawn lands from the public domain for a particular federal purpose pursuant to congressional authorization. (National Research Council 1992)

Restoration Flows -- Flows needed to restore instream values to some previous level. For example, flows in a river may be depleted due to water allocation. By putting water back in a stream, i.e. by restoring the flow, the presumption is that the increased flow would be a benefit and the stream would eventually, at some future date, be “restored” to its previous level.

Reservoir - A water storage facility formed by an artificial barrier and/or dam.

Reservoir Permit - A document issued by the department pursuant to chapter 90.03 RCW that conveys authority to construct a dam or other impoundment structure for the storage and beneficial use of the stored water.

Return Flows - That portion of diverted or withdrawn water which, through seepage/spills, deep percolation or discharge, returns to the source or to another body of water.

Rotation - The changing of a place of water use by one or more water right holders in response to a water shortage.

Rulemaking – The process whereby Washington State government agencies adopt regulations as part of the Washington Administrative Code (WAC) in order to implement the statutes embodied in the Revised Code of Washington (RCW).

Runoff - The portion of the rain or snowmelt water that runs over the land surface and ultimately reaches streams or other water courses.

Saturated Zone - (1) Generally, filled to capacity; having absorbed all that can be taken up; soaked through with moisture. (2) (Hydrologic) A condition often used in reference to soils in which all voids or pore spaces between soil particles are filled with water. (3) (Chemistry) Describes a solution in its most concentrated

Seasonal Change Authorization - A document issued by the department pursuant to chapter 90.03 RCW in response to a request for a seasonal transfer of a water right or portion thereof that conveys authority to use water.

Section, Township, Range - A geographic locator system that specifies a location on the earth's surface. Section, township and range are terms used in the Public Land Survey System. In this system, land areas are subdivided into quadrangles, usually containing 16 townships; each township is about 36 square miles. Townships are divided into 36 sections; each about 1 square mile in area. Sections are then divided into quarters and quarter-quarters; a "quarter-quarter" is 1/16th of a section or about 40 acres.

Seepage - That portion of diverted or withdrawn water which is lost in transit to the place of use (not including evapotranspiration) or which moves below the root zone in an irrigation field.

Senior Water Right - Any water right with a priority date earlier than the water right under consideration.

SEPA - The State Environmental Policy Act (see chapter 43.21C RCW).

Short Term Permit - An authorization issued by the department to use water for a time period of less than one year when the water user has no intention of establishing an appropriative water right.

Significant Modification - The deepening or reaming of a well, lowering the pump bowls by adding lengths of pump column, adding water quality treatment devices, or other similar modifications, where the total cost or value of such modifications exceeds (1) \$500.00 for domestic, stock or other water withdrawal facilities withdrawing less than 5,000 gallons per day, or (2) \$2500.00 for all other facilities.

Single Domestic - The domestic use of water by an individual residence.

Storativity - The volume of water that a permeable unit, i.e., aquifer, will absorb or expel from storage per unit surface area per unit change in head. In an unconfined aquifer, the storativity value is equal to the *Specific Yield*. The specific yield of the aquifer can be used to estimate the time between when pumping begins and equilibrium groundwater conditions are reached.

Superseding Certificate - A document issued by the department pursuant to chapter 90.03 RCW to evidence a change or modification to a certificate of water right.

Supplemental Water Right - A water right issued by the department as the back-up for a primary water right. The supplemental water right can be exercised only when water is not available to satisfy the primary water right (see primary water right).

Surface Water - (1) A body of water such as a stream, a lake, or spring at or on the land surface, or (2) water flowing in or overland to a stream or present in a lake, pond, or wetland.

Surface Water Right - An authorization to divert and use surface water for a beneficial purpose established pursuant to chapter 90.03 RCW or under prior existing statutory or common laws of the State of Washington or the United States which has not been abandoned or relinquished.

Target Flow -- A flow level a planning group may set as desirable to meet some management “target” goal. It is achievable and has a biological base, and may be attained through measures such as conservation or restoration. A term associated with the ESA. “Target flow” is not defined in Washington State law.

Temporary Permit - A document issued by the department pursuant to chapter 90.03 RCW in response to a request for a temporary permit that conveys authority to use water while the department is reviewing an application for water right.

Tributary - A stream or body of ground water that discharges to a larger stream or body of water.

Trust Water Right - Any water right acquired by the state under Chapter 90.42 or 90.38 RCW by purchase, lease, receipt of gift or thorough state or federal water conservation investments.

Upper Aquifer Zone - All aquifers within a multiple aquifer system lying between the land surface and a geologic formation which acts to retard the downward migration of water or as set forth in the ground water subarea management program for the area, if one exists (WAC 173-154-040(7)).

Vested Water Right - A right to use surface water established prior to the effective date of chapter 90.03 RCW or to use ground water prior to the effective date of the 1945 ground water code (chapter 90.44 RCW).

Waste - Diversion or withdrawal and use of water in excess of what would be reasonable and appropriate under the circumstances using reasonably efficient practices to accomplish the intended purpose.

Water Resource Inventory Area or (WRIA) - One of 62 geographic areas of the state based generally on drainage patterns and demarcated on the map in WAC 173-500-990.

Water Right - A legal right to make beneficial use of public waters of the State of Washington.

Water Right Claim -- A claim to the right to withdraw or divert and make beneficial use of public surface or ground waters of the state, filed on a form provided by Ecology and registered with Ecology in accordance with Chapter 90.14 RCW. Registration of a water right claim was required in order to retain the use of surface water if such use was established prior to enactment of Chapter 90.03 RCW (June 1917); to retain use of ground water if such use was developed prior to enactment of the Chapter 90.44 RCW (June 6, 1945); and to retain use of ground water subject to the permitting exemption of Section 90.44.050 RCW. Parties possessing valid water right permits and/or certificates obtained through the permitting provisions of Chapters 90.03 and 90.44 RCW were not required to register such water right claims.

Water System Plan - A document describing a public water system developed and submitted to the Washington State Department of Health in compliance with chapter 246-290 WAC.

Watershed - A region in which rainfall or snowmelt water flows toward a single point. Thus, it is any hollow or trough in the earth's crust, whether filled by water or not. A watershed is the total area drained by a river and its tributaries. Used interchangeably with basin.

Well - Any excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed when the intended use of the excavation is for the location, diversion, artificial recharge, or withdrawal of ground water. Well includes water-supply well and resource protection well. Well does not mean excavations excluded in chapter 173-160-WAC.

Withdrawal - (1) The physical structures constructed to take ground water from an aquifer into a pipe or other conduit by means of gravity flow or by pumping, or (2) the action of removing ground water from an aquifer.