Middle Snake Watershed Plan DRAFT

APRIL 2006

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MIDDLE SNAKE WATERSHED PLAN

PLANNING UNIT DRAFT

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Middle Snake River Watershed Watershed Plan Executive Summary

The purpose of watershed planning under the Washington Watershed Management Act (WMA) is to provide a method to help achieve a balance among competing water resource demands. Water demands for commercial, industrial, residential and agricultural activities (e.g. out of stream uses) have to be balanced with instream fish habitat needs. Demands such as irrigated agriculture provide a significant economic base for the WRIA. Critical habitat for fish species listed under the federal Endangered Species Act (ESA) as well as a diversity of non-listed fish and wildlife are also dependent upon water resources. The Basin's surface water resources also offer recreational opportunities and natural beauty for residents and visitors.

Watershed Planning Process

The development of a watershed plan is Phase III of voluntary watershed planning under the WMA. WMA identifies a group of "initiating governments" that are empowered to select a lead agency, apply for grant funding, determine the overall scope of planning, and convene a "Planning Unit." The initiating governments include all counties within the WRIA, the government of the largest city or town (if applicable), the water supply utility obtaining the largest quantity of water from the WRIA, and Indian tribes with reservation lands within the management area. Funding is provided through the WMA for areas in Washington State that wish to undertake planning and specifies ground rules for use of the funding.

The WMA identifies the Planning Unit as the group that develops and initially approves the watershed plan. It calls for either a consensus approval by all members of the Planning Unit, or a consensus of the governmental members and a majority vote by remaining members of the Planning Unit. Following approval by the Planning Unit, and a requisite public meeting held by each county legislative authority, the WMA calls for a joint session of the legislative bodies of all counties in the watershed to consider the plan. Once the plan has been approved by both the Planning Unit and joint session of county legislative bodies, it requires counties and State agencies to implement plan elements, which they agreed to be obligated to upon entering the planning process.

Under Phase 1 of the Watershed Planning Process (RCW 90.82), the Planning Unit and Committee Organization for WRIA 35 – Middle Snake River Basin was formed in April 2003.

Watershed Plan

This watershed plan documents the process of using the assessment data gathered during Phase II (Level 1 Watershed Technical Assessment, 2005) to develop objectives and

actions for the implementation areas identified within planning area. The document is organized as follows:

- Section 1 – Introduction and Background
- Section 2 – Planning Process
- Section 3 – Key Planning Elements by Implementation Area
- Section 4 – General Strategies and Tools
- Section 5 – Basin Wide Management Objectives
- Section 6 – Implementation Area Strategies
- Section 7 – Plan Implementation Considerations

Planning Area Boundaries

The Middle Snake River Watershed (WRIA 35) occupies approximately 2,250 square miles in southeastern Washington along the Idaho border to the east and Oregon border to the south. The Middle Snake Watershed encompasses portions of Asotin, Whitman, Garfield, and Columbia Counties within Washington. The City of Clarkston and towns of Starbuck, Pomeroy, and Asotin are also located within WRIA 35.

Land use is approximately 50 percent rangeland, 33 percent agriculture, 15 percent forestland and 1 percent urban. The population is less than approximately 25,000. Population growth projections for the area are expected to reach 33,000 by 2020, which is low given the extent of the geographic area, yet nonetheless represents a future need.

Planning Topic Opportunities

During initial planning efforts, the Planning Unit decided to address the required water quantity component of watershed planning along with the all three of the optional components including instream flow, water quality, and habitat. Despite the limited population, previous studies in the basin have identified both water quantity issues with stream flow limited streams (e.g. in the Tucannon River and ground water in the Clarkston area), and water quality issues to be of concern in the basin. The WRIA 35 planning area includes federally listed Endangered Species, including Fall Chinook, Spring/Summer Chinook, Steelhead and Bull Trout.

Implementation Areas

For the purposes of watershed management, the following five distinct Implementation Areas make up WRIA 35:

- Asotin Creek Implementation Area
- Middle Snake River Implementation Area
- Pataha Creek Implementation Area
- Tucannon River Implementation Area
- Grande Ronde Subbasin Implementation Area

Implementation Areas were formed based on variations in land use, habitat, and hydrologic characteristics within the WRIA.

Asotin Creek Implementation Area

The Asotin Creek Implementation Area is located in Asotin and Garfield Counties. The major stream reaches located within this area include Asotin Creek, Tenmile Creek, and Couse Creek. Asotin Creek has two major drainages, the mainstem and George Creek. Major tributaries to the mainstem include Charley Creek, North Fork of Asotin Creek, South Fork of Asotin Creek, and Lick Creek. George Creek's major tributaries include Pintler Creek, Nims Gulch, Ayers Gulch, Kelly Creek, Rockpile Creek, and Coombs Canyon. Tenmile and Couse Creeks both drain into the Snake River south of Asotin. Pasture and rangeland, cropland, and forestland are the predominant land uses. The City of Asotin is the primary population center.

The Asotin Creek Implementation Area is part of the ceded lands of the Nez Perce Tribe. In the Treaty of 1855, the Nez Perce retained total fishing rights on all streams and rivers within the boundaries of the original 13.4 million acre reservation that extended outward to "all usual and accustomed places," including the mainstem Columbia River.

Middle Snake River Implementation Area

The Middle Snake River implementation area is composed of portions of Columbia, Whitman, Garfield and Asotin counties. The streams that drain the north side of the Snake River in Whitman County include Alkali Flat Creek, Penawawa, Almota, Wawawai and Steptoe Canyon creeks. The streams that drain from the south, primarily in Garfield County cover include Alpowa, Deadman and Meadow Creeks. The two dams on the Middle Snake River include Lower Granite (RM42) and Little Goose Dams (RM70). This implementation area includes the City of Clarkston, the largest population center in the watershed. The Lewiston-Clarkston area represents the majority of industrial, commercial, and residential development in the watershed. There is minimal other development in the implementation area. Agriculture in the implementation area is dominated by non-irrigated farming in the uplands, irrigated farming in the lower valleys, and cattle ranching. Little forestry activity occurs in this area.

Pataha Creek Implementation Area

The Pataha Creek implementation area is located mainly in Garfield County and partially in Columbia County. Pataha Creek, the major stream in this area, drains into the Tucannon River at River Mile 11.2. Although in other studies it has been included as part of the Tucannon River sub-basin, it is included in this plan as a separate implementation area because of unique characteristics that differentiate it from the rest of the Tucannon sub-basin. Major tributaries of Pataha Creek are seasonal streams that include Dry Pataha Creek, Sweeney Gulch, Balmaier Gulch, Linville Creek, Tatman Gulch, and Dry Hollow. The primary land use is agriculture, mainly non-irrigated

cropland farming and livestock production. The primary city is the City of Pomeroy, located on Pataha Creek in the northeastern portion of the sub-basin.

Tucannon River Implementation Area

The Tucannon River implementation area is located within Columbia and Garfield counties. The Tucannon River has two major drainages, the mainstem and Pataha Creek. Major tributaries to the mainstem Tucannon (besides Pataha Creek) include Willow Creek, Kellogg Creek, Cummings Creek, Little Tucannon River, Panjab Creek, Sheep Creek, and Bear Creek.

The Tucannon River valley has a long history of Native American usage and homesteading. The Tucannon River Subbasin is within the treaty territory of the Nez Perce Tribe and is protected as a usual and accustomed area via the treaty of 1855. The Nez Perce Tribe maintains a co-management authority with the State of Washington and the United States Government over the tribes' treaty reserved resources. The Tucannon River Subbasin is also part of the usual and accustomed area for the Confederated Tribes of the Umatilla Indian Reservation. Currently, the Tucannon River Subbasin provides hunting, fishing and gathering opportunities for tribal members

The major land uses in the Tucannon River watershed are related to agricultural purposes (SCS 1991), with 75 percent of the subbasin in private ownership, primarily in the lower reaches. Crop, forest, rangeland, pasture, and hay comprise over 90 percent of the watershed, with grazed rangeland being the majority of the land use. Dry and irrigated cropland is used to produce winter wheat, barley, peas, and bluegrass.

Grande Ronde Subbasin Implementation Area

The entire Grande Ronde subbasin encompasses an area of about 4,000 square miles in northeast Oregon and southeast Washington. The portion of the implementation area for WRIA 35 includes portions of Asotin, Columbia, and Garfield counties. The primary Grande Ronde River tributary located within Washington is Joseph Creek. The other major tributaries are located in Oregon. There are no urban centers within the implementation area.

The Nez Perce Tribe is responsible for managing, protecting, and enhancing treaty fish and wildlife resources and habitats for present and future generations in the Grande Ronde River subbasin. The Nez Perce Tribe individually and/or jointly implements restoration and mitigation activities throughout their areas of interest and influence.

Relationship to Other Water Resource Programs and Plans

In virtually every basin around the State, a variety of regulatory programs, ongoing water resource management activities, and past or ongoing studies must be factored into

watershed planning. A watershed plan under the WMA does not supersede other federal, state, or local requirements, but rather provides a framework for state, local, and even federal agencies to modify and coordinate existing or pending actions to reflect documented findings and local management direction in each watershed. If there is clear definition and broad support of planning recommendations, state and federal agencies may view the watershed plan as an expression of the public interest, lending significant credibility and support for consistent and complementary agency actions.

Salmon Recovery and Subbasin Plans

WRIA 35 watershed planning efforts are being closely coordinated with state-sponsored salmon recovery planning for the Snake River Basin and BPA/Northwest Power Planning Council (NPPC)-sponsored subbasin planning efforts within the WRIA.

The recovery strategy and associated actions developed as part of the draft and final Snake River Region Salmon Recovery Plan is the habitat component of this watershed plan along with subbasin plans (SRSRB 2005). The development of State and federal recovery plans has been anticipated, tracked, and integrated into the watershed planning process in the assessment, plan development and plan implementation stages.

The Snake River Salmon Recovery Board (SRSRB) is responsible for addressing SRA issues in the Snake River Basin, which includes WRIA 35. The SRSRB released a draft recovery plan in 2005 that is consistent with the State Model for Recovery Plans. The recovery plan addresses the following federal ESA-listed and Washington state Species of Concern: bull trout, steelhead trout, Chinook (spring, summer and fall) salmon, and sockeye salmon.

The WRIA 35 planning effort also integrates portions of the Bonneville Power Administration/Northwest Power Planning Council's (NPPC) Subbasin Plans developed for the Asotin, Middle Snake, Tucannon and Grande Ronde. Subbasin plans were completed in 2004 for each the geographic areas encompassing WRIA 35 (Asotin - May 2004; Grande Ronde - Dec 2004 with Supplement Jan 2005; Tucannon - May 2004; Lower Snake – May 2004). Development of the sub-basin plans have been supported by the WRIA 35 Planning Unit and, as indicated in the discussion above, have also been used to develop the Draft Snake River Salmon Recovery Plan.

Initiating Governments

The initiating governments are Asotin, Garfield, Columbia and Whitman Counties, the City of Clarkston, and the Asotin County Public Utilities District (PUD) as the major water purveyor. In accordance with the WMA, the initiating governments for the WRIA 35 basin designated Asotin County PUD as the lead agency for watershed planning.

Planning Unit Mission and Participants

The Asotin established a core Planning Unit and Steering Committee with representation from various agencies and stakeholders in WRIA 35. The mission of the Planning Unit is to treat water as a valuable resource through the development and implementation of a watershed plan consistent with RCW 90.82 for the beneficial management of water resources to balance the present and future needs of local rural and urban communities, agriculture and other industries, fish and wildlife, and tribal communities and treaty rights.

Stakeholders in the watershed, including local, state, and federal agencies, are represented on the Planning Unit in a voting capacity. Agency representatives also provide assistance and guidance. The Asotin PUD hired Economic and Engineering Services, Inc. (now part of HDR Inc.) to provide technical support in preparation of the watershed management plan and supporting documentation.

Planning Elements

The Watershed Management Act (WMA) identifies one required element (water quantity) and three optional elements (water quality, instream flows, and habitat) of watershed planning. While developing its mission and planning goals in 2003, the Planning Unit determined that all four elements would be included in the Middle Snake Watershed Plan.

Water Quantity

This element involves assessing water supply and use in the management area, and developing strategies for future use. It involves items such as assessment of available water, inventory of water rights, projections for future water demand, and methods for increasing available water.

Instream Flow

The planning unit may request that the Department of Ecology (Ecology) modify laws concerning existing minimum instream flows, or adopt new minimum instream flows for streams that do not have them. Chapter 90.82 RCW establishes a specific procedure for recommending instream flows that gives tribes and local government members of the planning unit the responsibility to make the planning unit's decisions on this topic.

In 2005, the following technical memoranda were developed to address the central aspects of managing instream flows within WRIA 35:

- Technical Memorandum No. 1: Stream flow management framework (TM-1)
- Technical Memorandum No. 2a: Minimum Instream Flow Framework (TM-2a)
- Technical Memorandum No. 2b: Proposal for Administrative Closures (TM-2b)
- Technical Memorandum No. 3: Proposed Flow Enhancement Targets for WRIA 35 (TM-3)

These memoranda were intended to support an overall stream flow management strategy

Water Quality

The Water Quality element includes items such as the degree to which existing standards are being met, the causes of water quality violations, consideration of total maximum daily loads (TMDL), and recommendations for monitoring. The planning unit is not authorized to set water quality standards, but can provide input as Ecology establishes TMDLs.

Habitat

The Habitat element involves "coordination and development of the watershed plan to protect or enhance fish habitat in the management area." The law emphasizes integration with other laws and programs that address habitat restoration and recovery, particularly, the Salmon Recovery Act. Setting and restoring instream flows and managing demand and hydraulic continuity effects are among the key elements of habitat protection and restoration. Key factors in addressing aquatic habitat needs in WRIA 35 are the identification of major and minor spawning areas (MSA and mSA respectively), imminent threats, and priority protection and restoration areas.

Target Assessments

The following Level 2 target assessments are scheduled to be completed in conjunction with the publication of this planning document:

- Tucannon Temperature Model – development of a temperature model for the Tucannon River, including an evaluation of natural riparian conditions.
- Multi-Purpose Storage Assessment – evaluation of the feasibility of using water storage to improve low flow conditions.
- Storage Pre-Construction Grant – collect baseline information and develop conceptual design for one or more storage opportunities.

Public Involvement Process

The WRIA 35 Planning Unit directed the public involvement process. The purpose of this work is to help the WRIA 35 Planning Unit identify issues of concern in each sub-basin of the Middle Snake Watershed and to integrate public perception of watershed issues into the early stages of watershed assessment and plan development. Public involvement was sought through direct participation in the Planning Unit and through participation in one or more of a series of outreach workshops. Information on ongoing assessments and plan development was made available to the public through a web site and notices in local newspapers.

Key Planning Elements by Implementation Area

This plan addresses water quantity, water quality, instream flow and habitat elements. Section 3 of this plan is designed to generally describe the existing conditions within each implementation area, and then specifically address how those conditions currently affect the four key planning elements.

Asotin Creek Implementation Area

According to the Draft Asotin Creek Subbasin Summary (NPPC 2001), historic and current land use practices have altered the hydrologic cycle of Asotin Creek. Farming, timber harvesting, and urbanization have changed the water cycle, reducing water infiltration and accelerating runoff.

Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in improved watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Asotin County Conservation District through funding reports to the Bonneville Power Administration (BPA) Columbia Basin Fish and Wildlife Authority and are presented in Section 3.2.1.

Water Quantity

There are four major categories of water users identified in the Asotin Creek IA including major public water systems (City of Asotin), small public water systems (Anatone), individual household wells, and agricultural water users. Because the communities in this area are relatively small and pasture, rangeland, and cropland are the predominate landuses, the most significant water use is associated with agriculture, including stock watering and pastures. Section 3.2.2 includes summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights.

Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

Water Quality

Major water pollutants within the IA are temperature and fecal coliform, with temperature the most significant water quality impairment. Most high stream temperatures in the Asotin Creek drainage have been attributed to an overall reduction of

riparian vegetation. Section 3.2.4 shows the most recent 303(d) list of impaired water bodies released by Ecology. TMDLs are required for the water bodies in this category, but TMDLs are not yet underway for this IA.

Aquatic Habitat

The Draft Snake River Salmon Recovery Plan (SRSRP) (Parametrix 2005) and Limiting Factors Analysis (LFA) (Kuttel 2002) have identified the Snake River steelhead, Spring and Summer Chinook, and Bull trout as focal species within the Asotin Creek Implementation Area. The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area in Section 3.2.5.

Middle Snake Mainstem Implementation Area

The USACE controls some public lands adjacent to the reservoirs, with a few isolated parcels owned by the State of Washington. Most of the lands adjacent to the Snake River through this area are privately owned. Agriculture is the primary land use, which is dominated by non-irrigated farming in the uplands, irrigated farming in the valleys, and cattle ranching. A relatively small timber harvest occurs on portions of the forested upper watershed. The City of Clarkston represents the only significant urban development and represents approximately 87 percent of the total IA population. It is expected that roughly 90 percent of the population will reside in Clarkston by 2025.

Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Pomeroy County Conservation District through funding reports to the Bonneville Power Administration (BPA) Columbia Basin Fish and Wildlife Authority are presented in Section 3.3.1.

Water Quantity

The major categories of water users are major public water systems (City of Clarkston), small public water systems, self-supplied commercial/industrial users (primarily in the Clarkston urban area, but not supplied by Asotin PUD), individual household wells, agricultural water users. Although a majority of the population resides in Clarkston, pasture and rangeland, cropland, and forestland are the predominant land uses. Consequently, most water use is associated with agriculture. Summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights, respectively, are provided in Section 3.3.2.

Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

Water Quality

The primary water quality concerns in the Snake River mainstem are elevated temperature along the entire length, excessive pH, low dissolved oxygen, increased total dissolved gas, and high toxics levels. Water quality impacts to tributary streams within the IA typically include high summer temperatures, excessive fecal coliforms, and low dissolved oxygen. Section 3.3.4 includes the most recent 303(d) list of impaired water bodies released by Ecology.

Aquatic Habitat

The SRSRP and LFA have identified Snake River steelhead, Spring and Summer Chinook, and Bull trout the as focal species within the Middle Snake Implementation Area. The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area are discussed in Section 3.3.5.

Pataha Creek Implementation Area

The primary land use is non-irrigated cropland farming and livestock production. Most of the irrigated cropland is located in the valley adjacent to Pataha Creek. Major jurisdictions in the area include Garfield County, Columbia County, and the USFS (Umatilla National Forest). The primary urban area is the City of Pomeroy, located on Pataha Creek in the northeastern portion of the IA. The population is anticipated to increase within the IA from 2,825 in the 2005 to 3,055 by the year 2025. Approximately 54 percent of the population currently resides in the City of Pomeroy; this is expected to increase to roughly 58 percent by 2025.

Historical, Current and Ongoing Watershed Activities

In 1993, BPA funded the Pataha Creek Model Watershed Project for implementation of watershed activities in the subbasin. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Pomeroy County Conservation District through reports prepared for the Bonneville Power Administration and other state and federal agencies are presented in Section 3.4.1.

Water Quantity

The primary categories of water use in the area are major public water systems (City of Pomeroy), small public water systems, self-supplied commercial/industrial users,

individual household wells; and agricultural water users. Because the primary land uses are connected with agriculture (i.e. pasture and rangeland, cropland, and forestland), the City of Pomeroy represents only a relatively small overall water demand, while the most significant water use is associated with agricultural. Summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights, respectively, are presented in Section 3.4.2.

Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

Water Quality

Elevated stream temperature and excessive fecal coliform concentrations were the primary water quality concerns in Pataha Creek, as identified in the Level I Assessment. In addition, total suspended solids concentrations, turbidity, and high pH levels are also of concern as potential limiting factors to salmonid rearing in the lower and middle portions of Pataha Creek. Pataha Creek has been identified as a major contributor of sediment to the Tucannon River. Section 3.4.4 shows the most recent 303(d) list of impaired water bodies released by Ecology.

The SRSRP and LFA have identified Snake River steelhead, Spring and Summer Chinook, and Bull trout as focal species within the Pataha Creek Implementation Area. The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area are presented in Section 3.4.5.

Tucannon River Implementation Area

The area is rural, with a 2005 population of approximately 1,454. Approximately 11 percent of the population lives in the City of Starbuck. The population is expected to remain constant through the year 2025.

Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Columbia County Conservation District through funding reports to the Bonneville Power Administration (BPA) Columbia Basin Fish and Wildlife Authority is presented in Section 3.5.1.

Water Quantity

The major categories of water use in the Tucannon River IA are major public water systems (City of Starbuck), small public water systems (Group B), self-supplied commercial/industrial users, individual household wells, and agricultural water users. Water used by the City of Starbuck represents a relatively small portion of the total water use in the area. The primary water use is associated with agriculture, such as crop irrigation and stock watering. Summaries of the types of use and related quantities for surface and groundwater permitted and certified water rights respectively are provided in Section 3.5.2.

Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

Water Quality

The primary water quality issues identified in the Level I Assessment for the Tucannon River are elevated stream temperatures throughout the river and high fecal coliform concentrations near the mouth. Section 3.5.4 shows the most recent 303(d) list of impaired water bodies released by Ecology.

Aquatic Habitat

The SRSRP and LFA have identified Snake River steelhead, Spring and Summer Chinook, and Bull trout as focal species within the Tucannon River Implementation Area. The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area in Section 3.5.5.

Grande Ronde Implementation Area

Land use in the area is largely centered on agricultural (irrigated and non-irrigated crops, and grazing), and timber harvesting within forested areas. The Grande Ronde IA is rural with no established urban areas; population in the year 2005 is approximately 558 and is expected to drop slightly to 515 by the year 2025.

Historical, Current and Ongoing Watershed Activities

In 1992, the Northwest Power Planning Council (NPPC) selected the Grande Ronde river basin to be the site of Oregon's model watershed project. The Grande Ronde Model Watershed program (www.grmw.org) covers 5,265 square miles, primarily in Oregon, with a small portion in southeast Washington. While the majority of watershed restoration and recovery efforts for the basin have been implemented in Oregon, a few

project, noted in Section 3.6.1, have taken place in the Washington portion of the watershed.

Water Quantity

There are no urban areas in the IA. As a result, the primary water use categories include small public water systems, individual household wells, and agricultural water users. Irrigated agriculture accounts for the largest portion of water use in the area. Section 3.6.2 provides summaries of the types of use and related quantities for surface and groundwater permitted and certified water rights.

Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

Water Quality

Most available water quality data in the Grande Ronde IA is focused on the Grande Ronde River mainstem. Specific water quality data from Ecology is not generally available for tributary streams other than temperature data from the mouth of Wenatchee Creek, which has been found to exceed state water quality standards. According to available data, the primary concerns for the Grande Ronde mainstem are elevated summer temperatures and suspended sediment. Section 3.6.3 shows the most recent 303(d) list of impaired water bodies released by Ecology.

Aquatic Habitat

The SRSRP and LFA have identified Snake River steelhead, Spring and Summer Chinook, and Bull trout as focal species within the Pataha Creek Implementation Area. The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area in Section 3.6.5.

General Strategies and Tools

Key planning issues for WRIA 35 have been identified in Sections 5 and 6 in the areas of water supply, instream flow, water quality, and aquatic habitat. General strategies or "tool sets" that can be used to address the key planning issues are discussed in Section 4, and specific tools (e.g. programs, projects, BMPs, regulations, etc) are described in detail in Appendix B. A listing of the tools is presented in eight broad categories:

- Water conservation
- Water storage
- Water quality

- Groundwater management
- Groundwater quality
- Regulatory / administrative
- Habitat Enhancement
- Monitoring

The strategies and tools include measures that can be implemented by the Planning Unit, federal, state, and local agencies, tribes, conservation districts, individual landowners, and other stakeholders and water users in addressing key planning issues. The inclusion of a specific strategy or tool herein is not intended as a recommendation for its use within WRIA 35, rather, it is provided here as a menu of some of the possible actions or strategies that are available to address key planning issues within the watershed. This listing of possible tools, while extensive, is by no means exhaustive, and the Planning Unit and other stakeholders may identify and select other means to address the key planning issues discussed within this Plan.

Basin Wide Management Objectives

Basin-wide management objectives were identified by Planning Unit members through public workshops, in response to various technical assessments and supporting studies, and as additional concepts and/or issues emerged during the planning process. In identifying objectives and actions for the Implementation Areas in WRIA 35, objectives and actions common to most, if not all, of the entire basin were identified. Many of these general objectives and actions have translated into more specific objectives and actions in the Implementation Area action plans, demonstrating how basin-wide objectives apply in a specific geographic region.

A full list of objectives is provided in Section 5. A summary of basin-wide goals includes::

- Protect existing water rights, private property rights and tribal treaty rights
- Emphasize voluntary and incentive-based management solutions
- Maintain and enhance the regional economy and provide future economic opportunities associated with the watershed hydrology, including but not limited to potable water, agriculture, industry, recreation and tourism
- Establish and maintain ongoing education and public involvement program
- Establish a detailed funding plan for implementation, including: projects, programs, long-term monitoring and evaluation of watershed plan implementation
- Ensure fairness in distributing costs and burdens of water resource management actions
- Obtain local, state and federal agencies (regulatory and management) and tribal buy-in and cooperation for recommended management strategies (Note: This section will be updated when instream flow recommendations are finalized by the Planning Unit)

- Provide long-term reliable and predictable water supplies for human uses
- Identify minimum and target stream flows, and manage stream flows to enhance habitat conditions for salmonids, with emphasis on steelhead and bull trout
- Protect surface and ground water quality needed for public drinking water supplies, agriculture, recreation, fish and other uses
- Improve certainty, timeliness and efficiency in water right decisions
- Improve scientific basis for understanding baseline conditions
- Identify and implement water conservation and efficiency strategies
- Maintain productive riparian habitat and enhance degraded habitat for salmonids in all life stages

Implementation Area Strategies

Asotin Creek Implementation Area Planning Objectives and Actions

Specific objectives and actions identified for each of the five implementation areas are listed in Section 6. These area-specific objectives and actions are based upon the existing conditions set forth in Section 3, input from the planning workshops, and consideration of basin-wide objectives described in Section 5.

Specific objectives for the Asotin Creek Implementation Area are listed in Section 6.1. These are in addition to the Basin-wide objectives and actions described in Section 5. The objectives are categorized by water quantity, water quality, aquatic habitat, regulatory actions and miscellaneous studies.

Asotin Creek Implementation Area Actions
Water Quantity Management
Improve irrigation efficiencies, including conveyance and application methods.
Upgrade diversions to include meters where needed
Upgrade wells to include meters where needed
Continue instream flow monitoring through permanent and seasonal gauges on Asotin Creek.
Characterize ground water conditions to determine if an additional 81 afy withdrawal from ground water is sustainable
Seek additional water rights to develop additional water supply of 81 afy from ground water to provide future needs of City of Asotin, if study determines withdrawal is sustainable
Water Quality Management
Identify sources and implement the following strategies to reduce fecal coliform levels on Asotin Creek: 1. manure management (6 locations on Asotin Ck, 2 on Couse Ck, 3 on Tenmile Ck) 2. upgrade or connect septic to sewer 3. explore opportunities for regionalization of wastewater treatment plant 4. connect fringe rural areas to urban sewer systems
Implement the following strategies to reduce TSS levels at the mouth of Asotin Creek: 5. direct seed, upland management BMPs, riparian improvement, CRP, grassed waterways, sediment basins, weed control, grazing management, cross fencing, alternative water sources, manure management (livestock operations)
Implement strategies to reduce water temperatures
Adopt the Eastern Washington Stormwater manual and implement the following strategies to improve stormwater management and treatment and increase groundwater infiltration: sediment basins, infiltration trenches,

swales/wetlands, rural/urban drainage ditch upgrades and treatment
Identify and designate aquifer recharge areas
Protect known aquifer recharge areas through critical area ordinances
Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: restore riparian areas, urban/rural education program, conservation tillage
Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: 1. maintain existing CRP acres (including exploring alternative funding), conservation tillage, increase grassed waterways, buffers, strip cropping, improve riparian grazing management
Aquatic Habitat Enhancement
Implement aquatic habitat restoration plans; including the following priority projects: 1. Enhancement Restoration 2. Protection and Restoration of Asotin Creek 3. Asotin County Fish Screening 4. Riparian Buffers 5. Upland Sediment Reduction 6. Large Woody Debris Replenishment and Replacement Enhancement
Implement passive restoration projects, including Conservation Reserve Expanded Program riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration
Implement aquatic habitat protection plans, including list of prioritized projects 1.Enhancement Restoration 2. Protection and Restoration of Asotin Creek 3. Asotin County Fish Screening 4. Riparian Buffers 5. Upland Sediment Reduction 6. Large Woody Debris Replenishment and Replacement Enhancement
Remove the following fish passage obstructions: Headgate Dam, Asotin Creek, river mile 9.1 Trent Grade culvert, George Creek, river mile 18.8 Asotin Road culvert, Charley Creek, river mile 0.2 Mill Creek Road culvert, Mill Creek, river mile 2.9 Pond Dam, Tenmile Creek, river mile 15.3
Conduct inventory and analysis of other fish passage barriers, and prioritize for removal
Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.
Restore areas of degraded riparian vegetation on private and public land through activities such as CREP and CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas
Work with private and public landowners to maintain and enhance pristine and other areas of the headwaters by encouraging application of BMPs
Regulatory Actions
Establish minimum instream flows for Asotin Creek
Establish administrative stream closures, to include all Asotin Creek tributaries (timeframe to be determined)
Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.
Review and update, as needed, best-available-science-based riparian buffer zones and critical areas regulations.
Miscellaneous Studies
Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals to meet City of Asotin needs.
Identify specific stream fords that could be eliminated by installing bridges or culverts. Pursue project funding

Middle Snake River Implementation Area Planning Objectives and Actions

Specific objectives for the Middle Snake River Implementation Area are listed in Section 6.2. These are in addition to the Basin-wide objectives and actions described in Section 5.

The objectives are categorized by water quantity, water quality, aquatic habitat, regulatory actions and miscellaneous studies.

Middle Snake River Implementation Area Actions
Water Quantity Management
Continue instream flow monitoring through permanent and seasonal gauges.
Characterize ground water conditions to determine if an additional 1,160 afy withdrawal from ground water is sustainable
Characterize basalt groundwater sources, availability and sustainability near Snake River and below, where basalt is connected to Snake River
Sole source aquifer study
Characterize ground water conditions to determine if additional withdrawals to replace some of the existing surface water withdrawals for irrigation is possible and sustainable
Seek additional water rights to develop additional water supply from ground water to replace surface water withdrawals for irrigation if study determines withdrawal is sustainable
Water Quality Management
Investigate sources and implement appropriate strategies to reduce fecal coliform levels on Alpowa Creek.
Continue water quality monitoring through permanent and seasonal gauges for temperature, fecal coliform, dissolved oxygen, sediment and TSS.
Implement the following strategies to improve stormwater management and treatment and increase groundwater infiltration: Implement rural road BMPs, Shaping/ grading, mowing vs. spraying
Identify and designate aquifer recharge areas
Protect known aquifer recharge areas through critical area ordinances
Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: restore riparian areas, urban/rural education program, conservation tillage
Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: noxious weed control, maintain existing CRP acres (including exploring alternative funding), conservation tillage, increase grassed waterways, buffers, strip cropping, improve riparian grazing management
Aquatic Habitat Enhancement
Implement aquatic habitat protection plans, including list of prioritized projects
Implement passive restoration projects, including Conservation Reserve Expanded Program riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration
Remove the following fish passage obstructions: Headcut, Almota Creek, river mile 1.1 Lynn Gulch culvert, Deadman Creek, river mile 0.4 Perched culvert, Wawawai Creek, river mile 0.1 Sediment deposition in delta, Steptoe Creek, river mile 0.0 1st road crossing culvert, Steptoe Creek, river mile 0.2 2nd road crossing culvert, Steptoe Creek, river mile 0.8 Headcut falls, Alkali Flat Creek, river mile 7.0
Conduct inventory and analysis of other fish passage barriers, and prioritize for removal
Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.
Restore areas of degraded riparian vegetation on private and public land through activities such as CREP, CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.
Regulatory Actions
Establish administrative stream closures (time period to be determined) (close water use for storage)
Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.
Review and update, as needed, best-available-science-based riparian buffer zones and critical areas regulations.
Miscellaneous Studies
Identify specific stream fords that could be eliminated by installing bridges or culverts.

Pataha Creek Implementation Area Planning Objectives and Actions

Specific objectives for the Pataha Creek Implementation Area are listed in Section 6.3. These are in addition to the Basin-wide objectives and actions described in Section 5. The objectives are categorized by water quantity, water quality, aquatic habitat, regulatory actions and miscellaneous studies.

Pataha Creek Implementation Area Actions
Water Quantity Management
Continue/expand instream flow monitoring through permanent and seasonal gauges on Pataha Creek.
Characterize ground water conditions to determine if an additional 62 afy withdrawal from ground water is sustainable
Develop additional water supply of 62 afy from ground water to provide future needs of City of Pomeroy if study determines withdrawal is sustainable
Characterize ground water conditions to determine if additional withdrawals to replace some of the existing surface water withdrawals for irrigation is possible and sustainable
Seek additional water rights to develop additional water supply from ground water to replace surface water withdrawals for irrigation if study determines withdrawal is sustainable
Identify opportunities for irrigation efficiency
Implement pilot project to encourage beaver activity for multi-purpose storage through dams, wetlands and water retention
Water Quality Management
Implement the following strategies to reduce fecal coliform levels in Pataha Creek: identify failing septic systems, restore riparian buffers, manage grazing in riparian areas
Implement the following strategies to reduce TSS levels in Pataha Creek by reducing the sediment load entering the creek: CRP, conservation tillage, increase grassed waterways, buffers, strip cropping, improve riparian grazing management
Implement the following strategies to reduce water temperatures: riparian enhancement
Protect known aquifer recharge areas through critical area ordinances; include areas necessary to protect City of Pomeroy's water source (spring).
Work with individual landowners to review pesticide and fertilizer use; and to implement best management practices to limit water quality impacts: restore riparian areas, urban/rural education program, conservation tillage
Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: conservation tillage, increase grassed waterways, buffers, strip cropping, improve riparian grazing management
Aquatic Habitat Enhancement
Conduct inventory and analysis of fish passage barriers, and prioritize for removal
Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.
Restore areas of degraded riparian vegetation on private and public land through activities such as CREP, CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.
Restore areas of degraded riparian vegetation on private and public land through conservation easements with an early emphasis on the most degraded areas.
Work with private and public landowners to use best management practices to maintain and enhance pristine and other areas of the headwaters by applying BMPs
Remove fish passage obstructions Highway 261 Culvert at Delaney, Pataha Creek, river mile 1.3 Dodge Bridge, Pataha Creek, river mile 10.8 20th St Sewer Line (City of Pomeroy), Pataha Creek, river mile 25.7 Rock Shelf, Pataha Creek, river mile 35.2 Old Bihmaier Dam, Bihmaier Gulch Creek, river mile 1.1 Steven's Ridge Culvert, Pataha Creek, river mile 43.8 Dry Pataha Dam, Dry Pataha Creek, river mile 0.4
Regulatory Actions
Update, implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.

Miscellaneous Studies
Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals to meet needs.
Identify specific stream fords that could be eliminated by installing bridges or culverts.
Identify number of water users and amount of water involved with 1913 Garfield County Adjudication
Review permitting and managed growth practices in lieu of future water needs, public health, and post-fire redevelopment activities (including identification of non-permitted diversions and discharges; permitted structures; growth management issues; water supply and public health issues)

Tucannon River Implementation Area Planning Objectives and Actions

Specific objectives for the Tucannon River Implementation Area are listed in Section 6.4. These are in addition to the Basin-wide objectives and actions described in Section 5. The objectives are categorized by water quantity, water quality, aquatic habitat, regulatory actions and miscellaneous studies.

Tucannon River Implementation Area Actions
Water Quantity Management
Implement instream flow monitoring through permanent and seasonal gauges on Tucannon River.
Characterize ground water conditions to determine if additional withdrawals from ground water (up to 3629 afy) is sustainable
Replace surface water withdrawals for agricultural irrigation with ground water sources if study determines withdrawal is sustainable and practicable; source substitution could be implemented during low flow periods or permanently where feasible.
Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals that could potentially replace surface water diversions.
Identify wetland storage projects
Explore opportunities for water right leases and/or acquisitions through the WDOE Trust Water Program and/or water banking.
Water Quality Management
Conduct a study to current condition and sources of water quality including: • Determining if the inputs of the Pataha River are impacting water quality in the Tucannon River. • Identifying sources of fecal coliform • Determining the natural temperature ranges for the Tucannon River • Collecting data in accordance with Ecology standards for use in developing state-required TMDLs
Implement the following strategies to reduce fecal coliform levels at mouth of Tucannon River: septic system repair and/or upgrade, livestock BMPs, regulation of point sources, restore riparian buffers, manage grazing in riparian areas
Implement the following strategies to reduce TSS levels by reducing the sediment load entering the River: conservation tillage, grassed waterways, sediment basins, improve riparian function, reduce erosion from public and private roads (via maintenance or non-dirt materials)
Identify opportunities for funding for landowners to reduce sediment from private roads
Continue ongoing strategies to reduce water temperatures: BMPs
Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: non-chemical weed control practices (mowing, etc) of ditches and ROWs, restore riparian areas, urban/rural education program, conservation tillage
Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: creation and maintenance of county ROW buffers, agricultural BMPs to buffer agricultural feeds next to roadways, conservation tillage, increase grassed waterways, buffers, strip cropping
Aquatic Habitat Enhancement
Prioritize funds for post-fire restoration (School Fire) on public lands
Implement aquatic habitat protection and restoration plans; including the following priority projects: 1. Sediment reduction 2. Enhancement of habitat in riparian zones for Fall Chinook/Steelhead

3. Control of noxious weeds 4. Planting of native vegetation 5. Hartsock Creek Retention Pond 6. School Fire Riparian Recovery 7. Tucannon Steelhead Captive Brood Program 8. Tucannon Spring Chinook Hatchery Supplementation
Restore areas of degraded riparian vegetation on private and public land through ongoing activities such as CREP and CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.
Develop a pilot project to restore areas of degraded riparian vegetation on private and public land through conservation easements with an early emphasis on the most degraded areas and provide education/outreach on the potential use of easements as a watershed tool
Work with public land and wildlife management agencies to maintain and enhance pristine and other areas of the headwaters, with specific focus on the post-School Fire recovery area, by applying BMPs.
Remove fish passage obstructions, including: Tucannon River, Starbuck Dam (RM 5.5) [improve function of existing ladder] Tucannon River, Irrigation Weir (RM 13.5) Tucannon River, Hatchery Dam (RM 38.4) Tucannon River, Curl Lake Weir (RM 43)
Continue to provide surface water diversions with effective fish screens and identify if additional screens are needed with the subbasin
Regulatory Actions
Establish minimum instream flows for Tucannon River at Lower Tucannon River and Marengo gauge sites.
Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.
Recommend to the state legislature to accommodate water spreading by existing water right holders
Recommend to the state legislature to change water right statutes to allow maintenance of original appropriation date for surface water diversions that are transferred to ground water
Miscellaneous Studies
Identify specific stream fords that could be eliminated by installing bridges or culverts. Pursue project funding.

Grande Ronde Implementation Area Planning Objectives and Actions

Specific objectives for the Grande Ronde Implementation Area are listed in Section 6.5. These are in addition to the Basin-wide objectives and actions described in Section 5. The objectives are categorized by water quantity, water quality, aquatic habitat, regulatory actions and miscellaneous studies.

Grande Ronde Implementation Area Actions
Installation of additional instream flow gauges with focus on perennial streams with potential fish habitat.
Continued instream flow monitoring at seasonal and permanent gauging locations.
Modify surface water diversions to meet NOAA fish passage standards where necessary
Continue installing water use meters to surface water and groundwater diversions
Ensure adequate water supply for irrigation by: upgrading low efficiency systems, changes in irrigation timing, storage for periods of low availability
Water Quality Management
Implement a regular water quality monitoring program that will identify contributions to high instream temperatures, fecal coliform and sediment delivery from tributaries
Continued water quality monitoring at existing locations.
Implement the following actions to reduce suspended sediments from tributary streams: no till, increase grassed waterways, buffers, strip cropping
Implement the following actions to reduce fecal coliform levels on the Grande Ronde: manure management, riparian enhancement, improve/encourage grazing management for operations adjacent to streams, septic system inventory / management/straight pipes, reduce or eliminate combined sewage overflows, urban sources, inventory / dye testing of septic systems adjacent to floodplains and waterways, other applicable BMPs

Aquatic Habitat Enhancement
Implement actions to reduce instream temperatures within Grande Ronde mainstem and tributaries
Develop aquatic habitat restoration and protection plans; including the following prioritized projects: Bull trout monitoring, Grande Ronde Supplementation Program Monitoring and Evaluation, Life Studies of Spring Chinook
Restore areas of degraded riparian area through CREP or permanent conservation easements
Address barriers to fish passage such as Improperly screened diversions and Inadequate culvert modifications
Improve degraded channel conditions where necessary
Regulatory Actions
Establish minimum instream flows
Miscellaneous Studies
Develop a more complete knowledge of land uses that impact water quality, water quantity, and aquatic habitat

Plan Implementation Considerations

Section 7 addresses overall implementation needs necessary for providing a solid foundation for individual actions. Implementation considerations for these actions include identifying the organizations that would have implementation responsibilities, implementation timeframe, cost of implementation, and potential sources of funding.

Plan Adoption Process and Resulting Obligations

The Watershed Management Act prescribes a specific process for adoption of a watershed plan, and voluntary acceptance of obligations under the plan (Section 90.82.130 RCW). This is a two-stage process. First, the Planning Unit considers the plan for approval, and individual members of the Planning Unit consider what actions they will commit to carrying out. Once this is completed, the plan is sent to the Boards of County Commissioners of Asotin, Columbia, Garfield and Whitman Counties for their consideration. If the Commissioners approve the plan, the voluntary commitments made by members of the Planning Unit become binding, recognizing funding and staffing limitations. More specific information is included in Section 7.2.

Grant Funding for Implementation Phase

In 2003 the Washington State Legislature amended the watershed planning grants program to provide Phase 4 grants to support implementation of watershed plans (Section 90.82.040 RCW). As an example of grant funding, the WRIA 35 Planning Unit is eligible for up to $100,000 per year in each of the first three years of implementation. Following this, $50,000 per year can be awarded in the fourth and fifth years of implementation. A match of ten percent is required, which can include either financial contributions or in-kind goods and services.

The Legislature also provided that the Planning Unit must complete a detailed implementation plan within one year of accepting the Phase 4 funding. Disbursements of Phase 4 funding for subsequent years is conditioned upon completion of the implementation plan. Specific details of implementation plan elements are provided in Section 7.3.

Overall Coordination of Plan Implementation Overall Coordination of Plan Implementation

The recommendations presented in this watershed plan span a range of natural resources, activities, and organizations. Recommendations are identified for county governments, public water systems, several state agencies, private industry, landowners and others. With a range of organizations involved, and an implementation period spanning many years, it will be important to put in place some mechanism for coordination and oversight.

The Planning Unit is encouraged to establish an Implementation Working Group (IWG) as a subcommittee to the larger Planning Unit. The purpose of the IWG is to coordinate implementation of the watershed plan along with the subbasin and Snake River salmon recovery plan as part of an integrated implementation approach.

Project funding requests that will be submitted to the Washington State Salmon Recovery Funding Board will need to go through a regional review and prioritization process led by the Snake River Regional Recovery Board. Under this process, project proponents propose projects that will go through a Planning Unit review committee (assumed IWG) and the Snake River regional review process before being submitted to the State for funding consideration. More details on IWG responsibilities will be developed during Phase 4.

Implementation Actions by Individual Organizations

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

Funding Strategy

Tables have been presented in earlier sections of this watershed plan that summarize implementation considerations. These tables include a preliminary estimate of the magnitude of costs and suggested time frame. A mix of potential funding sources has been identified for different activities in the plan.

Monitoring and Adaptive Management

Implementing an adaptive management program for the watershed plan is an important part of plan implementation. Three general components of an adaptive management program include validation, implementation and effectiveness monitoring,

Adaptive Management Implementation Considerations

General recommendations to consider during plan implementation include:

- Build upon existing monitoring efforts and use the Technical Work Group or other group as a coordinating body to fill data gaps;
- Adopt monitoring protocols to provide a consistent means for comparing information across geographical and temporal scales;
- Continue efforts to develop the basin-wide database with a universal interface from which to share the database, and share data; and
- Conduct all three types of monitoring (implementation, effectiveness, and validation).

Public Involvement for Plan Implementation

As the watershed plan is implemented, continued stakeholder involvement and public communications, like those that have occurred during plan development, will be necessary to provide final shaping, support and effective execution of recommended management strategies and actions. Section 7.8 outlines recommendations on public participation and ongoing education.

Funding for Public Involvement

A dedicated source of funding will be needed to support a public involvement program during implementation. This could be funded through a percent of future project and planning funding that comes into the Middle Snake region (e.g., a portion of project administration funding), and/or through a dedicated grant funding source. A funding strategy will need to be developed for sustaining public involvement during plan implementation.

Future Plan Updates

The actions recommended in this plan were devised given current understanding of conditions as they exist at the time the plan was developed. Over the next several years, new data will be collected, conditions may change, regulatory and funding programs may change, and new projects affecting water resources may be proposed within the region. In addition, the implementation process may result in some modifications of the recommended actions as they are actually carried out.

To accommodate this ongoing evolution of information and events in the region, it is recommended that the watershed plan be reviewed from time to time to determine whether an update is needed. This review should be carried out by the Planning Unit, as one of its implementation responsibilities. The first review should occur within three years of the date this plan is approved by the Boards of County Commissioners for the Initiating Governments.

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6 Implementation Area Strategies

7 Plan Implementation Considerations

References

Tables

Exhibits

Appendices

Participants

From the inception of Middle Snake watershed planning in 2002, there have been nearly dozens of meetings attended by local and regional stakeholders and agency representatives. The following is a list of Middle Snake watershed planning participants.

Asotin County PUD-Lead Agency

- Tim Simpson- Asotin County PUD General Manager
- Don Nuxoll- Asotin County PUD
- Brad Johnson- Middle Snake Watershed Planning Director (formerly of Asotin County Conservation District)

Planning Unit

- Ben Floyd- HDR
- Bill Neve- Department of Ecology
- Brian Burns- Tri-State Steelheaders
- Butch Aiken- Asotin County DEM
- Butch Klaveano- Garfield County
- Carmen Andonaegui- WDFW
- Caty Clifton- Umatilla National Forest
- Clay Barr- Pomeroy Mayor, City of Pomeroy
- Dan & Ann Chapman-Landowner
- Dan Clark- Landowner
- Dan McKinley- Land manager Columbia County
- Dave Karl- Landowner
- Dean Burton- Landowner
- Debbie Moberg- Landowner
- Del Groat- US Forest Service, Pomeroy Ranger District
- Dick Dowdy- Landowner
- Dick Ducharme- Columbia County
- Dick Jones- Columbia County Commissioner
- Dick Rubenser- Columbia County
- Don Howard- Landowner, Columbia County
- Doug Mattoon- Asotin County Commissioner, Dist. 1
- Duane Bartels- Pomeroy Conservation District
- Emmit E. Taylor, Jr.- Nez Perce Tribe
- Eric Meyers- Citizen Columbia County, Snake river Salmon Recovery Board Member
- Gordon Reed- Citizen Representative- Snake River Salmon Recovery Board Member
- Grant Low- Town of Starbuck
- Harold Thompson- Landowner
- Janne Kaje- Steward and Associates
- Jason Flory- USFWS
- Jed Volkman- Confederate Tribes of the Umatilla Indian Reservation (CTUR)

- Jerry Chavez- Tri-State Steelheader

Participants (continued)

- Jim Pacheco- Wa. Dept. Fish & Wildlife
- Jim Peterson- Landowner
- Joe Lemire- Landowner
- John Koreny- HDR
- John Smith- City of Clarkston
- Jon Kincaid- Landowner
- Jory Oppenheimer- HDR
- Juli Post- Salmon Recovery Board
- Karst Riggers- Asotin County Planner
- Keith Berglund- Wheat Growers
- Kimberly Morse- Whitman Conservation District (WCD)
- Larry Hooker- Landowner
- Les Wigen- Whitman County
- Marie Gormsen- Pomeroy Conservation District
- Mark Grandstaff- WDFW
- Mark Heistiman- Landowner
- Marvin Jackson- Port of Clarkston Commissioner
- Megan Stewart- Asotin County Conservation District
- Mike Selivanoff- Landowner
- Mimi Wainwright- Ecoloby
- Paul Beaudoin- Pomeroy Conservation District
- Paul Carter- WSU
- Paul Kraynak- Nez Perce Tribe
- Randy Baldree- Landowner
- Richanrd Hastings- Pomeroy Conservation District
- Rick Turner- Landowner Columbia County
- Rob Buchert- Palouse Conservation District
- Ron Ruddell- Asotin County PUD
- Ronan Igloria- HDR/EES
- Shana Kozusko- DFW
- Skip Mean- Landowner Columbia County
- Sondra Collins- Riparian Ecologist/ ECOS USA
- Stacia Peterson- Walla Walla Ranger Station
- Stan Wilson- Asotin County Sportsmen Association
- Steve Martin- Snake River Salmon Board
- Terra Hegy- WDFW
- Terry Bruegan- Columbia Conservation District
- Terry Shepherd- HDR
- Tom Schim- WDFW

Abbreviations and Acronyms

ACOE	Army Corps of Engineers (Federal)
AFY	Acre-Foot per Year
APA	Aquifer Protection Areas
ASR	Aquifer Storage and Recovery
BMP	Best Management Practice
BPA	Bonneville Power Administration
CD	Conservation District
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (Federal)
CFS	Cubic Foot per Second
CREP	Conservation Reserve Enhancement Program (Federal)
CRP	Conservation Reserve Program (Federal)
CWA	Clean Water Act (Federal)
DEM	Department of Emergency Management
DIP	Detailed Implementation Plan
DNR	Department of Natural Resources (Washington State)
DO	Dissolved Oxygen
DOE / Ecology	Department of Ecology (Washington State)
DOH	Department of Health (Washington State)
EDT	Ecosystem Diagnosis and Treatment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act (Federal)
FERC	Federal Energy Regulatory Commission
GMA	Growth Management Act (Washington State)
GPM	Gallons per Minute
GWMA	Groundwater Management Area
GWMP	Groundwater Management Program
HCP	Habitat Conservation Plan
HIP	Habitat Incentives Program
IA	Implementation Area
IFIM	Instream Flow Incremental Methodology
IG	Initiating Government
IWG	Implementation Working Group
LFA	Limiting Factors Analysis
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
MIF	Minimum Instream Flow
MOA	Memorandum of Agreement
MSA	Major Spawning Area
mSA	Minor Spawning Area
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System

Abbreviations and Acronyms

NPPC	Northwest Power Planning Council
NRCS	Natural Resource Conservation Service (Federal)
PSA	Public Service Announcement
PUD	Public Utility District
PWS	Public Water System
Qa	Annual Volume of Water
Qi	Instantaneous Rate of Flow
RCRA	Resource Conservation and Recovery Act (Federal)
RCW	Revised Code of Washington
RM	River Mile
SDWA	Safe Drinking Water Act (Federal)
SEPA	State Environmental Policy Act (Washington State)
SMA	Shoreline Management Act (Washington State)
SRA	Salmon Recovery Act (RCW 70.46; ESHB 2496)
SRSRB	Snake River Salmon Recovery Board
SRSRP	Snake River Salmon Recovery Plan
SSA	Sole Source Aquifer
SWSL	Surface Water Source Limitation
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
UIC	Underground Injection Control Program (Washington State)
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WMA	Watershed Management Act (RCW 90.82; ESHB 2514) (Washington State)
WQMA	Water Quality Management Act
WRATS	Water Rights Application Tracking System (Washington State)
WRIA 35	Water Resource Inventory Area (Middle Snake)
WRP	Wetlands Reserve Program (Federal)
WSCC	Washington State Conservation Commission
WSDA	Washington State Department of Agriculture
WSU	Washington State University
WUA	Weighted Usable Area

Section 1
Introduction and Background

Watershed planning provides a method to help balance competing demands upon water resources. Given a limited resource and a range of potentially competing demands for water, it has historically been difficult for citizens, businesses and public agencies to make water-resource management decisions without some controversy. The State of Washington's Watershed Planning program offers a tool that is designed to allow for local guidance in identifying, prioritizing and developing solutions to water resource management issues within the state's watersheds. This document presents the local Watershed Management Plan for Water Resource Inventory Area (WRIA) 35 along the Middle Snake River.

1.1 Overview of Watershed Planning

1.1.1 Planning Objectives & Scope

Watershed planning in WRIA 35 provides a method to help achieve a balance among competing water resource demands. Water demands for commercial, industrial, residential and agricultural activities (e.g. out of stream uses) have to be balanced with instream fish habitat needs. Demands such as irrigated agriculture provide a significant economic base for the WRIA. Critical habitat for fish species listed under the federal Endangered Species Act (ESA) as well as a diversity of non-listed fish and wildlife are also dependent upon water resources. The Basin's surface water resources also offer recreational opportunities and natural beauty for residents and visitors.

1.1.2 Legal Basis for Watershed Planning

In 1998, the Washington State Legislature passed the Watershed Management Act (Chapter 90.82 RCW; ESHB 2514) to provide a framework for citizens, interest groups, and government organizations to join together to develop a management plan for water resources in each of the State's major watersheds as described in Chapter 173-200 WAC. The Watershed Management Act (WMA) enables, but does not require, local groups to form for the purpose of conducting watershed planning. WMA identifies a group of "initiating governments" that are empowered to select a lead agency, apply for grant funding, determine the overall scope of planning, and convene a "Planning Unit." The initiating governments include all counties within the WRIA, the government of the largest city or town (if applicable), the water supply utility obtaining the largest quantity of water from the WRIA, and Indian tribes with reservation lands within the management area. Funding is provided through the WMA for areas in Washington State that wish to undertake planning and specifies ground rules for use of the funding. Initiating governments for WRIA 35 are discussed in Section 2, along with additional Planning Unit representation, as described below.

The WMA identifies the Planning Unit as the group that develops and initially approves the watershed plan. It calls for either a consensus approval by all members of the Planning Unit, or a consensus of the governmental members and a majority vote by remaining members of the

Planning Unit. Following approval by the Planning Unit, and a requisite public meeting held by each county legislative authority, the WMA calls for a joint session of the legislative bodies of all counties in the watershed to consider the plan. The authority of the county legislative body(s) is limited to approval or rejection of the watershed plan. If the county legislative body(s) reject the plan as submitted, they can send the plan back to the Planning Unit with recommended changes, but are prohibited from making changes to the plan themselves. Once the plan has been approved by both the Planning Unit and joint session of county legislative bodies, it requires counties and State agencies to implement plan elements which they agreed to be obligated to upon entering the planning process.

1.2 Description of WRIA 35 Planning Area

1.2.1 Planning Area Boundaries

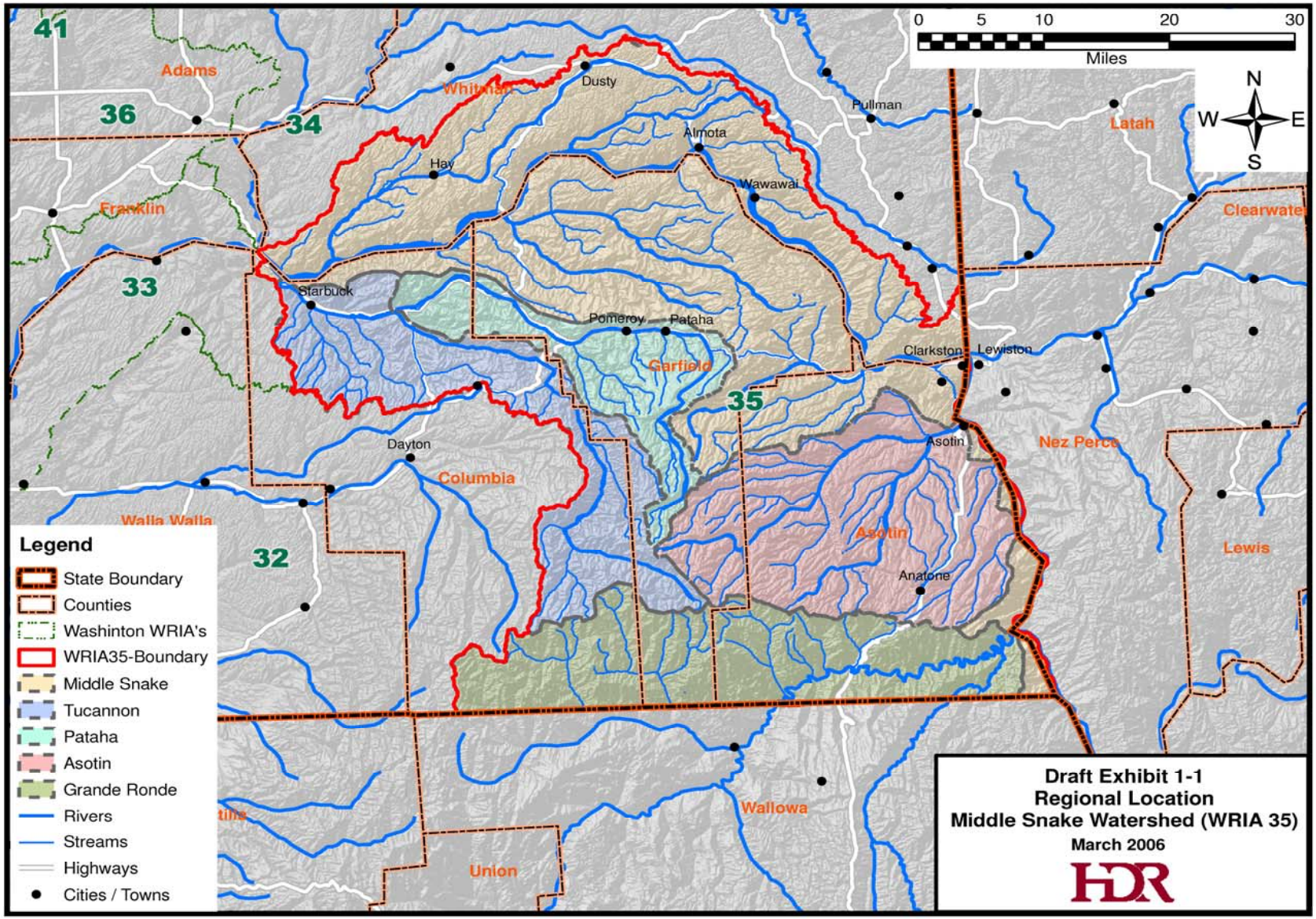
The Middle Snake River Watershed (WRIA 35) occupies approximately 2,250 square miles in southeastern Washington along the Idaho border to the east and Oregon border to the south. The Palouse Watershed (WRIA 34) lies to the north, and the Walla Walla Watershed (WRIA 32) and Lower Snake Watershed (WRIA 33) lie to the west. Exhibit 1-1 shows the regional location of the WRIA 35. The Middle Snake Watershed encompasses portions of Asotin, Whitman, Garfield, and Columbia Counties within Washington. Diamond Peak, located in the headwaters of the Tucannon River, is the highest point in the basin with an elevation of 6,380 feet, while the confluence of the Snake and Tucannon Rivers is the lowest point at approximately 540 feet. The City of Clarkston and towns of Starbuck, Pomeroy, and Asotin are also located within WRIA 35.

The Middle Snake River Basin is within the Columbia Basin and Blue Mountain ecoregions and is nearly 1.5 million acres in size. Land use is approximately 50 percent rangeland, 33 percent agriculture, 15 percent forestland and 1 percent urban. The population is less than approximately 25,000. Population growth projections for the area are expected to reach 33,000 by 2020, which is low given the extent of the geographic area, yet nonetheless represents a future need.

1.2.2 Planning Topic Opportunities

Despite the limited population, previous studies in the basin have identified both water quantity issues with stream flow limited streams (e.g. in the Tucannon River and ground water in the Clarkston area), and water quality issues to be of concern in the basin. Based on the available surface water quality data, improvements can be made in reducing elevated temperatures and sediment in Pataha Creek, the Tucannon River and Snake River; while elevated fecal coliform levels have been identified as a concern in Asotin and Pataha Creeks.

The WRIA 35 planning area includes federally-listed Endangered Species, including Fall Chinook, Spring/Summer Chinook, Steelhead and Bull Trout. Known and presumed presence (which includes spawning, rearing and migration habitat) for key species are indicated in the Table 1-1.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34
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Adams
Franklin
Whitman
Dusty
Pullman
Latah
Clearwater
Almota
Hay
Wawawai
Starbuck
Pomeroy
Pataha
Garfield
Clarkston
Lewiston
Asotin
Nez Perce
Dayton
Columbia
Walla Walla
Asotin
Anatone
Lewis
Wallowa
Union
Legend
State Boundary
Counties
Washinton WRIA's
WRIA35-Boundary
Middle Snake
Tucannon
Pataha
Asotin
Grande Ronde
Rivers
Streams
Highways
Cities / Towns
Draft Exhibit 1-1
Regional Location
Middle Snake Watershed (WRIA 35)
March 2006
HDR

Table 1-1 Listed Fish Species in WRIA 35			
Species	**Federal Status**	**State Status**	**Known and presumed presence within WRIA 35**
Snake River Spring/Summer Chinook Salmon	Threatened (Listed April 1992)	Species of concern	Tucannon River, Asotin Creek
Snake River Fall Chinook Salmon	Threatened (Listed April 1992)	Species of concern	Mainstem Snake River and the Tenmile-Couse, Tucannon River, Asotin Creek, Alpowa-Deadman, and Grande Ronde subbasins.
Steelhead Trout	Threatened (Listed June 1998)	Species of concern	Tucannon River (includes Penawawa, Alkali Flat, Deadman, and Meadow creeks, Palouse River) Asotin Creek (Almota, Tenmile, Steptoe, Couse, Alpowa and Wawawai creeks)
Bull Trout	Threatened (Listed June 1998)	Species of concern	Grande Ronde, Asotin Creek, Tucannon River, mainstem Snake River
(SRSRP Draft June 2005)			

1.2.3 WRIA and Implementation Areas

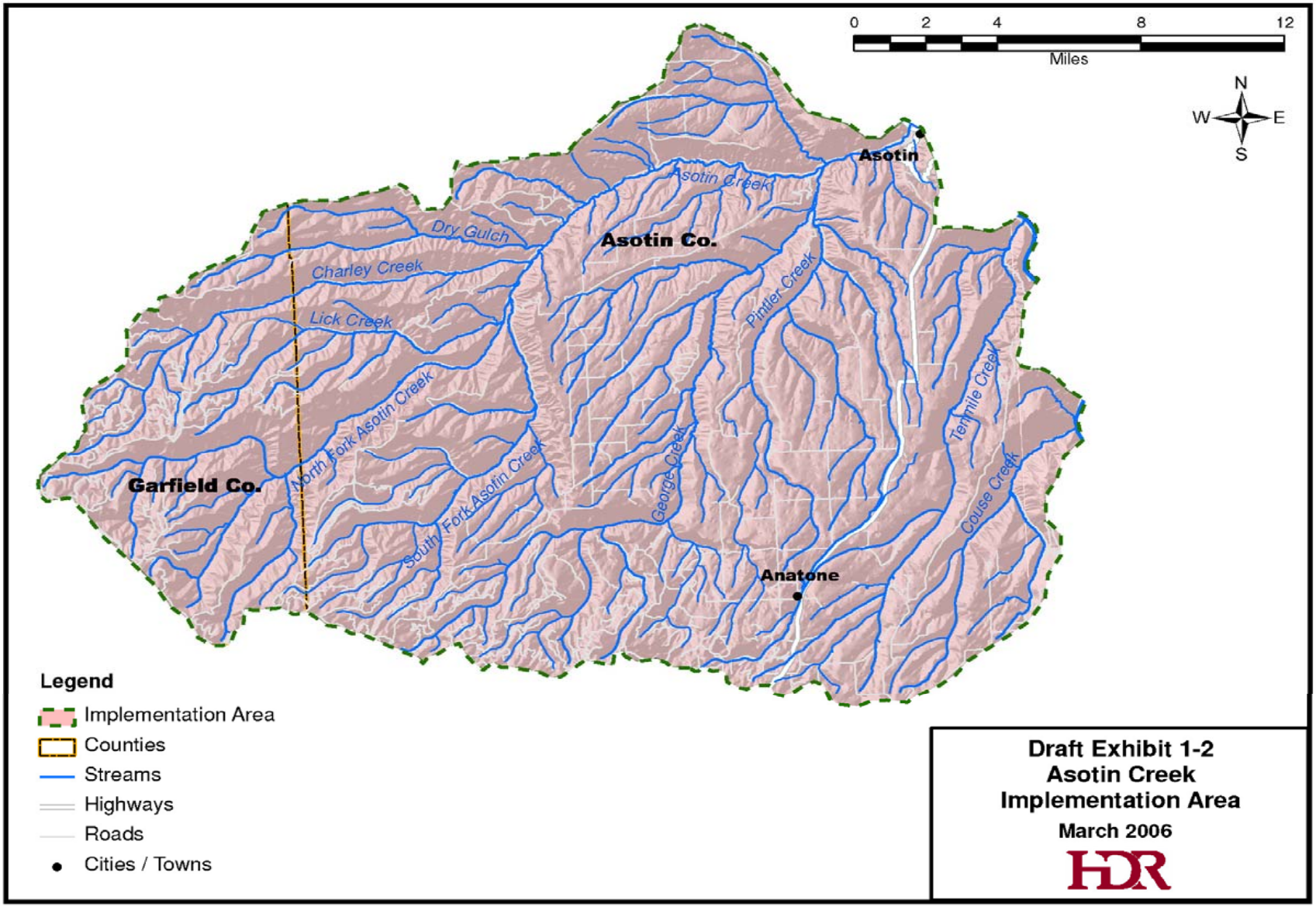
For the purposes of watershed management, the following five distinct Implementation Areas make up WRIA 35:

- Asotin Creek Implementation Area
- Middle Snake River Implementation Area
- Pataha Creek Implementation Area
- Tucannon River Implementation Area
- Grande Ronde Subbasin Implementation Area

Implementation Areas were formed based on variations in land use, habitat, and hydrologic characteristics within the WRIA. See the Level I Technical Assessment (HDR-EES 2005) and Grande Ronde Addendum (HDR-EES 2005) for more complete implementation area descriptions.

Asotin Creek Implementation Area

The Asotin Creek Implementation Area is located in Asotin and Garfield Counties as shown in Exhibit 1-2. The major stream reaches located within this area include Asotin Creek, Tenmile Creek, and Couse Creek. Asotin Creek is a third order tributary to the Snake River with its headwaters originating in the Blue Mountains, continuing east into the Snake River at Asotin,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Miles
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Asotin
Asotin Creek
Asotin Co.
Dry Gulch
Charley Creek
Lick Creek
Pintler Creek
Tenmile Creek
North Fork Asotin Creek
South Fork Asotin Creek
George Creek
Couse Creek
Garfield Co.
Anatone
Legend
Implementation Area
Counties
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 1-2
Asotin Creek
Implementation Area
March 2006
HDR

Washington. Asotin Creek has two major drainages, the mainstem and George Creek. The mainstem drains 119,000 acres and flows into the Snake River at the City of Asotin. Major tributaries to the mainstem include Charley Creek, North Fork of Asotin Creek, South Fork of Asotin Creek, and Lick Creek. George Creek drains 89,000 acres and its major tributaries include Pintler Creek, Nims Gulch, Ayers Gulch, Kelly Creek, Rockpile Creek, and Coombs Canyon. Tenmile and Couse Creeks both drain into the Snake River south of Asotin. Pasture and rangeland, cropland, and forestland are the predominant land uses. The City of Asotin is the primary population center.

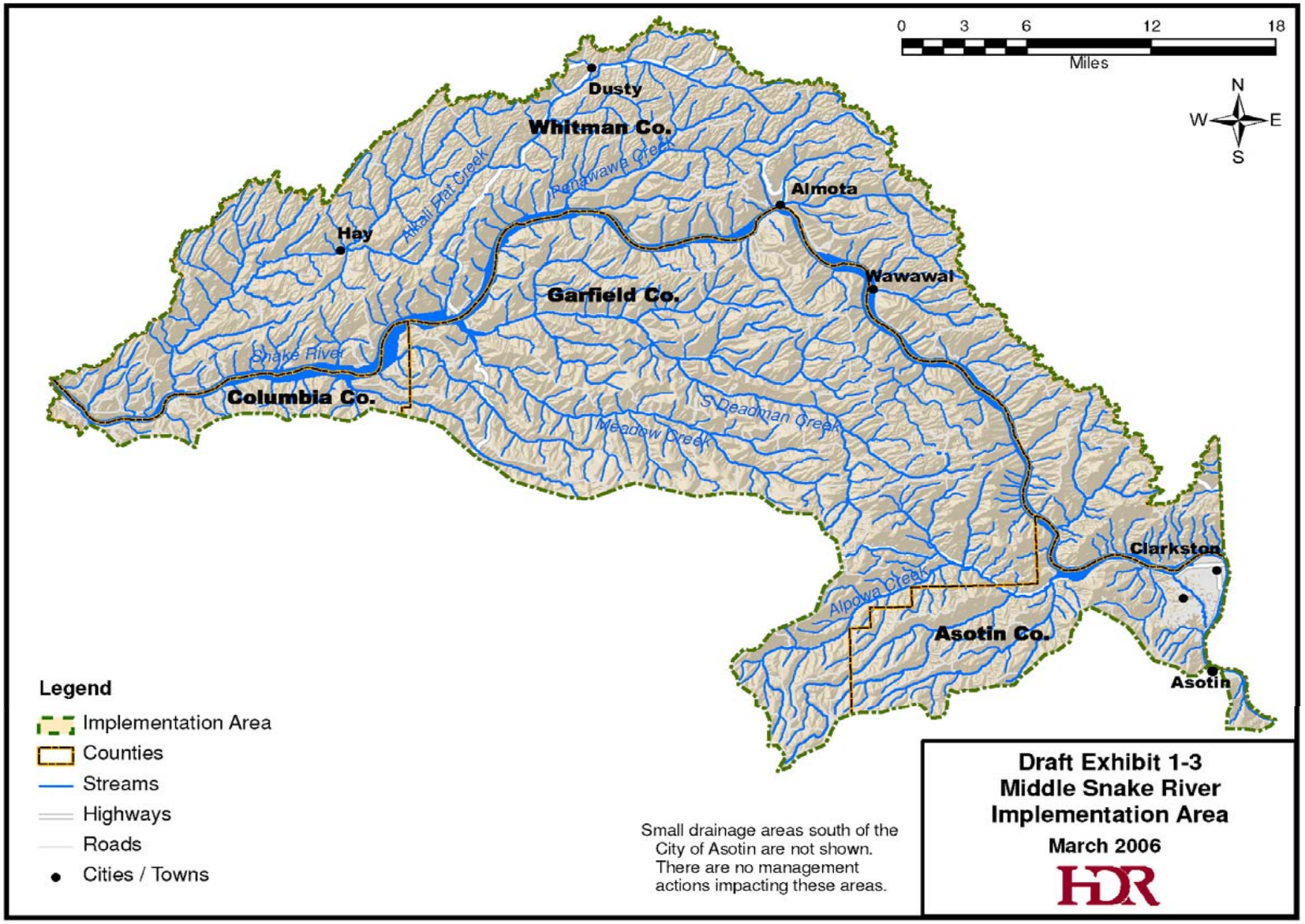
The Asotin Creek Implementation Area is part of the ceded lands of the Nez Perce Tribe. In the Treaty of 1855, the Nez Perce retained total fishing rights on all streams and rivers within the boundaries of the original 13.4 million acre reservation that extended outward to "all usual and accustomed places," including the mainstem Columbia River. Tribal ancestors maintained these rights because the once abundant salmon runs were vital to their way of life and future generations.

Middle Snake River Implementation Area

The Middle Snake River implementation area is composed of portions of Columbia, Whitman, Garfield and Asotin counties as shown in Exhibit 1-3. The Middle Snake lies within a canyon cut through the Columbia Plateau. Several small tributaries with perennial water flow are included in this subbasin. The streams that drain the north side of the Snake River in Whitman County cover approximately 449 square miles (287,500 acres) and include Alkali Flat Creek, Penawawa, Almota, Wawawai and Steptoe Canyon creeks. The streams that drain from the south, primarily in Garfield County cover approximately 563 square miles (360,400 acres) and include Alpowa, Deadman and Meadow Creeks. The two dams on the Middle Snake River include Lower Granite (RM42) and Little Goose Dams (RM70). Both of these dams are 'run of the river' facilities, in that they have limited additional storage capacity in their reservoirs and pass water through the dam at about the same rate as it enters the reservoir. Only a relatively small amount of runoff occurs along the Middle Snake River downstream of the Clearwater River confluence with contribution primarily from the Tucannon River. This implementation area includes the City of Clarkston, the largest population center in the watershed. The Lewiston-Clarkston area represents the majority of industrial, commercial, and residential development in the watershed. There is minimal other development in the implementation area. Agriculture in the implementation area is dominated by non-irrigated farming in the uplands, irrigated farming in the lower valleys, and cattle ranching. Little forestry activity occurs in this area.

Pataha Creek Implementation Area

The Pataha Creek implementation area is located mainly in Garfield County and partially in Columbia County as shown in Exhibit 1-4. Pataha Creek, the major stream in this area, drains into the Tucannon River at River Mile 11.2. Although in other studies it has been included as part of the Tucannon River sub-basin, it is included in this plan as a separate implementation area because of unique characteristics that differentiate it from the rest of the Tucannon sub-basin. Pataha Creek drains 114,166 acres (185 square miles). Major tributaries of Pataha Creek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Miles
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W E
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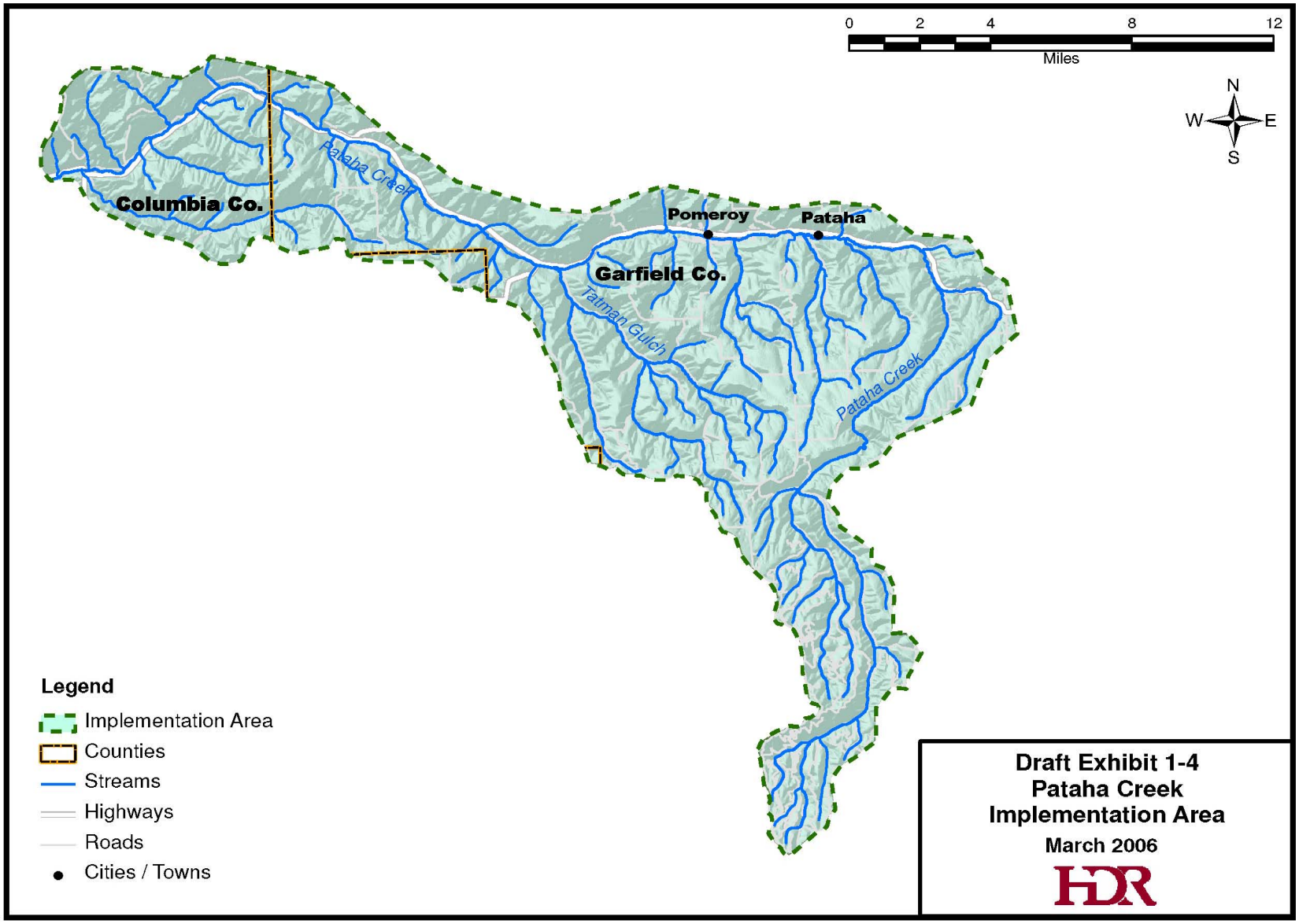
Dusty
Whitman Co.
Alkali Flat Creek
Patawawa Creek
Almota
Hay
Wawawai
Garfield Co.
Snake River
Columbia Co.
S Deadman Creek
Meadow Creek
Clarkston
Alpowa Creek
Asotin Co.
Asotin
Legend
Implementation Area
Counties
Streams
Highways
Roads
Cities / Towns
Small drainage areas south of the City of Asotin are not shown. There are no management actions impacting these areas.
Draft Exhibit 1-3
Middle Snake River
Implementation Area
March 2006
HDR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Columbia Co.
Pataha Creek
Pomeroy
Pataha
Garfield Co.
Tatman Gulch
Pataha Creek
Legend
Implementation Area
Counties
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 1-4
Pataha Creek
Implementation Area
March 2006
HDR

are seasonal streams that include Dry Pataha Creek, Sweeney Gulch, Balmaier Gulch, Linville Creek, Tatman Gulch, and Dry Hollow. The primary land use is agriculture, mainly non-irrigated cropland farming and livestock production. The primary city is the City of Pomeroy, located on Pataha Creek in the northeastern portion of the sub-basin.

Tucannon River Implementation Area

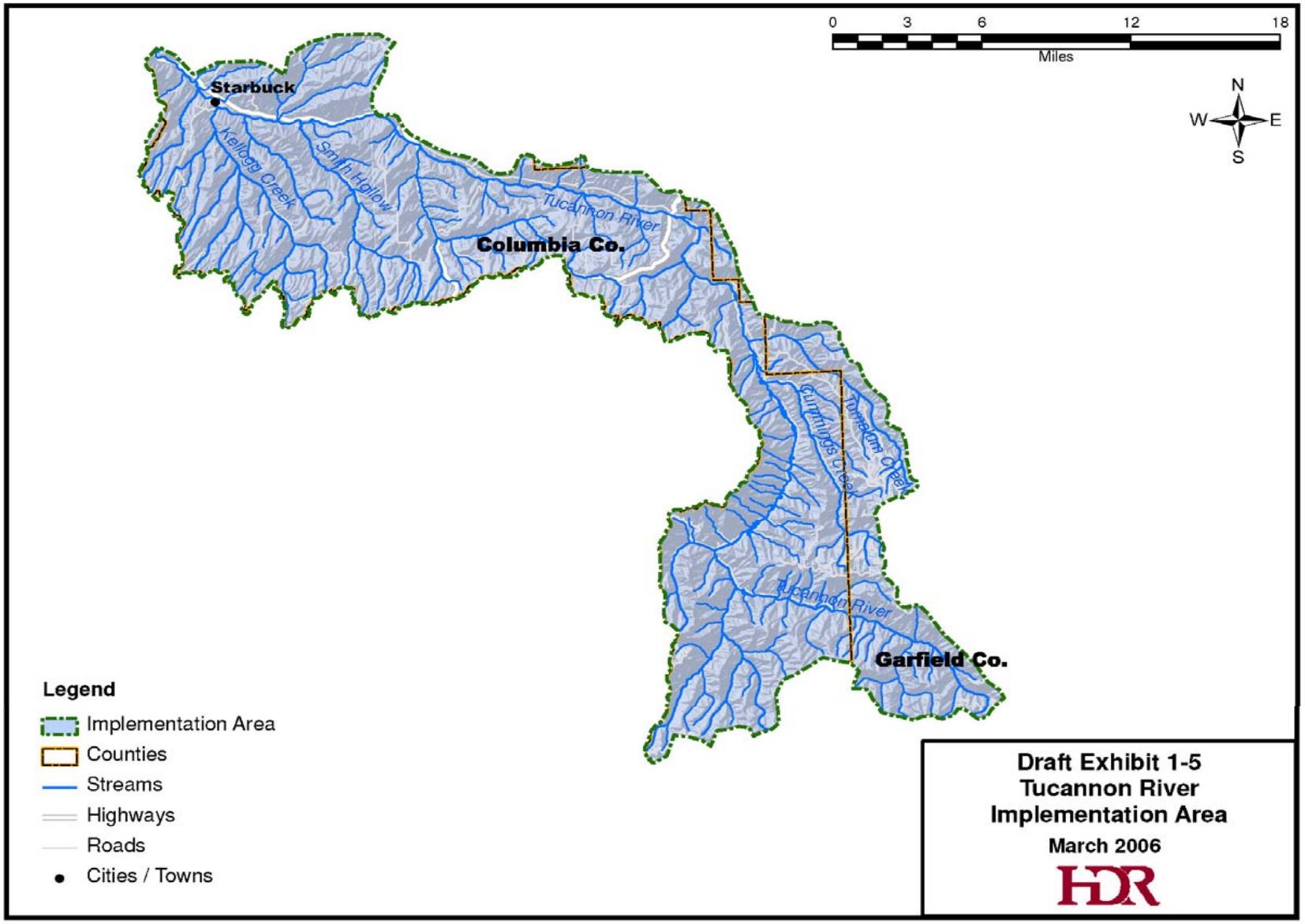
The Tucannon River implementation area is located within Columbia and Garfield counties as shown in Exhibit 1-5. The Tucannon River has two major drainages, the mainstem and Pataha Creek. The mainstem drains 207,734 acres (318 square miles) and flows into the Snake River at RM 62.2, three miles upstream of Lyons Ferry State Park, near the mouth of the Palouse River and 20 miles upstream of the Lower Monumental Dam. Major tributaries to the mainstem Tucannon (besides Pataha Creek) include Willow Creek, Kellogg Creek, Cummings Creek, Little Tucannon River, Panjab Creek, Sheep Creek, and Bear Creek.

The Tucannon River valley has a long history of Native American usage and homesteading. The Tucannon River Subbasin is within the treaty territory of the Nez Perce Tribe and is protected as a usual and accustomed area via the treaty of 1855. The Nez Perce Tribe maintains a co-management authority with the State of Washington and the United States Government over the tribes' treaty reserved resources. The Tucannon River Subbasin is also part of the usual and accustomed area for the Confederated Tribes of the Umatilla Indian Reservation. Currently, the Tucannon River Subbasin provides hunting, fishing and gathering opportunities for tribal members

The major land uses in the Tucannon River watershed are related to agricultural purposes (SCS 1991), with 75 percent of the subbasin in private ownership, primarily in the lower reaches. Crop, forest, rangeland, pasture, and hay comprise over 90 percent of the watershed, with grazed rangeland being the majority of the land use. Dry and irrigated cropland is used to produce winter wheat, barley, peas, and bluegrass. Significant areas of the mid-reaches of the river are managed by the Washington Department of Fish and Wildlife (WDFW). The Tucannon River drains the Blue Mountains in its headwaters where most of the upper third of the implementation area is forest covered and managed by the U.S. Forest Service (USFS). The Tucannon River sub-basin has a significant elevation change ranging from 540 feet at the confluence of the Tucannon and Snake Rivers to 6,400 feet at Oregon Butte in the Wenaha-Tucannon Wilderness located in the Umatilla National Forest. The steep topography limits cultivation to the non-forested land with slopes of 45 percent in the middle to lower portions of the subbasin.

Grande Ronde Subbasin Implementation Area

The entire Grande Ronde subbasin encompasses an area of about 4,000 square miles in northeast Oregon and southeast Washington and drains 341 square miles of southeast Washington as shown in Exhibit 1-6. The portion of the implementation area for WRIA 35 includes portions of Asotin, Columbia, and Garfield counties. The Grande Ronde River begins in the Blue Mountains near the Anthony Lakes recreation area and it crosses into Washington at RM 38.7 before joining the Snake River at RM 169. The primary Grande Ronde River tributary located within Washington is Joseph Creek. Joseph Creek flows in a general northerly direction and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Starbuck
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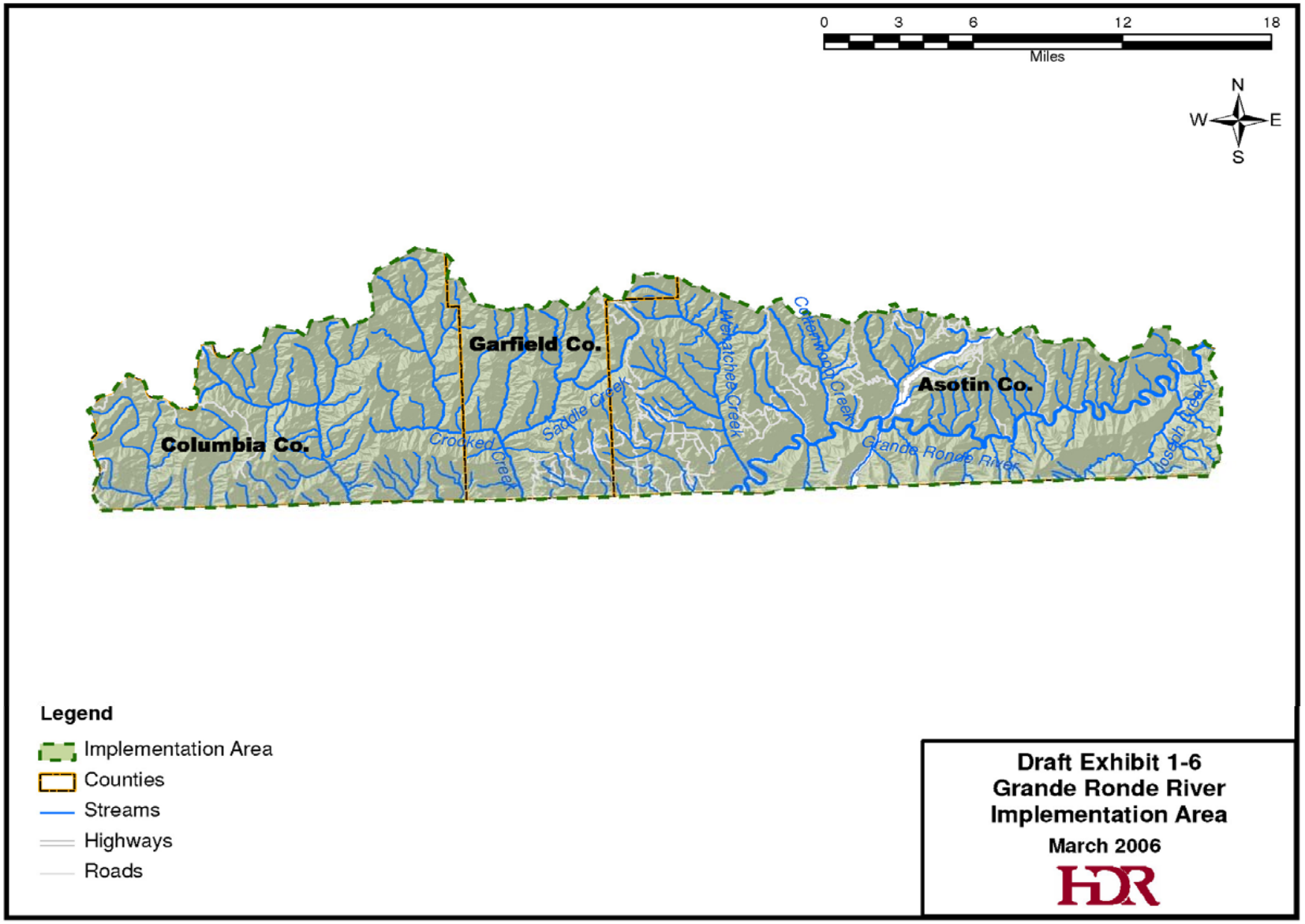
Smith Hollow
Tucannon River
Columbia Co.
Cummings Creek
Turnbow Creek
Tucannon River
Garfield Co.
Legend
Implementation Area
Counties
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 1-5
Tucannon River
Implementation Area
March 2006
HDR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Miles
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Garfield Co.
Columbia Co.
Asotin Co.
Crocked Creek
Saddle Creek
Wenatchee Creek
Cottonwood Creek
Grande Ronde River
Joseph Creek
Legend
Implementation Area
Counties
Streams
Highways
Roads
Draft Exhibit 1-6
Grande Ronde River
Implementation Area
March 2006
HDR

enters the Grande Ronde River at RM 4.3. The other major tributaries are located in Oregon. Peaks in the Wallowa Mountains approach 10,000 ft. and serve as the source of many of the Grande Ronde's tributary streams. The Blue Mountains reach elevations of 7,700 ft. and are the source of the Grande Ronde River and other tributary streams. There are no urban centers within the implementation area; human water consumption is assumed to be for rural domestic, agricultural uses, and wildlife management (Personal Communication, Dave Karl, WDFW, January 2006).

The Nez Perce Tribe is responsible for managing, protecting, and enhancing treaty fish and wildlife resources and habitats for present and future generations in the Grande Ronde River subbasin. The Nez Perce Tribe individually and/or jointly implements restoration and mitigation activities throughout their areas of interest and influence.

1.3 Relationship to Other Water Resource Programs and Plans

In virtually every basin around the State, a variety of regulatory programs, ongoing water resource management activities, and past or ongoing studies must be factored into watershed planning. A watershed plan under the WMA does not supersede other federal, state, or local requirements, but rather provides a framework for state, local, and even federal agencies to modify and coordinate existing or pending actions to reflect documented findings and local management direction in each watershed. If there is clear definition and broad support of planning recommendations, state and federal agencies may view the watershed plan as an expression of the public interest, lending significant credibility and support for consistent and complementary agency actions. For example, forming water quality improvement strategies in line with State Total Maximum Daily Load (TMDL) requirements can improve coordination between local initiatives and state and federal requirements. In addition, coordinating between regional strategies and actions developed through the Snake River Salmon Recovery Board's planning process (see Section 1.4.1) and local watershed plans can enhance opportunities to leverage funding for shared priorities. Establishing similar formal and informal linkages between the watershed planning process and other programs can be valuable in coordinating planning and management.

Table 1-2 lists a variety of programs at the local, tribal, state, and federal levels that are relevant to watershed planning within the WRIA. A few of the most important are also discussed briefly below. In some cases, programs may be viewed as a direct input to watershed planning, such as the parameters established by county or city land use planning documents. In other cases, existing programs may constrain available options for watershed management, or provide valuable data sources. In the long-term, the planning unit may wish to consider how implementation of the watershed plan can dovetail with other planning activities that are funded as part of routine government operations.

Table 1-2
Relationship of Existing Programs to Watershed Planning

Government Level	Programs	Relationship to Watershed Planning			
		Data Availability	Constraint on Mgmt Options	Potential Funding Sources	Implementation Tools
Local	County-wide Planning Policies				X
	Comprehensive Plans	X			X
	Drinking Water Source Protection Plans			X	X
	Shoreline Master Plans				X
	Salmon Recovery Plans/Documents	X	X		X
	Nonpoint Source Control Plans	X		X	X
	Stormwater Plans	X		X	X
	Onsite Septic System Inventory	X			
	Critical Areas Ordinance				X
	Water System Plans	X			X
	Water Conservation Plans				X
	Wastewater Plan	X		X	X
	Groundwater Management Plans	X			X
Tribal	Fishing Rights		X		
	Reserved Water Rights		X		
	Hatchery Plans				X
	Local Government Planning Functions	(See Local)			X
State	Water Rights Records	X	X		
	Instream Flow Regulations/Studies	X	X		
	Salmon Recovery Plans	X	X	X	X
	Wastewater Permit Life Cycle System	X	X		X
	TMDL Studies/Water Quality Plans	X	X		X
	WQMA Needs Assessment	X			
	Designated Use Regulations	X			X
	Water Quality Program	X		X	X
	Drinking Water Grants/Loans			X	X
	Water Quality Grants/Loans			X	X

Table 1-2 (continued)

Government Level	Program	Relationship to Watershed Planning			
		Data Availability	Constraint on Mgmt Options	Potential Funding Sources	Implementation Tools
State (cont.)	Forest Practices Watershed Analysis	X	X		
	Limiting Factors Analysis (2496)	X	X		
	Hatchery Plans				X
	DOT Fish Passage Grant Program	X	X	X	X
	Water Resources Program	X		X	X
	Salmon Recovery Planning	X		X	X
Regional/ Federal (BPA/NPPC; NOAA; Fisheries; USFWS; Reclamation; ACOE; FERC	ESA Listings/ Documentation	X	X		
	Irrigation Projects	X	X		
	Flood Control	X	X	X	X
	Wetlands		X		
	Hydropower	X	X		
	Subbasin Planning	X			X
	Salmon Recovery Planning	X		X	X

1.3.1 Salmon Recovery and Subbasin Plans

WRIA 35 watershed planning efforts are being closely coordinated with state-sponsored salmon recovery planning for the Snake River Basin and BPA/Northwest Power Planning Council (NPPC)-sponsored subbasin planning efforts within the WRIA.

The recovery strategy and associated actions developed as part of the draft and final Snake River Region Salmon Recovery Plan is the habitat component of this watershed plan along with subbasin plans (SRSRB 2005). The development of State and federal recovery plans has been anticipated, tracked, and integrated into the watershed planning process in the assessment, plan development and plan implementation stages.

Snake River Salmon Recovery Planning

The Washington State Legislature passed the Salmon Recovery Act (SRA; RCW 70.46; ESHB 2496), during the same session as the WMA. The 1999 Statewide Strategy to Recover Salmon, developed under the SRA, identified and funded six salmon recovery regions across the state for the purpose of developing recovery plans.

The Salmon Recovery Funding Board funded six regional efforts to develop recovery plans. Each group coordinated a multitude of plans across watersheds into a regional plan, and helped connect local social, cultural, and economic needs and desires with science and ESA goals. "Lead Entities" were organized as precursors to regional recovery organizations. The Lead Entities are locally-based committees reliant upon citizen volunteers to provide a framework for restoration of salmon habitat; the Snake River Lead Entity developed habitat protection and restoration strategies in 1999 that form the basis for the recovery plan. For the Snake River region, the Lead Entity currently is the Asotin County Conservation District. However, it is anticipated that in the future, the SRSRB will become the Lead Entity (SRSRB, 2005).

The Snake River Salmon Recovery Board (SRSRB) is responsible for addressing SRA issues in the Snake River Basin, which includes WRIA 35. The SRSRB released a draft recovery plan in 2005 that is consistent with the State Model for Recovery Plans. The recovery plan addresses the following federal ESA-listed and Washington state Species of Concern: bull trout, steelhead trout, Chinook (spring, summer and fall) salmon, and sockeye salmon.

By addressing these species, the plan meets the requirement for recovery plans under section 4(f) of the ESA. Meeting ESA section 4(f) requirements does not mean that the SRSRB, or its individual members and jurisdictions, will receive federal regulatory assurances that limit liability under the ESA upon adoption of this plan by the federal agencies. The draft recovery plan does, however, lay the foundation for development of these assurances over time.

The SRA also specifies a process for prioritizing habitat restoration projects in a "habitat projects list" for each region of the State. The SRA requires a "critical pathways methodology" for development of the habitat projects list. One component of this methodology is a "limiting factors analysis" addressing habitat conditions for salmon in each region. The Washington State Conservation Commission (WSCC) is responsible for developing the limiting factors analysis for

each WRIA. The SRA is directly linked with the WMA that requires "where habitat restoration activities are being developed under [the SRA], such activities shall be relied on as the primary non-regulatory habitat component for fish habitat." The WRIA 35 Limiting Factors Analysis was published by the WSCC in March 2002.

Salmon recovery planning is part of a larger array of planning taking place within the region. The recovery plan developed by the SRSRB is based primarily on the subbasin plans developed by local entities in partial response to the Northwest Power and Conservation Council's (NPPC) Fish and Wildlife Program. Plans which may affect or be affected by the recovery plan include Habitat Conservation Plans and other documents developed under the ESA, State of Washington habitat preservation programs, conservation reserve enhancement programs, watershed plans, and harvest management plans. In addition, master plans and comprehensive plans developed by communities, as well as land and water use plans for communities and counties.

Subbasin Planning

The WRIA 35 planning effort also integrates portions of the Bonneville Power Administration/Northwest Power Planning Council's (NPPC) Subbasin Plans developed for the Asotin, Middle Snake, Tucannon and Grande Ronde.

Under the Northwest Power Act, Congress charged the Council with developing and periodically amending a fish and wildlife program for the Columbia River Basin to protect, mitigate and enhance fish and wildlife affected by the development and operation of hydroelectric facilities while assuring the Pacific Northwest an adequate, efficient, economical and reliable power supply.

In 2000, the Council reorganized the fish and wildlife program around a comprehensive framework of scientific and policy principles. The fundamental elements of the revised program framework are desired accomplishments regarding fish and wildlife; basinwide biological objectives; implementation strategies; and a scientific foundation. Adoption in 2003 of a coordinated plan for the mainstem Columbia and Snake rivers was the second step in the comprehensive revision of the program. The third step in the reorganization was the development of subbasin plans.

The subbasin plans include specific actions and projects recommended by the Council for Bonneville funding and implementation, and provide the context for the review of proposals for funding by the Independent Scientific Review Panel and the Council.

Subbasin plans include three elements: a technical assessment, an inventory of past and current efforts, and a management plan of objectives and strategies. The objectives and strategies have been identified for specific priority geographic restoration areas to improve habitat conditions for salmonid lifestages. Management strategies address stream, riparian and upland practices in both urban and rural settings within the priority restoration areas.

Subbasin plans were completed in 2004 for each the geographic areas encompassing WRIA 35 (Asotin - May 2004; Grande Ronde - Dec 2004 with Supplement Jan 2005; Tucannon - May 2004; Lower Snake – May 2004). Development of the sub-basin plans have been supported by

the WRIA 35 Planning Unit and, as indicated in the discussion above, have also been used to develop the Draft Snake River Salmon Recovery Plan.

1.4 Conformance with SEPA

The State Environmental Policy Act (SEPA) was enacted to ensure that state and local agencies consider the likely environmental consequences of proposed actions during their decision-making processes. Under the SEPA Rules (Chapter 197-11 WAC), nonproject actions such as decisions on policies, plans, or programs, are included under SEPA authority. Therefore, a SEPA review is required for both the State's Watershed Planning Program and this WRIA 35 Watershed Management Plan.

On July 18, 2003, the Washington State Department of Ecology (Ecology) produced the Environmental Impact Statement for Watershed Planning (statewide EIS) under Chapter 90.82 RCW. The statewide EIS was produced by Ecology at the request of the 2001 State Legislature to serve as a "template" for environmental review under SEPA for local approval of watershed plans. The intent was for Ecology to develop a statewide EIS that could be adopted in whole or in part by SEPA lead agencies as part of local watershed plan approval processes. This statewide EIS is intended to assist local decision makers in meeting SEPA requirements, but does not eliminate the need for local decision makers to comply with SEPA.

In order to conform with SEPA, this WRIA 35 Watershed Management Plan must be evaluated under the SEPA rules established by the appropriate SEPA lead agency, prior to approval of the Plan. Based on the lead agency's determinations as to the environmental effects of the plan, the lead agency may adopt the statewide EIS in lieu of preparing a plan-specific EIS, adopt the statewide EIS and prepare a supplement or addendum that addresses plan-specific issues, or prepare a plan-specific EIS. Individual actions and projects recommended within the plan may require further review under SEPA and other federal, state, and local regulations prior to their actual implementation.

An addendum is being prepared in support of adoption of the statewide EIS as part of the SEPA review of the WRIA 35 Watershed Management Plan. The Addendum briefly describes the Proposed Action (e.g., the WRIA 35 Watershed Management Plan) and provides an assessment of the adequacy of the statewide EIS to address the environmental issues associated with implementing the actions in the WRIA 35 Watershed Management Plan. The Addendum, provided in Appendix A (*under development*), includes:

- A brief description of the Plan.
- A summary of the WRIA 35 affected environment.
- A brief description of the statewide EIS and a comparison of the WRIA 35 Plan's proposed actions to the actions evaluated in the statewide EIS.

1.5 Plan Limitations

It is recognized that the documents used in the formation of the watershed plan may not provide complete and detailed information for all water resource management strategies or water quality

actions. The collection of existing data has been subject to time and budget constraints. Despite the limitations, the Middle Snake Watershed Plan has been based upon the best information available in WRIA 35 and is consistent with the requirements of RCW 90.82.120. Nothing within this plan shall:

- Conflict with existing state statutes, federal laws, or tribal treaty rights;
- Impair or diminish in any manner any existing water rights;
- Modify or require the modification of any waste discharge permit issued under Chapter 90.48. RCW;
- Modify or require the modification of activities or actions taken or intended to be taken under a habitat restoration work schedule developed under Chapter 246, Laws of 1998; or
- Modify or require the modification of activities or actions taken to protect or enhance fish habitat if the activities or actions are consistent with the parameters and requirement of RCW Chapter 90.82.120(1)(g); and
- The identification and estimation of surface and groundwater rights for various entities and persons referenced within this watershed plan are for the singular purpose of estimating water availability and demand, as well as to provide a general understanding of water resource and management issues throughout WRIA 34. The estimations of water rights are neither an admission nor an opinion on the validity or extent of any respective water right by any participant in the planning process, or any other entity or person identified.

Section 2
Planning Process

This section presents the planning process followed by the local governments, tribal governments, agencies, and stakeholders in developing this watershed management plan.

2.1 Initiating Governments

The initiating governments are Asotin, Garfield, Columbia and Whitman Counties, the City of Clarkston, and the Asotin County Public Utilities District (PUD) as the major water purveyor. In accordance with the WMA, the initiating governments for the WRIA 35 basin designated Asotin County PUD as the lead agency for watershed planning. As lead agency, Asotin PUD received grant funding from the State of Washington and contracted with the Washington Department of Ecology (Ecology) to conduct this watershed planning effort.

2.2 Planning Unit Mission and Participants

The Asotin PUD convened organizational meetings and established a core Planning Unit and Steering Committee with representation from various agencies and stakeholders in WRIA 35. The mission of the Planning Unit is to treat water as a valuable resource through the development and implementation of a watershed plan consistent with RCW 90.82 for the beneficial management of water resources to balance the present and future needs of local rural and urban communities, agriculture and other industries, fish and wildlife, and tribal communities and treaty rights.

In addition to the initiating governments listed above, the following entities are also participating as voting members of the Planning Unit:

- City of Asotin
- City of Pomeroy
- City of Starbuck
- Columbia Conservation District
- Asotin Conservation District
- Pomeroy Conservation District
- Whitman Conservation District
- Washington Wheat Growers Assn.
- Washington State University Ag. Extension
- Tri-State Steelheaders
- Asotin County Sportsmen
- Blue Mountain Land Trust
- Washington State Caucus (represented by Washington Dept. of Ecology)
- Nez Perce Tribe
- Confederated Tribes of the Umatilla Indian Reservation
- Port of Clarkston
- Port of Whitman
- 12 Community Members

Stakeholders in the watershed, including local, state, and federal agencies, are represented on the Planning Unit in a voting capacity. Agency representatives also provide assistance and guidance. In addition to the voting members listed above, the following non-voting stakeholders involved in watershed planning for WRIA 35 include:

- Private landowners and land managers
- Asotin County Department of Emergency Management (DEM)
- Washington Department of Fish and Wildlife (WDFW)
- Snake River Salmon Recovery Board (SRSRB)
- U.S. Forest Service – Umatilla National Forest
- U.S. Fish and Wildlife Service (USFWS)
- National Oceanic and Atmospheric Agency (NOAA) Fisheries
- Natural Resource Conservation Service (NRCS)
- ECOS USA

The Asotin PUD hired Economic and Engineering Services, Inc. (now part of HDR Inc.) to provide technical support in preparation of the watershed management plan and supporting documentation. The forward of this document includes a list of planning participants.

2.3 Planning Process

Voluntary watershed planning under the WMA occurs in three primary phases:

1) Phase I: Organization
2) Phase II: Conducting Watershed Assessments
   a. Level 1: Summarize Existing Data and Identify Data Gaps
   b. Level 2: Gather Additional Information to Fill Data Gaps
   c. Level 3: Long-term Monitoring
3) Phase III: Developing a Watershed Plan

2.3.1 Planning Goals

Under Phase 1 of the Watershed Planning Process (RCW 90.82), the Planning Unit and Committee Organization for WRIA 35 – Middle Snake River Basin was formed in April 2003. During that process, the Planning Unit decided to address the required water quantity component of watershed planning along with the all three of the optional components including instream flow, water quality, and habitat. The habitat assessment component is being addressed under the concurrent Salmon Recovery and Sub-basin Planning efforts. Information from these planning efforts is accounted for in the Watershed Plan.

2.3.2 Planning Elements

The Watershed Management Act (WMA) identifies one required element (water quantity) and three optional elements (water quality, instream flows, and habitat) of watershed planning.

While developing its mission and planning goals in 2003, the Planning Unit determined that all four elements would be included in the Middle Snake Watershed Plan.

Water Quantity

This element involves assessing water supply and use in the management area, and developing strategies for future use. It involves items such as assessment of available water, inventory of water rights, projections for future water demand, and methods for increasing available water. The planning unit develops alternatives for meeting current and future needs for both in-stream and out-of-stream objectives.

Instream Flow

The planning unit may request that the Department of Ecology (Ecology) modify laws concerning existing minimum instream flows, or adopt new minimum instream flows for streams that do not have them. Chapter 90.82 RCW establishes a specific procedure for recommending instream flows that gives tribes and local government members of the planning unit the responsibility to make the planning unit's decisions on this topic.

In 2005, a series of technical memoranda (available at www.astoinpud.org/msww/ms_documents.htm) were developed to address the central aspects of managing instream flows within WRIA 35. These memoranda were intended to support an overall stream flow management strategy proposed in Technical Memorandum No. 1: Stream flow management framework (TM-1). This document laid out the Planning Unit's goals for instream flows, as well as discussed significant flow issues and other existing controls on instream flows in WRIA 35. The document presented recommendations for minimum instream flows that would protect significant aquatic species including steelhead, Chinook, and bull trout, while continuing to ensure water availability for human uses. Subsequent supporting documents to TM-1 include the following:

- Technical Memorandum No. 2a: Minimum Instream Flow Framework (TM-2a)
- Technical Memorandum No. 2b: Proposal for Administrative Closures (TM-2b)
- Technical Memorandum No. 3: Proposed Flow Enhancement Targets for WRIA 35 (TM-3)

Technical Memorandum No. 2a focuses on setting minimum instream flows (MIF) for two locations on the Tucannon River (MP1-Starbuck, and MP3-Marengo) based on habitat needs for steelhead, Chinook, and bull trout using Instream Flow Incremental Methodology (IFIM). Other minimum instream flows might also be set for some locations in the Asotin Creek drainage pending results of ongoing instream flow studies being conducted there.

- Technical Memorandum No. 2b addresses how Ecology's Surface Water Source Limitations (SWSL), affect stream flow management in WRIA 35. Surface Water Source Limitations are administrative low flow restrictions and withdrawal closures imposed on surface waters of the state for the purpose of protecting important aquatic species. The TM-2b also provides recommendations for future SWSLs and exceptions to existing SWSLs that might be integrated into the instream flow management strategy.

Technical Memorandum No. 3 proposes preliminary stream flow enhancement targets for the Tucannon River and Asotin Creek at specific management points. Choosing management points for enhancement targets on these two water courses was based on the following:

- Stream reaches where low flow is a limiting factor for fish and the reach has been identified as a priority for restoration
- Reaches downstream of existing diversions where there is a potential for changes in water use to provide additional instream flow.
- Management points should consolidated to account for all upstream flow enhancement activities

The document proposed preliminary flow enhancement targets for management points on the Tucannon River, Pataha Creek, North Fork Asotin Creek, and Charley Creek

Water Quality

The Water Quality element includes items such as the degree to which existing standards are being met, the causes of water quality violations, consideration of total maximum daily loads (TMDL), and recommendations for monitoring. The planning unit is not authorized to set water quality standards, but can provide input as Ecology establishes TMDLs. The planning unit may wish to develop its own set of goals for each water quality parameter, in addition to those contained in state water quality laws and regulations.

Habitat

The Habitat element involves "coordination and development of the watershed plan to protect or enhance fish habitat in the management area." The law emphasizes integration with other laws and programs that address habitat restoration and recovery, particularly, the Salmon Recovery Act. Setting and restoring instream flows and managing demand and hydraulic continuity effects are among the key elements of habitat protection and restoration.

These elements or issues are typically interconnected and some overlap should be expected during their discussion. The following sections address the four key planning issues as they relate to the five individual implementation areas. Varying levels of detail are available for each area; as a result, the descriptions of key planning issues also vary between implementation areas.

Key factors in addressing aquatic habitat needs in WRIA 35 are the identification of major and minor spawning areas (MSA and mSA respectively), imminent threats, and priority protection and restoration areas. Projects and programs benefiting habitat were prioritized, during the SRSR planning process, based on their intrinsic ecological improvement potential. This prioritization targeted projects and programs that would show a "likely value in …recovery" of the key species and have an "ability to protect, restore, or enhance treaty reserved resources of the affected Indian Tribes."

Major and Minor Spawning Areas (MSA/mSA)

Prioritization of streams was based on delineation between Major Spawning Areas (MSAs) and Minor Spawning Areas (mSAs). MSA's are the highest priority for protection and restoration actions to quickly (within 2 to10 years) achieve the highest potential fish production in the basin. Actions in mSA's will increase fish production and ensure spatial distribution but the potential is lower in these areas, therefore actions in these areas are a slightly lower priority than those in MSA's.

Imminent Threats

In addition, projects were prioritized based on imminent threat and designation as priority restoration and protection areas. Imminent threats are considered first priority projects, and include passage barriers that might delay migration, fish screens and unscreened diversions that might entrain migrating fish or prevent passage, and dry stream reaches that prevent passage or cause stranding.

Priority Protection and Restoration Areas

Priority protection areas are stream reaches that, if allowed to degrade, represent substantial decline in abundance, productivity and life history diversity. Priority restoration areas are those that, if restored show greater gains in abundance, productivity and life history diversity when compared to other areas. Some stream reaches are considered as a high priority for both preservation and restoration because they currently support high productivity but, with improvement, have the capacity to increase fish production. A complete explanation of priority protection and restoration is given in the SRSRP.

Basin-Wide Goals

The Planning Unit also developed the following basin-wide goals for WRIA 35 watershed planning:

- Protect existing water rights, private property rights and tribal treaty rights
- Emphasize voluntary and incentive-based management solutions
- Maintain and enhance the regional economy and provide future economic opportunities associated with the watershed hydrology, including but not limited to potable water, agriculture, industry, recreation and tourism
- Establish and maintain ongoing education and public involvement program
- Establish a detailed funding plan for implementation, including: projects, programs, long-term monitoring and evaluation of watershed plan implementation
- Ensure fairness in distributing costs and burdens of water resource management actions
- Obtain local, state and federal agencies (regulatory and management) and tribal buy-in and cooperation for recommended management strategies (Note: This section will be updated when instream flow recommendations are finalized by the Planning Unit)

- Provide long-term reliable and predictable water supplies for human uses
- Identify minimum and target stream flows, and manage stream flows to enhance habitat conditions for salmonids, with emphasis on steelhead and bull trout
- Protect surface and ground water quality needed for public drinking water supplies, agriculture, recreation , fish and other uses
- Improve certainty, timeliness and efficiency in water right decisions
- Improve scientific basis for understanding baseline conditions
- Identify and implement water conservation and efficiency strategies
- Maintain productive riparian habitat and enhance degraded habitat for salmonids in all life stages

The Planning Unit started the Phase II assessment work in October 2003 and has since completed significant portions of the water quantity, instream flow, and water quality assessments. The Phase II – Level 1 Assessment was completed in January 2005.

Target Assessments

The following Level 2 target assessments are scheduled to be completed in conjunction with the publication of this planning document and are discussed in more detail in Section 2.3.4 (supporting documents are listed after the description of each project):

- Tucannon Temperature Model – development of a temperature model for the Tucannon River, including an evaluation of natural riparian conditions.
  - *March 10, 2005* – Tucannon Temperature Conditions
  - *May 18, 2005* – Tucannon River – Comparison of Water Temperature and Elevation
- Multi-Purpose Storage Assessment – evaluation of the feasibility of using water storage to improve low flow conditions.
  - *March 17, 2005* – Water Storage Availability and Needs Assessment
  - *May 16, 2005* – Wetland Water Storage Sites and Screening Criteria
  - *May 18, 2005* – Hydrogeologic Assessment of the Tucannon River, Pataha Creek and Asotin Creek Drainages, WRIA 35, Columbia, Asotin and Garfield Counties, Washington
  - *June 3, 2005* – WRIA 35 Wetland Project, Preliminary Storage Sites
  - *March 6, 2006* – Conceptual Design Report, WRIA 35 Wetland-Water Storage Project
- Storage Pre-Construction Grant – collect baseline information and develop conceptual design for one or more storage opportunities.

Information from both the Level 1 and Level 2 assessments has been used to support the Phase III – Planning. For purposes of the planning process, the basin has been divided into five "implementation areas" comprised of: Asotin Creek, Middle Snake, Pataha Creek, Grande Ronde and the Tucannon River implementation areas. These areas, as discussed in Section 1, were delineated based on land use, fish habitat and hydrologic characteristics of the different areas in the Basin.

This document represents the culmination of the Phase III planning process, the WRIA 35 Watershed Plan.

2.3.3 Review of Existing Data

A Level 1 assessment of water quantity/instream flow and water quality in WRIA 35 was completed in January 2005. The assessment reviewed existing data and made a determination as to the adequacy of the information in quantifying the resources in the WRIA, both in terms of water quantity/instream flow, water quality, and habitat. Habitat assessment was completed primarily with information from Snake River Recovery and Subbasin Planning. The Level 1 assessment concluded:

- Agricultural (irrigation) use is the most prominent in the basin[1] but there is no readily available metered data for this type of use. Most of the agricultural use is derived from surface water sources. The largest single use is associated with urban irrigation and industrial/municipal use by areas served by the Asotin County Public Utility District (PUD), which utilizes ground water sources to meet these demands. Based on the water projection estimates through the planning period (2025), total demand in the basin is expected to be ~18,300 acre-feet per year, which includes both surface and ground water use. This is based on limited population growth and the assumption that irrigation use will not change significantly from current usage.
- There is a need to further examine the stream flow data in assessing the baseflow component from ground water returns, as well as to potentially identify gaining and losing reaches within the major basins in the WRIA.
- No formal minimum instream flows have been set in WRIA 35 by State rule. However, surface water source limitations closing or defining low flow limits have been established in several streams.
- Ground water discharge to streams is significant in the basin, ranging from approximately 30 percent in the winter months to over 90 percent of stream flow in the summer.
- Based on a rough estimate of the watershed-wide water balance, the net demands are less than 1 percent of the net precipitation in the basin.

2.3.4 New Studies Performed for Watershed Plan

Supplemental studies and assessments were conducted to develop necessary data, and where applicable, define projects for regarding instream flow, water quality, and multi-purpose storage in WRIA 35. This section briefly describes these studies. This section will be updated with study summaries as they are completed.

Tucannon River Temperature Assessment

Several reaches of the Tucannon River have been found to exceed the state water quality standards for temperature and have been included on Ecology's 303(d) list of impaired waters. In an effort to better understand the causes and extent of high instream temperatures, HDR staff

[1] There are also large commercial/industrial and municipal uses in the Clarkston area based on water rights.

compiled an extensive review of existing data, as well as conducted supplemental field studies within the Tucannon River Basin. The three major elements of this study included:

- Obtaining recent stream flow data from long-term flow monitors and augmenting available data with other short-term flow monitoring devices.
- Performing seepage studies (water inputs and outputs) throughout the Tucannon River basin and collecting other background data (i.e., WDFW stream temperature data, water rights data, irrigation withdrawal data, etc.)
- Conducting a riparian survey to calculate total potential for stream shading by measuring riparian canopy cover and riparian density.

These efforts were designed to provide enough information so that a comprehensive temperature model might be developed and the causes for high instream temperatures might be identified. As of November 2005, the data collection and field studies have been completed. The completed report of findings and recommendations are expected by summer 2006.

Multipurpose Storage Assessment (this section will be updated per Planning Unit direction)

A multipurpose water storage project was conducted to identify a method that would provide additional water storage capacity for the WRIA 35 watershed. The project is funded through a Level 2 assessment and pre-construction grant from Ecology. The project was expected to increase stream flows during the summer months and help to reduce high instream temperatures for fish. The general scope of the project included:

- Initial project consultation with Planning Unit, land owners, and agencies
- Preliminary site review
- Agency consultation
- Site investigations
- Site design
- Scoping of permitting and construction specifications

Early phases of project involved a water storage assessment that evaluated water availability, water storage needs, and feasible alternatives. The Planning Unit concluded that the two water storage measures that would best suit their needs would be wetland storage and aquifer storage. Two aquifer storage sites were evaluated in the Asotin Creek drainage on North Fork Asotin Creek. A third wetland storage site, located in the Tucannon River Basin, was considered as a potential water storage site. A conceptual site design was developed upon completion of the data collection associated with the site investigations (final design will be available at www.astoinpud.org/msww/ms_documents.htm).

Minimum Instream Flow Management Strategy

The Planning Unit for WRIA 35 has developed a comprehensive flow management strategy as part of the watershed management plan that is intended to protect flows for instream uses (primarily fish needs) and provide water for future out-of-stream needs. The stream flow management framework is comprised of four primary components:

- Regulatory flows (*protection)*
- Non-regulatory flows (*enhancement)*
- Flow Monitoring
- Water supply-related recommendations

Seventeen management points have been identified as control points for upstream activities so that downstream watershed objectives are met. To date, preliminary minimum instream flows have been recommended for the Tucannon River and are pending for Asotin Creek. Preliminary recommendations for either removing or maintaining existing administrative stream closure have been made for each of the management points, and enhancement targets have been developed for these two streams. The recommendations are currently under review by the Planning Unit.

2.4 Public Involvement Process

The WRIA 35 Planning Unit directed the public involvement process. The purpose of this work is to help the WRIA 35 Planning Unit identify issues of concern in each sub-basin of the Middle Snake Watershed and to integrate public perception of watershed issues into the early stages of watershed assessment and plan development. Public involvement was sought through direct participation in the Planning Unit and through participation in one or more of a series of outreach workshops. Information on ongoing assessments and plan development was made available to the public through a web site and notices in local newspapers.

From May 21 – 28th, 2004, individuals interested in the health of the Middle Snake Watershed (WRIA 35) gathered in public workshops to discuss issues that impact the health of the watershed. Workshops were held in the Tucannon Subbasin (May 21), Pataha & Lower Snake Subbasins (May 22), Asotin Subbasin (May 27), the Lower Snake (Whitman County) Subbasin (May 28), and with the Nez Perce Tribe (May 28). Although sponsored under WRIA 35 watershed planning (2514), the workshops addressed relevant issues for the three primary planning processes in the basin: watershed planning, subbasin planning, and salmon recovery planning. Coordination between these three planning processes is vital for efficiency and to ensure consistency among the plans and their objectives.

The purpose of these workshops was three-fold: 1) to introduce watershed planning, salmon recovery planning, and subbasin planning efforts and report on their current status; 2) to develop a list of specific concerns in the watershed related to low flows, instream habitat, riparian vegetation, upland management, water supply, water quality, and other issues and identify where those issues are of primary concern; and 3) to initiate a continuing dialogue between the various stakeholders in the watershed. Benefits that were realized across all sub-basins included enhanced education and involvement of local stakeholders, development of an information foundation for Phase 2 watershed planning, improved communication/understanding between Nez Perce staff and local resource managers, and input for subbasin planning and salmon recovery planning goals, objectives and potential strategies.

A second series of workshops was held in September of 2005. They were focused on seeking additional public input on objectives and recommended basin-wide and management area-

specific action plans. This was accomplished by conducting workshops in each management area. Breaking up WRIA 35 into smaller areas gave the opportunity for focused outreach efforts with local stakeholders in each management area.

Section 3
Key Planning Elements by Implementation Area

3.1 Introduction

This plan addresses water quantity, water quality, instream flow and habitat elements. The following sections are designed to generally describe the existing conditions within each implementation area, and then specifically address how those conditions currently affect the four key planning elements.

3.1.1 Recent Events

In 2005, a wildland fire spread over three Implementation Areas (IA) within the WRIA 35 watershed planning area: Middle Snake IA, Pataha Creek IA and Tucannon River IA. The boundaries of the fire, as it relates to the planning area, are presented in Exhibit 3-1. Restoration activities related to the fire are discussed in Section 6 of the plan.

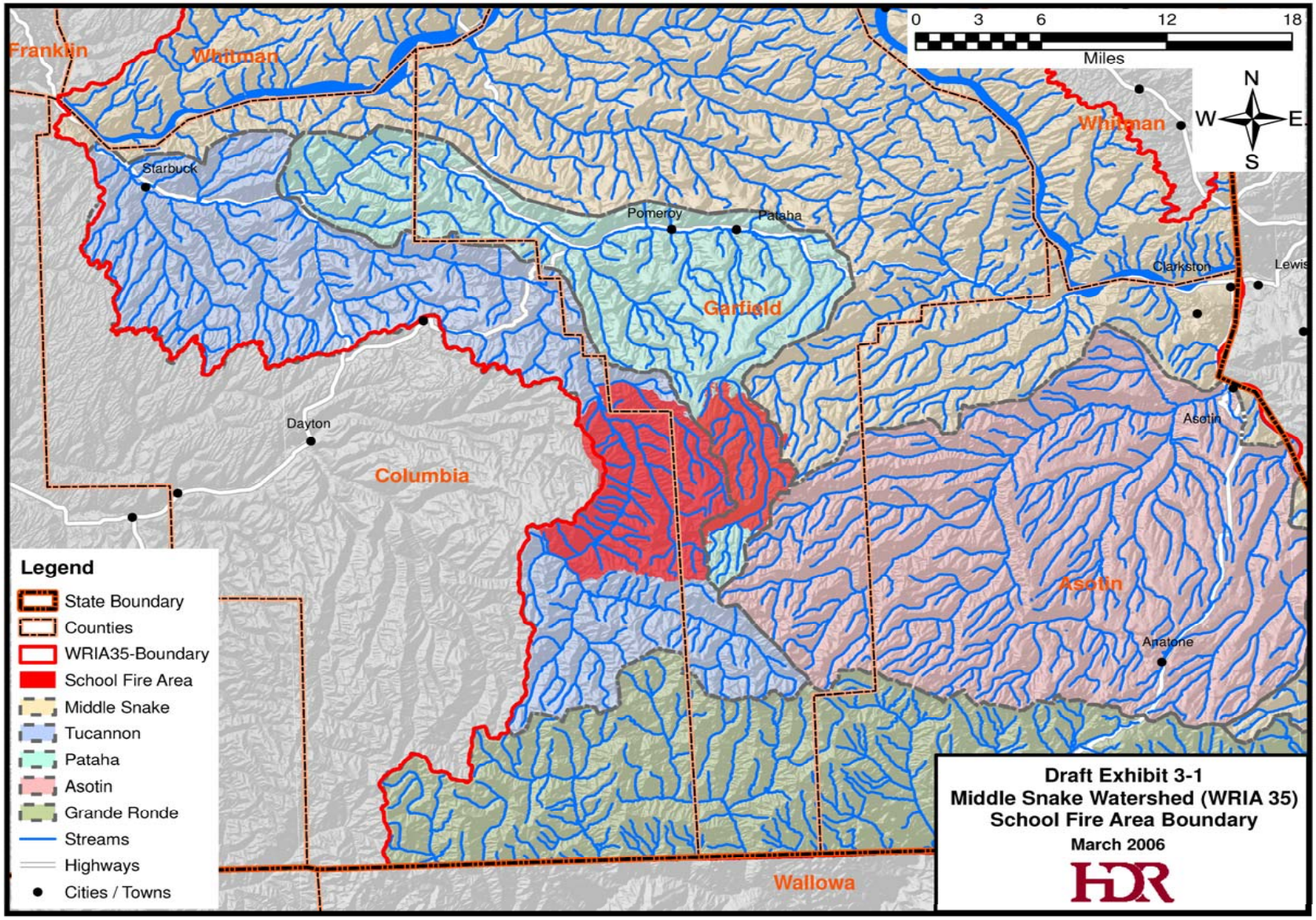
3.2 Asotin Creek Implementation Area

Asotin Creek Implementation Area (IA) is located west of the City of Asotin and includes the Asotin Creek drainage, its tributaries and George Creek. The Asotin Creek IA is approximately 325 square miles and land uses are a mixture of pasture and rangeland, forest, and cropland; however, the predominant land use is pasture and rangeland. Asotin Creek drains 119,000 acres and flows into the Snake River at the City of Asotin. George Creek drains 89,000 acres and enters Asotin Creek at RM 3.1. The population in the Asotin Creek IA is predicted to increase to 2,560 by the year 2025 from 2,463 people in the year 2005. A slight majority of the population (54 percent) currently resides in the City of Asotin; this trend is expected to continue through 2025.

According to the Draft Asotin Creek Subbasin Summary (NPPC 2001), historic and current land use practices have altered the hydrologic cycle of Asotin Creek. Farming, timber harvesting, and urbanization have changed the water cycle, reducing water infiltration and accelerating runoff.

3.2.1 Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in improved watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Asotin County Conservation District through funding reports to the Bonneville Power Administration (BPA) Columbia Basin Fish and Wildlife Authority. While not exhaustive, Table 3-1 demonstrates the extensive level of watershed activity in the IA. Exhibit 3-2 illustrates the approximate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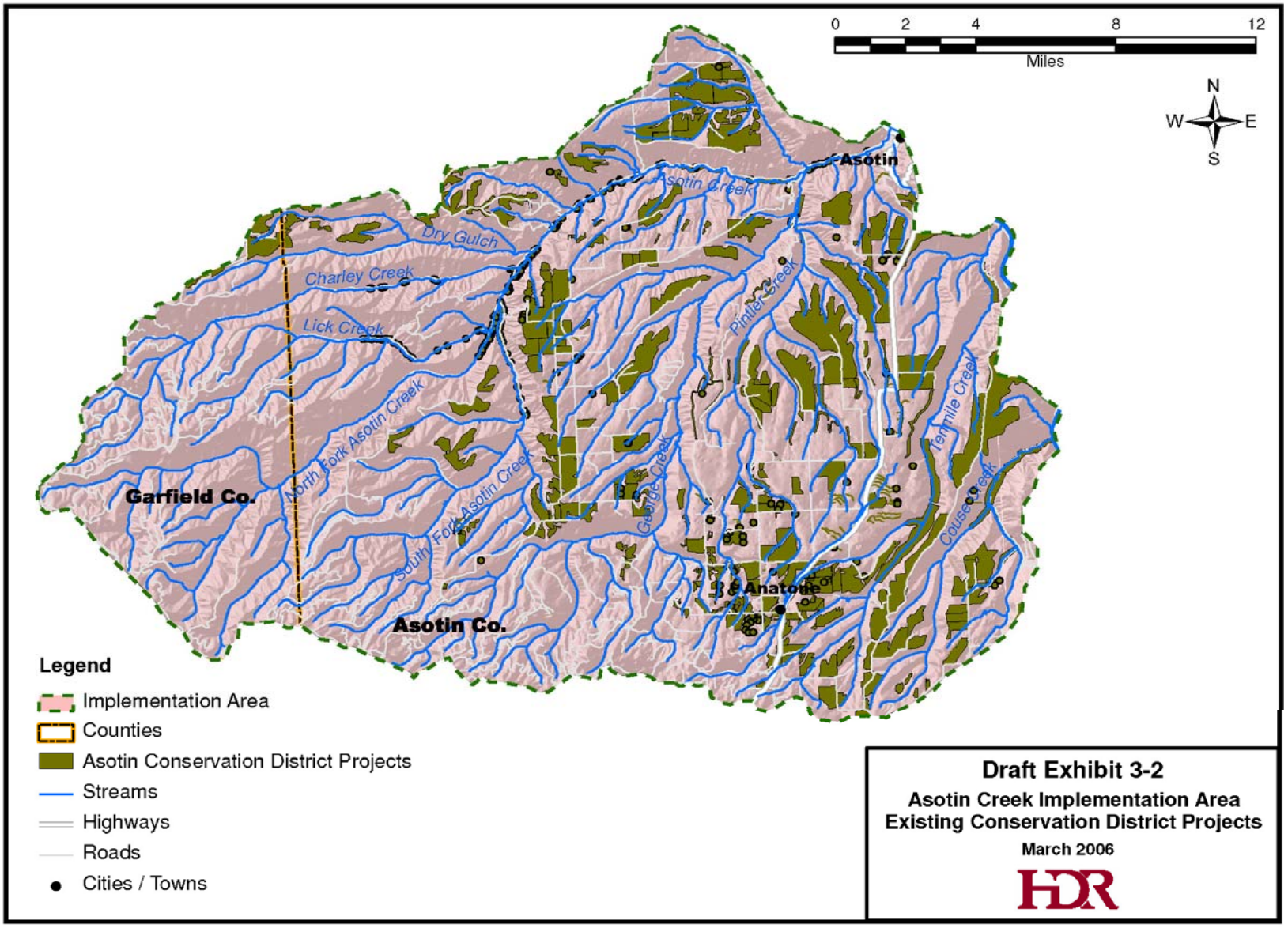
Draft Exhibit 3-1
Middle Snake Watershed (WRIA 35)
School Fire Area Boundary
March 2006
HDR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Tenmile Creek
Cousse Creek
Garfield Co.
Asotin Co.
Anatone
Legend
Implementation Area
Counties
Asotin Conservation District Projects
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 3-2
Asotin Creek Implementation Area
Existing Conservation District Projects
March 2006
HDR

geographic distribution of existing Asotin County Conservation District projects, as well as depicting the general types of projects completed.

In 1993, the Asotin Creek watershed was selected by the Washington State Conservation Commission (WSCC), through a joint contract with the BPA, and with assistance from the Natural Resource Conservation Service (NRCS), to prepare and implement the Asotin Model Watershed Plan. The purpose of the project was to help impact water quality and fisheries habitat concerns within the Asotin Creek Watershed by developing relationships between local landowners and resource agencies in the area. Specifically, the plan focused on enhancing and restoring habitat for Snake River spring/fall Chinook, summer steelhead, and bull trout[1]

Table 3-1
Asotin Creek Watershed Planning and Implementation Activities, 1980s-Present

Date	Activity and/or Accomplishment
mid-1980s	Past efforts include a WDG Instream Habitat Improvement Project in the early to mid-1980s. This project was funded by the ACOE through the LSRCP and included researching current knowledge of instream habitat improvement methods and implementing instream improvements on publicly owned portions of Asotin Creek. A monitoring and evaluation study was included in this project.
1991	Asotin Creek Water Quality Monitoring Project implemented
1994	Asotin Creek watershed analysis completed
1995	Asotin Creek Model Watershed Plan completed
	BPA early action projects completed on Asotin Creek.
	Frost-free watering troughs installed at three locations in watershed.
1996	Implemented Headgate Park pre- and post- monitoring of habitat restoration projects
1997	The installation and completion of fish and wildlife restoration projects on Asotin Creek include: 11 in-stream habitat restoration projects; 3 riparian exclusion fences; 6 riparian fences; 14 sediment basins; 54 sediment basin cleanouts; 1 multi-purpose pond construction; 1,800 ft. of terraces; and 1 three-month water quality study
1998	246 projects completed through Asotin Creek Model Watershed Plan from 1995-1998, including construction of hard structures (e.g. vortex rock weirs), meander reconstruction, placement of large woody debris and whole trees to create off-channel rearing habitat. A total of 139 pools were created with these structures. Three miles of stream benefited from riparian improvements such as fencing, vegetative plantings, and noxious weed control. Two alternative water developments were completed, providing off-stream watering sources for livestock. A total of 20,500 ft. of upland terraces, 7 sediment basins, 187 acres of grass seeding, 850 acres of direct seeding and 18 sediment basin cleanouts were implemented to reduce sediment production and delivery to streams in the watershed.
1999	A total of 38 pools were created using habitat structures. Three miles of stream benefited from riparian improvements such as vegetative plantings (17,000 trees and shrubs) and noxious weed control. Two sediment basins, 67 acres of grass seeding, and 745 acres of minimum till were implemented to reduce sediment production and delivery to streams in the watershed.
2000	The Asotin Creek Riparian Tree Planting Project planted approximately 53,100 trees and shrubs in the Asotin Creek watershed
	The ACCD partnered with the USFS to monitor sediment, cobble embeddedness, and macro-invertebrates
2001-2003	141,923 feet of fencing constructed; 186,300 trees planted; 13,045 acres of direct seed planted; 996 acres of pasture/hayland planted; 30 sediment basins constructed; 31,985 feet of terrace completed; 5 feedlot improvements; 31 water developments constructed; 7 sediment basins cleaned/repaired; 8 ponds constructed; 1 windbreak completed; 27 CREP contracts signed; 60.15 miles of CREP stream fenced;

[1] (Model Watershed Development in Eastern Washington, Annual Progress Report, Project Period: October 1, 1996 to December 31, 1997)

Table 3-1 Asotin Creek Watershed Planning and Implementation Activities, 1980s-Present	
Date	**Activity and/or Accomplishment**
	1152.4 acres of CREP acres protected
2002-2003	Lick Creek: 28.5 miles of road surveyed, 21.3 miles of road decommissioned, 7.2 miles of road abandoned; Charley Creek: 19 miles of road surveyed, 5 streambanks repaired and stabilized
Source:	
Asotin Creek Subbasin Summary DRAFT November 30, 2001	

3.2.2 Water Quantity

There are four major categories of water users identified in the Asotin Creek IA including major public water systems (City of Asotin), small public water systems (Anatone), individual household wells, and agricultural water users. Because the communities in this area are relatively small and pasture, rangeland, and cropland are the predominate landuses, the most significant water use is associated with agriculture, including stock watering and pastures.

Surface and Groundwater Rights

Tables 3-2 and 3-3 provide summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights, respectively (HDR-EES, 2005). Water rights with irrigation being one of the purposes of use accounts for over 60 percent of the total annual water rights allocated. Almost 60 percent of the water rights in terms of annual volume limits are associated with surface water sources.

Table 3-2 Summary Surface Water Rights for The Asotin Creek IAIA[1]			
Purpose of Use[2]	**Number of Records**	**Annual Quantity (afy)**	**Instantaneous Quantity (cfs)**
Consumptive Uses[3]			
Irrigation	24	754.2	32.16
Stock Watering	11	35.8	0.83
Municipal	-	-	-
Domestic	3	7.5	0.11
Commercial	-	-	-
Sub-Total Consumptive	**38**	**797.5**	**33.10**
Non-Consumptive Uses[4]			
Power Generation	-	-	-
Fish and Wildlife Propagation	1	10.0	0.10
Recreation	-	-	-
Sub-Total Non-Consumptive	**1**	**10.0**	**0.10**
Total (primary only)	**39**	**807.5**	**33.20**
Notes:			
1) Table includes data pertaining only to primary water rights as listed in Ecology Water Rights Application Tracking System (WRATS) database. Water rights claims and applications are not included in this table because they are not appropriated rights.			

2) Water rights that have multiple purposes of use are considered only once in this summary.
- Any water right that includes irrigation as a purpose of use in included with the irrigation use category. These water rights are not summed with the other purpose of use totals.
- Any water right that has both domestic and stock water purposes of use are include in the Domestic use category. Most Domestic Single water rights also have Stock Watering right associated with them.

3) Consumptive sub-total includes rights associated with permits and certificates for out-of-stream consumptive uses (i.e., irrigation, stock watering, municipal, domestic, and commercial uses).

4) Non-Consumptive sub-total includes rights associated with permits and certificates for instream non-consumptive uses (i.e., power generation, fish and wildlife propagation, recreation).

Table 3-3
Summary Ground Water Rights for the Asotin Creek IA[1]

Purpose of Use[2]	Number of Records	Annual Quantity (afy)	Instantaneous Quantity (gpm)
Consumptive Uses[3]			
Irrigation	6	314.9	335
Stock Watering	-	-	-
Municipal	3	156.2	308
Domestic	5	9.3	43
Highway Maintenance	1	120.0	75
Commercial			
Sub-Total Consumptive	**15**	**600.4**	**761**
Non-Consumptive Uses[4]			
Power Generation	-	-	-
Fish and Wildlife Propagation	-	-	-
Recreation	-	-	-
Sub-Total Non-Consumptive	**0**	**0**	**0**
Total (primary only)	**15**	**600.4**	**761**

Notes:

1) Table includes data pertaining only to primary water rights as listed in Ecology Water Rights Application Tracking System (WRATS) database. Water rights claims and applications are not included in this table because they are not appropriated rights.

2) Water rights that have multiple purposes of use are considered only once in this summary as per the following:
- Any multipurpose water right that has both municipal and commercial/industrial purposes of use is included in the municipal use category.
- Any multipurpose water right that has a commercial/industrial purpose of use is listed as commercial unless it also has a municipal purpose.
- Any water right that includes irrigation as a purpose of use is included with the irrigation use category if the right is not used for municipal or commercial purposes. Many irrigation water rights also have stock watering rights. Many irrigation rights also have domestic rights associated with them.
- Any water right that has both domestic and stock watering purposes of use is included in the domestic use category if the right is not used for municipal, commercial, or irrigation purposes.
- Heat exchange water rights are listed as municipal.

3) Consumptive sub-total includes rights associated with permits and certificates for out-of-stream consumptive uses (i.e., irrigation, stock watering, municipal, domestic, and commercial uses).

Future Water Demand

Future demand for municipal and residential use was calculated using population forecasts, land use, and per capita demand and is presented in Table 3-4.

Table 3-4
Average Annual Volume Projection for Asotin Creek Implementation Area
(acre feet per year)

Year	City of Asotin	Rural Asotin Co.	Rural Garfield Co.
1990	353	-	-
1995	385	-	-
2000	394	141	22
2005	409	124	23
2010	430	140	23
2015	452	132	23
2020	475	121	23
2025	499	86	23

Agricultural water use is limited in the Asotin IA. The 1997 Census of Agriculture documented only 329 acres of irrigated land. The majority of this land (289 acres) is pasture used for livestock grazing. Future development of vineyards in the area would likely increase the extent of irrigated agriculture in the IA. Barring the development of vineyards, agricultural activity and associated water use is anticipated to remain relatively constant over time.

3.2.3 Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

The Level 1 WRIA 35 Assessment included information regarding instream flow gauges. Table 3-5 includes an updated list of gauge locations that have produced data that was used in development of minimum instream flow recommendations.

Proposed SWSLs for the IA include closures and restrictions at the management points, as well as minimum instream flows and flow enhancement targets will be included in Exhibit 3-3 of the final watershed plan.

Table 3-5

WRIA 35 Gauge ID Matrix for Asotin Creek Implementation Area

Gauge No.	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
1	Asotin	USGS	13334700	Asotin Creek below Kearney Grade	Daily Streamflow	1959-1982; 1989-1996
2	Asotin	USGS	13334450	Asotin Creek at NF/SF Confluence	Daily Streamflow	2001-Present
3	Asotin	USGS	13334500	Asotin Creek near Asotin	Daily Streamflow	1928-1959
4	Asotin	USGS	13335050	Asotin Creek at Asotin	Daily Streamflow	1988-1989; 1991-2002
5	Asotin	USGS	13334400	Mill Creek at Anatone	Peakflow	1971-1977
6	Asotin	USGS	13334900	Pintler Creek near Anatone	Peakflow	1971-1977
7	Asotin	Ecology	35H050	Couse Creek at Mouth	Manual Stage Height	June 2003-Present
8	Asotin	Ecology	35J050	Tenmile Creek at Mouth	Manual Stage Height	June 2003-Present

Exhibit 3-3 Asotin Creek Proposed Water Use Restrictions

THIS EXHIBIT UNDER DEVELOPMENT

3.2.4 Water Quality

Major water pollutants within the IA are temperature and fecal coliform, with temperature the most significant water quality impairment. Most high stream temperatures in the Asotin Creek drainage have been attributed to an overall reduction of riparian vegetation.

Table 3-6 shows the most recent 303(d) list of impaired water bodies released by Ecology. All waterbodies on the 303(d) list are classified as Category 5, meaning that Washington's state water quality standards have been exceeded, and there is no existing TMDL or pollution control plan. TMDLs are required for the water bodies in this category, but TMDLs are not yet underway for this IA .

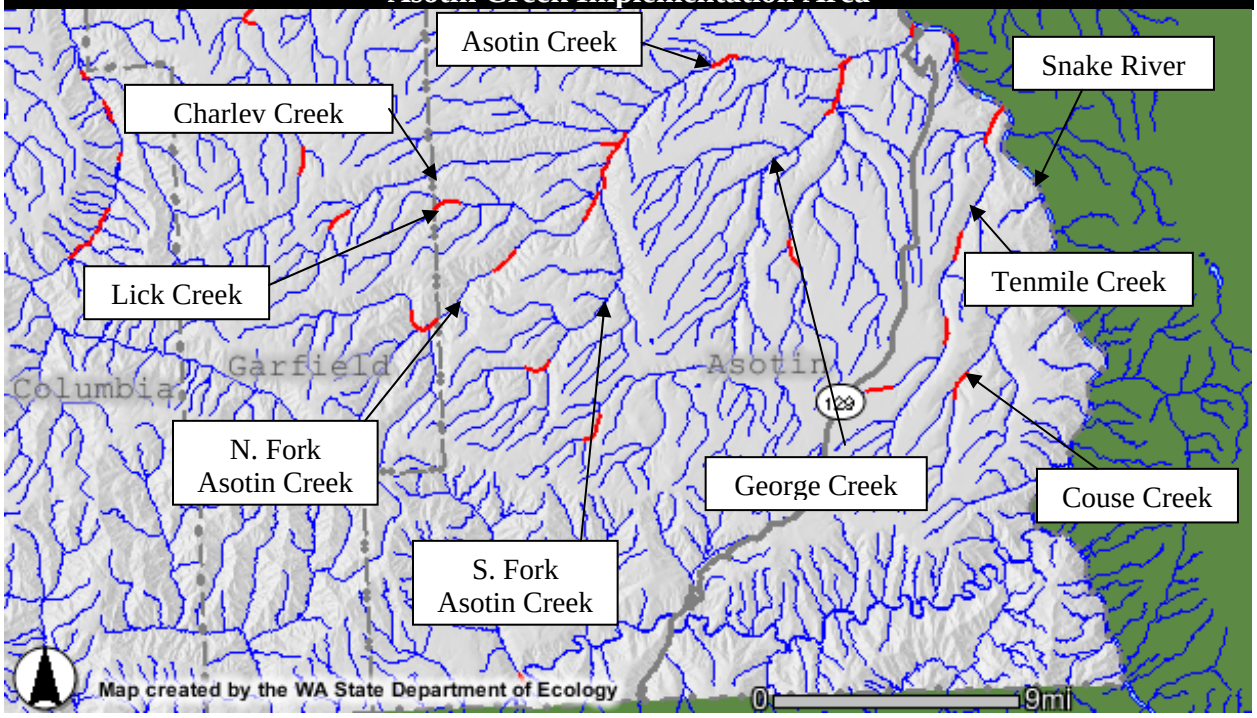
Table 3-6
2004 TMDL and 303(d) Listing Status in the Asotin Creek Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
16795	35	Asotin Creek	Fecal Coliform	5	None
13863	35	Asotin Creek	Temperature	5	None
13852	35	Asotin Creek	Temperature	5	None
13854	35	Asotin Creek	Temperature	5	None
13851	35	Asotin Creek	Temperature	5	None
13860	35	Asotin Creek	Temperature	5	None
22425	35	North Fork Asotin Creek	Temperature	5	None
13985	35	North Fork Asotin Creek	Temperature	5	None
13986	35	North Fork Asotin Creek	Temperature	5	None
22426	35	South Fork Asotin Creek	Temperature	5	None
13858	35	South Fork Asotin Creek	Temperature	5	None
22427	35	Charley Creek	Temperature	5	None
13862	35	Charley Creek	Temperature	5	None
29320	35	Couse Creek	Temperature	5	None
29318	35	Couse Creek	Temperature	5	None
29321	35	George Creek	Temperature	5	None
22429	35	George Creek	Temperature	5	None
20352	35	George Creek	Temperature	5	None
22430	35	Lick Creek	Temperature	5	None
29317	35	Mill Creek	Temperature	5	None
20354	35	Pintler	Temperature	5	None
20356	35	Tenmile Creek	Temperature	5	None
18835	35	Tenmile Creek	Temperature	5	None
18836	35	Tenmile Creek	Temperature	5	None
20355	35	Tenmile Creek	Temperature	5	None

The polluted waterbodies in this area include the following and are illustrated in Exhibit 3-4:

- Asotin Creek mainstem
- North Fork Asotin Creek
- South Fork Asotin Creek
- Charley Creek
- Couse Creek
- George Creek
- Lick Creek
- Mill Creek
- Pintler Creek
- Tenmile Creek

Exhibit 3-4
2004 303(d) Listed Waterbodies in the Asotin Creek Implementation Area



3.2.5 Aquatic Habitat

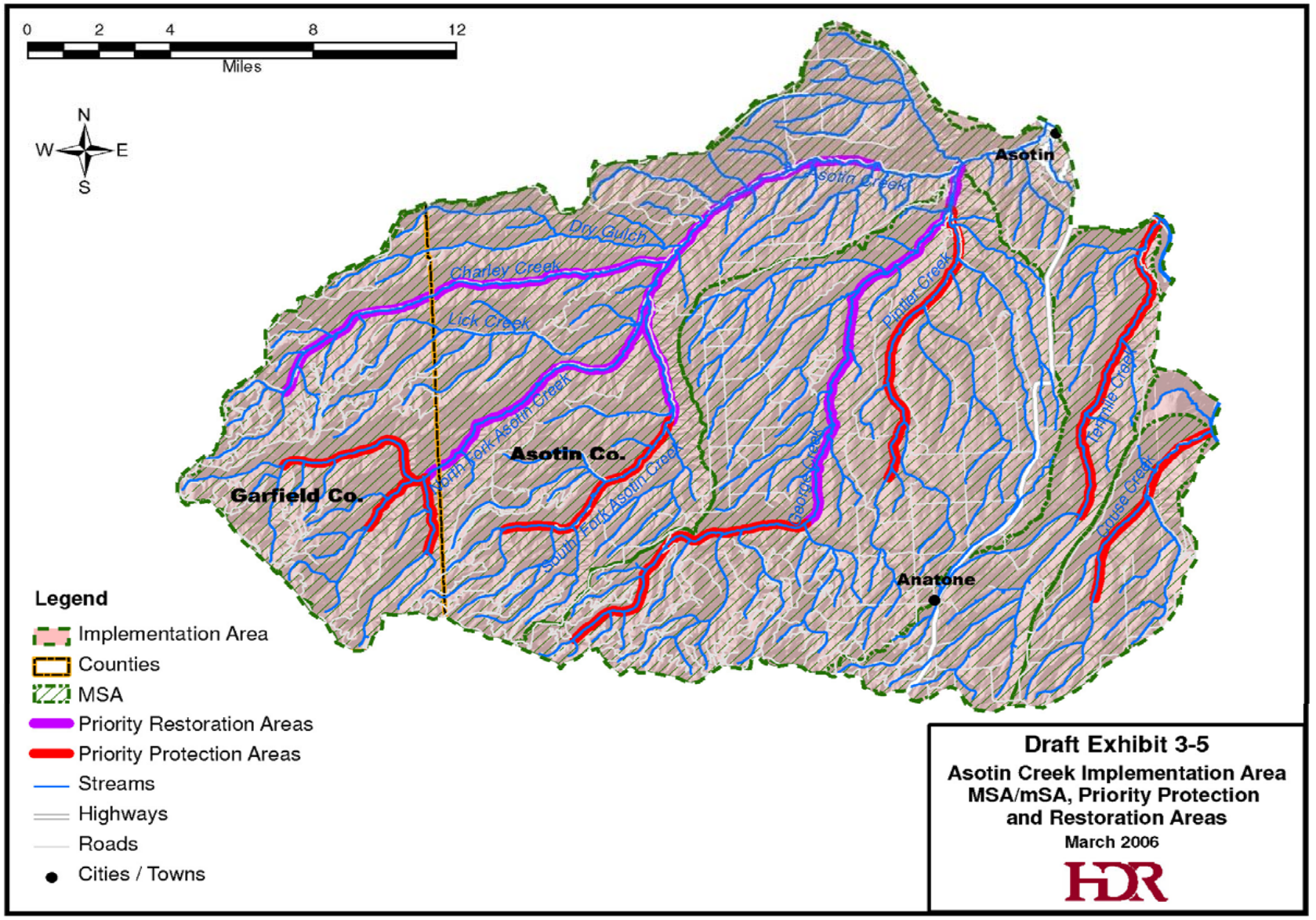
The Draft Snake River Salmon Recovery Plan (SRSRP) (Parametrix 2005) and Limiting Factors Analysis (LFA) (Kuttel 2002) have identified the following fish species as focal species within the Asotin Creek Implementation Area.

Snake River steelhead	*Oncorhynchus mykiss*
Spring and Summer Chinook	*Oncorhynchus tshawytcha*
Bull trout	*Salvelinus confluentus*

The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area below. Limiting factors for fish were determined using

Ecosystem Diagnosis and Treatment (EDT). The EDT process and specific details regarding the analysis may be found in the SRSRP. More information is also available in the LFA.

Exhibit 3-5 shows MSA/mSA's, imminent threats, and priority protection/restoration areas as described in the SRSRP (2006).


0 2 4 8 12
Miles
N
W E
S
Asotin
Asotin Creek
Dry Gulch
Charley Creek
Lick Creek
North Fork Asotin Creek
Asotin Co.
Garfield Co.
South Fork Asotin Creek
George Creek
Pintler Creek
Tenmile Creek
Couse Creek
Anatone
Legend
Implementation Area
Counties
MSA
Priority Restoration Areas
Priority Protection Areas
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 3-5
Asotin Creek Implementation Area
MSA/mSA, Priority Protection
and Restoration Areas
March 2006
HDR

Asotin Creek Mainstem and George Creek

Sediment load, channel stability, key habitat quantity, and habitat diversity are the primary factors limiting the abundance and productivity of steelhead and spring/summer Chinook in the Asotin Creek mainstem and the George Creek watershed. Flow and temperature were identified as secondary factors, although temperature is significant only in the upper reaches of the Asotin mainstem and in the George Creek mainstem.

Causes of Impacts to Asotin Creek and George Creek: From the late 19th century to about the middle of the 1960s, Headgate Dam had severe impacts on adult access and juvenile emigration. However, it and a handful of other potential physical obstructions are no longer considered significant problems. Natural conditions, along with grazing, crop production, and residential development are believed to be primarily responsible for the current suite of limiting factors in this portion of the IA.

Charley Creek

In the Charley Creek drainage, the aquatic assessment identified habitat diversity, key habitat quantity, channel stability, flow and temperature as the major limiting factors for both steelhead and spring/summer Chinook. A lack of key habitat for adult migrants and adults in the holding life stage depresses production in the lower two reaches. Sediment and low flow limits production and juvenile life stages in the uppermost reach. Temperature had high impacts on spring/summer Chinook spawners and steelhead incubation in the lower reaches of Charley Creek, but minimal effects in the upper watershed.

Causes of Impacts to Charley Creek: Factors limiting viability of salmonids in Charley Creek are somewhat different from those affecting the Asotin mainstem and George Creek because of a relatively greater impact associated with logging in the Charley Creek watershed. As with most watersheds in the West, historical logging operations have removed much of the old growth forest. By 1995, only about 400 acres of old-growth timber remained in the Asotin Creek IA, mostly along the North Fork Asotin and Charley Creek.

North Fork and South Fork Asotin Creek

The lower portion of South Fork Asotin Creek is primarily impacted by sediment load and key habitat quantity, and secondarily by habitat diversity, channel stability, low flow, and excessive temperature. The upper South Fork and North Fork have experienced similar impacts, except that temperature and sedimentation are no longer limiting. It should be noted, however, that sedimentation problems in the lower South Fork are thought to originate in the upper South Fork.

Causes of Impacts to North and South Forks of Asotin Creek: The human actions that are most responsible for habitat degradation in the North and South Fork of Asotin Creek watersheds are recent and historical logging operations, roads, and farming on the tops of ridges in the South Fork drainage. Road construction has produced negative impacts to riparian zones including increases in sedimentation. A natural factor that significantly impacts fish production potential, especially in the headwaters area of the forks, is the very high gradient of many reaches (4

percent or greater). With the elimination of large woody debris from logging, channel stability, and habitat diversity become significant limiting factors in very steep streams.

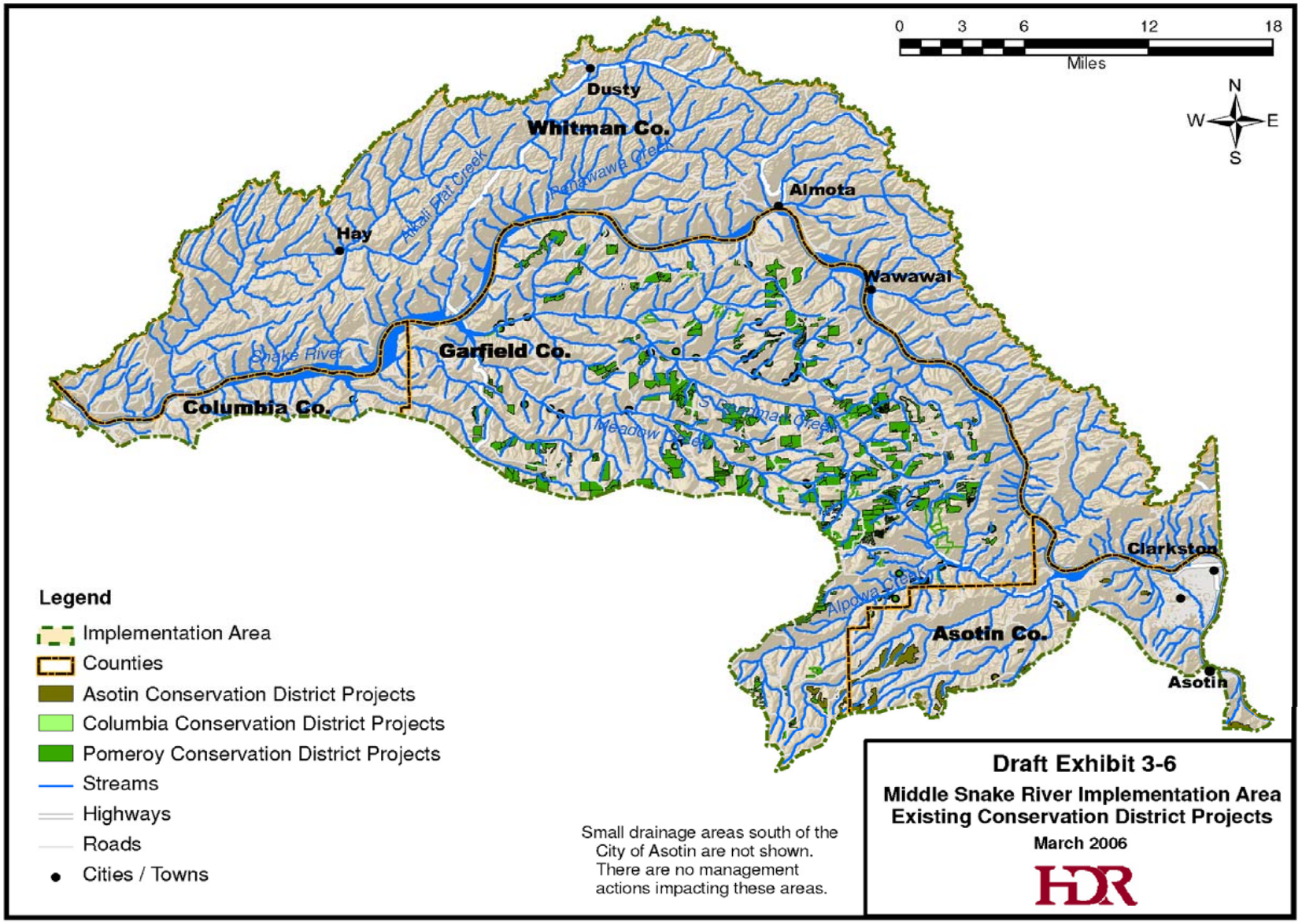
3.3 Middle Snake Mainstem Implementation Area

The Middle Snake Mainstem Implementation Area extends north from the Oregon border through a narrow corridor along the Snake River and is bounded in the north by WRIA 34 (Palouse Watershed). The watershed is impounded by Lower Granite Dam (RM42) and Little Goose Dam (RM 70) on the Snake River. The Middle Snake IA drains an area of approximately 1,102 square miles. Some of the major tributaries within the area include Alkali Flat Creek, Penawawa Creek, Almota Creek, Alpowa Creek, Deadman Creek and Meadow Creek.

The USACE controls some public lands adjacent to the reservoirs, with a few isolated parcels owned by the State of Washington. Most of the lands adjacent to the Snake River through this area are privately owned. Agriculture is the primary land use, which is dominated by non-irrigated farming in the uplands, irrigated farming in the valleys, and cattle ranching. A relatively small timber harvest occurs on portions of the forested upper watershed. The population in the IA is expected to increase from 22,244 in the year 2005 to 26,298 in 2025. The City of Clarkston represents the only significant urban development and represents approximately 87 percent of the total IA population. It is expected that roughly 90 percent of the population will reside in Clarkston by 2025.

3.3.1 Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Pomeroy County Conservation District. Exhibit 3-6 illustrates the approximate geographic distribution of existing Pomeroy Conservation District projects, as well as depicting the general types of projects completed.


0 3 6 12 18
Miles
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W E
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Dusty
Whitman Co.
Almota
Hay
Wawawai
Garfield Co.
Columbia Co.
Clarkston
Asotin Co.
Asotin
Legend
Implementation Area
Counties
Asotin Conservation District Projects
Columbia Conservation District Projects
Pomeroy Conservation District Projects
Streams
Highways
Roads
Cities / Towns
Small drainage areas south of the City of Asotin are not shown. There are no management actions impacting these areas.
Draft Exhibit 3-6
Middle Snake River Implementation Area
Existing Conservation District Projects
March 2006
HDR

3.3.2 Water Quantity

The major categories of water users are major public water systems (City of Clarkston), small public water systems, self-supplied commercial/industrial users (primarily in the Clarkston urban area, but not supplied by Asotin PUD), individual household wells, agricultural water users. Although a majority of the population resides in Clarkston, pasture and rangeland, cropland, and forestland are the predominant land uses. Consequently, most water use is associated with agriculture.

Surface and Groundwater Rights

Tables 3-7 and 3-8 provide summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights, respectively. Water rights with irrigation being one of the purposes of use accounts for over 80 percent of the total annual water rights allocated. Approximately 82 percent of the water rights, in terms of annual volume limits, are associated with groundwater sources.

Table 3-7
Summary of Surface Water Rights[1] for Middle Snake

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (cfs)
Irrigation	35	4,313.73	26.77
Stock Watering	6	6.00	0.12
Domestic Single* / Irrigation, Stock Watering	6	234.70	0.91
Commercial and Industrial Manufacturing / Environmental Quality / Fire Protection	1	100.00	0.80
Commercial and Industrial Manufacturing / Irrigation / Stock Watering	1	31.60	0.15
Fish Propagation / Irrigation / Stock Watering	2	51.38	5.68
Recreational / Stock Watering	1	2.00	0.02

Notes:

1 The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights since they have not yet been approved.

***-Domestic Single (one dwelling with lawn and garden, up to one-half acre)*

Table 3-8
Summary of Ground Water Rights[1] for Middle Snake River IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (gpm)
Irrigation	38	7053.26	16043
Domestic Single/Irrigation/Stock Watering	34	1896.01	2882
Domestic Multiple/Irrigation/Stock Watering	16	831.2	1686
Commercial & Industrial Manufacturing/Domestic Multiple/Domestic Single/Irrigation	20	3445.18	4450
Domestic Single	4	13	38.5
Commercial & Industrial Manufacturing	2	34.5	570
Domestic Single/ Power	2	967.8	600
Commercial & Industrial Manufacturing/Domestic General/Domestic Single/Domestic Multiple / Environmental Quality /Fire Protection/Stock Watering	2	201	250
Commercial & Industrial Manufacturing/ Domestic Multiple/Fish Propagation / Irrigation	1	292.29	300
Domestic General / Railway	1	15.35	220
Domestic Multiple/ Fire Protection / Irrigation	1	60.26	125
Domestic Multiple/ Heat Exchange	1	3	45
Domestic Single / Fire Protection/ Irrigation / Stock Watering	4	148.9	250
Heat Exchange / Irrigation	1	71	250
Irrigation / Domestic Municipal	2	6330	4400

Notes:

The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There is no feasible means of evaluating the validity, or documenting the amount of, water associated with claims. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights, since they have not been approved.

Future Water Demand

Future water demand for municipal and residential use was calculated by using population forecasts, land use, and per capita demand and is presented in Table 3-9.

Table 3-9
Average Annual Volume Projection for Middle Snake IA
(acre feet per year)

	Clarkson Urban Area	Rural Asotin Co.	Rural Columbia Co.	Rural Garfield Co.	Rural Whitman Co.
1990	4,690	-	-	-	-
1995	5,083	-	-	-	-
2000	5,437	54	11	152	272
2005	5,719	47	11	153	273
2010	6,001	53	11	153	275
2015	6,283	50	11	153	273
2020	6,597	46	11	153	273
2025	6,934	33	11	153	273

Approximately 400 acres of cropland are currently irrigated with surface diversions within the IA. These diversions are primarily located on Alkali Flat Creek and Alpowa Creek, with smaller diversions from Deadman, Almota, and Meadow Creeks. About 22 percent of all irrigation demand is met through surface water diversions; the remaining 78 percent comes from groundwater withdrawals. Agricultural growth in this area is expected to be limited due to the amount of additional land suitable and available for cultivation and the uncertainty of agricultural crop markets.

3.3.3 Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

The Level 1 WRIA 35 Assessment included information regarding instream flow gauges. Table 3-10 includes an updated list of gauge locations that have produced data that was used in development of minimum instream flow recommendations.

Proposed SWSLs for the IA include closures and restrictions at the management points, as well as minimum instream flows and flow enhancement targets will be included in Exhibit 3-7 of the final watershed plan.

Table 3-10
WRIA 35 Gauge ID Matrix for Middle Snake River Implementation Area

Gauge No.	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
12	Lower Snake Mainstem	WSU	Lower Deadman	Lower Deadman Creek at Wilson's Banner Ranch	Spot Flow Data	2003
13	Lower Snake Mainstem	WSU	Upper Deadman	Upper Deadman Creek at Gould City, Downstream of North-South Fork Confluence	Spot Flow Data	2003
14	Lower Snake Mainstem	WSU	Lower Meadow	Meadow Creek near SR 127-Meadow Creek Road Intersection.	Spot Flow Data	2003
15	Lower Snake Mainstem	WSU	Upper Meadow	Meadow Creek at Ben Day Gulch Bridge	Spot Flow Data	2003
16	Lower Snake Mainstem	WSU	Alpowa	Alpowa Creek at Wilson's Banner Ranch	Spot Flow Data	2003
17	Lower Snake Mainstem	USGS	13334300	Snake River near Anatone	Real-Time	1959-2002; 1992-Present
18	Lower Snake Mainstem	USGS	13343500	Snake River near Clarkston	Daily Streamflow	1915-1973
19	Lower Snake Mainstem	USGS	13343510	Alpowa Creek at Peola	Peakflow	1971-1977
20	*Lower Snake Mainstem*	*USGS*	*13343590*	*Forebay of Lower Granite Dam (Lower Granite Lake)*	*Real-Time*	*NO DATA*
21	*Lower Snake Mainstem*	*USGS*	*13343595*	*Snake River below Lower Granite Dam (right bank)*	*Real-Time*	*NO DATA*
22	Lower Snake Mainstem	USGS	13343600	Snake River below Lower Granite Dam (left bank)	Daily Streamflow	1978-1985
23	Lower Snake Mainstem	USGS	13343620	South Fork of Deadman Creek, Tributary near Pataha	Peakflow	1961-1976
24	*Lower Snake Mainstem*	*USGS*	*13343855*	*Forebay of Little Goose Dam (Lake Bryan)*	*Real-Time*	*NO DATA*
25	*Lower Snake Mainstem*	*USGS*	*13343860*	*Snake River below Little Goose Dam*	*Real-Time*	*NO DATA*
26	Lower Snake Mainstem	Ecology	35K050	Alpowa Creek at Mouth	Telemetry	June 03-Present
27	Lower Snake Mainstem	Ecology	35L050	Almota Creek at Mouth	Telemetry	June 03-Present
28	Lower Snake Mainstem	Ecology	35M060	Deadman Creek near Mouth	Telemetry	June 03-Present
29	Lower Snake Mainstem	Ecology	35M100	Deadman Creek near Gould City	Telemetry	June 03-Present
30	Lower Snake Mainstem	Ecology	35N050	Meadow Creek at Mouth	Manual Stage Height	June 03-Present
31	Lower Snake Mainstem	USGS	13335200	Critchfield Draw near Clarkston	Peakflow	1959-1976
32	Lower Snake Mainstem	USGS	13343450	Dry Creek at Mouth	Peakflow	1963-1977
33	Lower Snake Mainstem	USGS	13343520	Clayton Gulch near Alpowa	Peakflow	1961-1976
34	Lower Snake Mainstem	USGS	13343660	Smith Gulch, Tributary near Pataha	Peakflow	1955-1974
35	Lower Snake Mainstem	USGS	13343700	Ben Day Gulch, Tributary near Pomeroy	Peakflow	1961-1969
36	Lower Snake Mainstem	USGS	13343790	Meadow Creek, Tributary near Central Ferry	Peakflow	1970-1977
37	Lower Snake Mainstem	USGS	13343800	Meadow Creek near Central Ferry	Daily Streamflow	1963-1974

Exhibit 3-7 Middle Snake River Proposed Water Use Restrictions

THIS EXHIBIT UNDER DEVELOPMENT

3.3.4 Water Quality

The primary water quality concerns in the Snake River mainstem are elevated temperature along the entire length, excessive pH, low dissolved oxygen, increased total dissolved gas, and high toxics levels. Water quality impacts to tributary streams within the IA typically include high summer temperatures, excessive fecal coliform, and low dissolved oxygen.

Table 3-11 shows the most recent 303(d) list of impaired water bodies released by Ecology. All waterbodies on the 303(d) list are classified as Category 5, meaning that Washington's state water quality standards have been exceeded, and there is no existing TMDL or pollution control plan. TMDLs are required for the water bodies in this category, although there are no currently scheduled TMDLs for this IA.

Table 3-11
2004 TMDL and 303(d) Listing Status in the Middle Snake Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
18842	35	Alkali Flat Creek	Temperature	5	None
18841	35	Alkali Flat Creek	Temperature	5	None
18843	35	Alkali Flat Creek	Temperature	5	None
20357	35	Almota Creek	Temperature	5	None
20358	35	Almota Creek	Temperature	5	None
40558	35	Alpowa Creek	Fecal Coliform	5	None
40556	35	Alpowa Creek	Fecal Coliform	5	None
40557	35	Alpowa Creek	Fecal Coliform	5	None
40553	35	Deadman Creek	Fecal Coliform	5	None
18829	35	Deadman Creek	Temperature	5	None
18828	35	Deadman Creek	Temperature	5	None
18827	35	Deadman Creek	Temperature	5	None
40555	35	North Fork Deadman Creek	Fecal Coliform	5	None
40554	35	South Fork Deadman Creek	Fecal Coliform	5	None
40534	35	South Fork Deadman Creek	Temperature	5	None
20360	35	Little Almota Creek	Temperature	5	None
20359	35	Little Almota Creek	Temperature	5	None
18831	35	Meadow Creek	Temperature	5	None
18830	35	Meadow Creek	Temperature	5	None
18840	35	Penawawa Creek	Temperature	5	None
18839	35	Penawawa Creek	Temperature	5	None
18833	35	Steptoe Creek	Temperature	5	None
18834	35	Steptoe Creek	Temperature	5	None
18838	35	Wawawai Creek	Temperature	5	None
19018	35	Snake River	4,4' - DDE	5	None
19017	35	Snake River	4,4' - DDE	5	None
16903	35	Snake River	Dissolved Oxygen	5	None
16927	35	Snake River	Dissolved	5	None

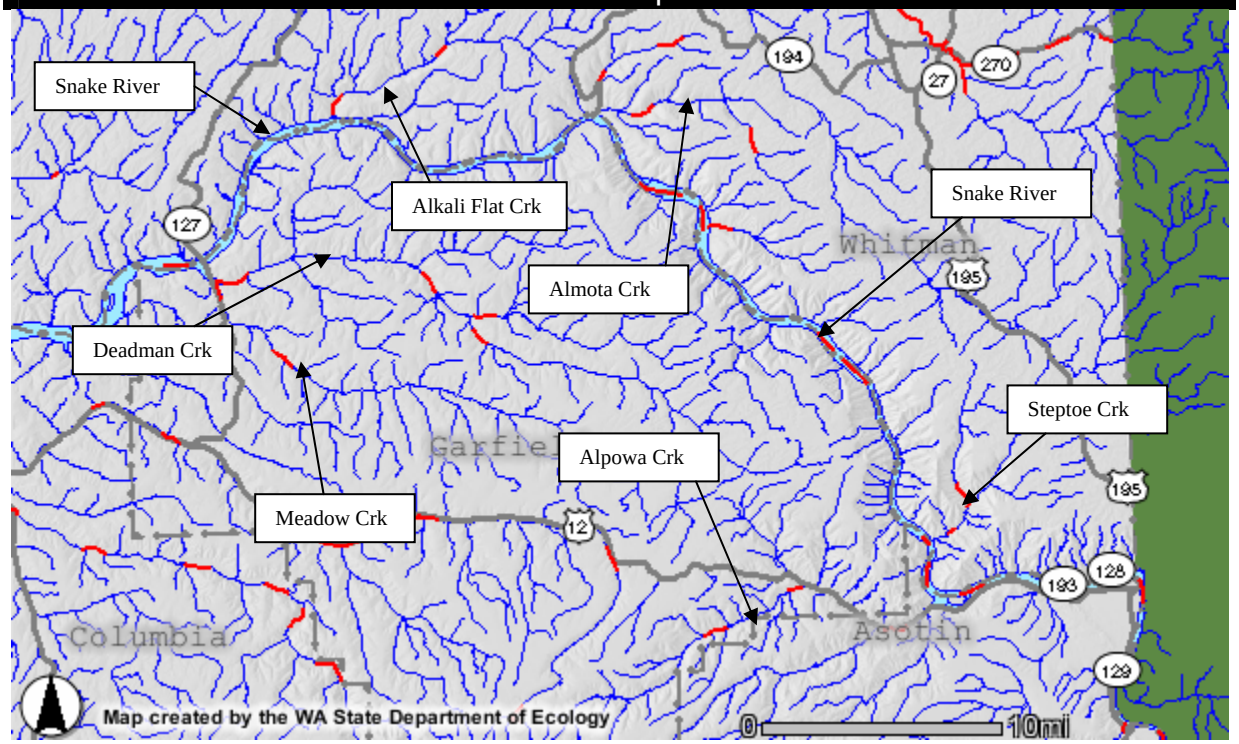
Table 3-11
2004 TMDL and 303(d) Listing Status in the Middle Snake Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
			Oxygen		
16906	35	Snake River	Dissolved Oxygen	5	None
15173	35	Snake River	pH	5	None
15174	35	Snake River	pH	5	None
15175	35	Snake River	pH	5	None
11155	35	Snake River	pH	5	None
16931	35	Snake River	pH	5	None
16911	35	Snake River	Temperature	5	None
16929	35	Snake River	Temperature	5	None
16905	35	Snake River	Temperature	5	None
6307	35	Snake River	Temperature	5	None
6307	35	Snake River	Temperature	5	None
8285	35	Snake River	Temperature	5	None
19120	35	Snake River	Total PCB	5	None
19121	35	Snake River	Total PCB	5	None
18833	35	Snake River	Temperature	5	None
18834	35	Snake River	Temperature	5	None

The polluted waterbodies in this area include the following and to the extent possible are illustrated in Exhibit 3-8.

- Alkali Flat Creek
- Almota Creek
- Alpowa Creek
- Deadman Creek
- North Fork Deadman Creek
- South Fork Deadman Creek
- Little Almota Creek
- Meadow Creek
- Penawawa Creek
- Steptoe Creek
- Wawawai Creek
- Snake River

Exhibit 3-8
2004 303(d) Listed Waterbodies in the
Middle Snake River Implementation Area



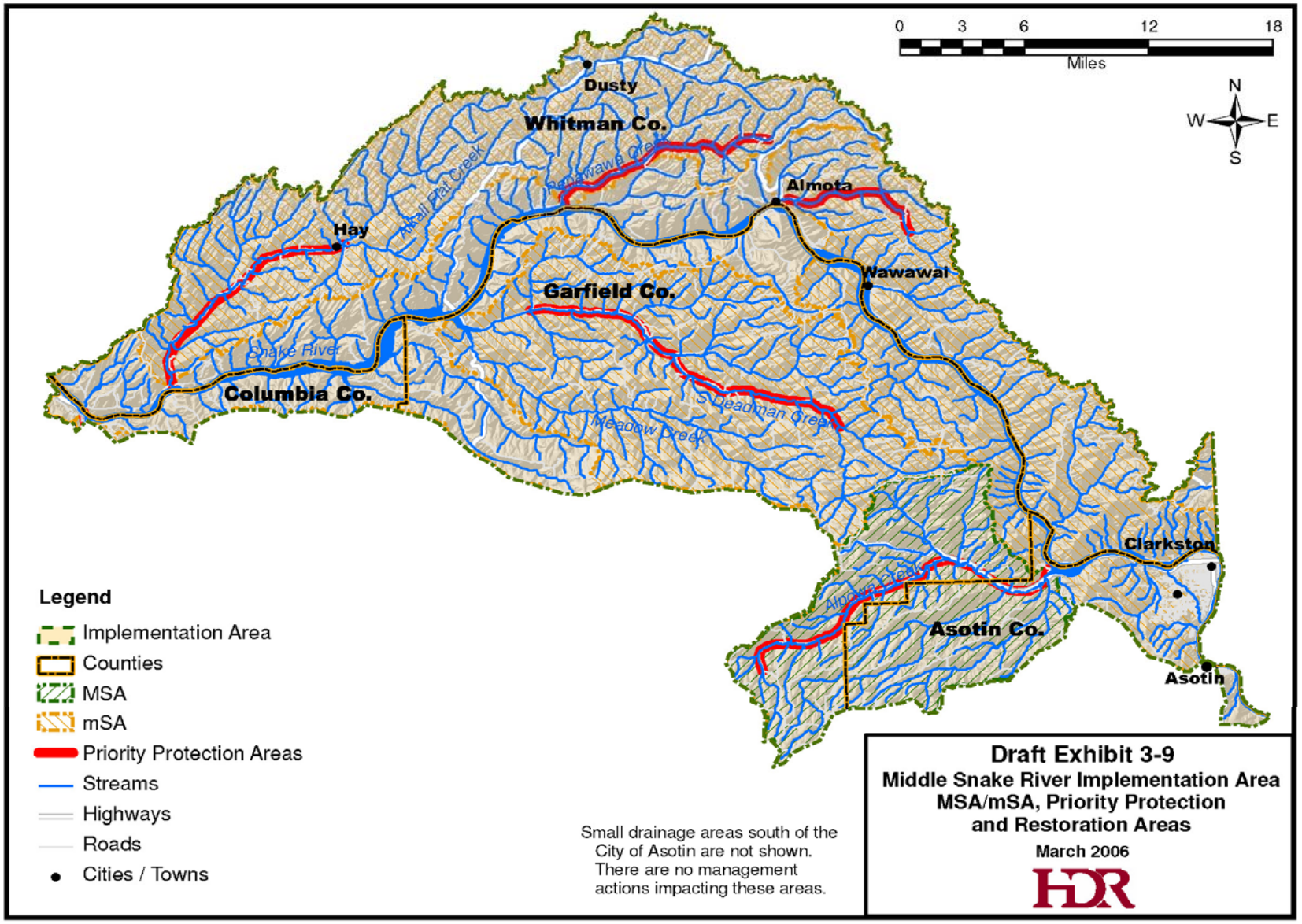
3.3.5 Aquatic Habitat

The SRSRP and LFA have identified the following fish species as focal species within the Middle Snake Implementation Area.

Snake River steelhead	*Oncorhynchus mykiss*
Spring and Summer Chinook	*Oncorhynchus tshawytcha*
Bull trout	*Salvelinus confluentus*

The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area below. Limiting factors for fish were determined using EDT. The EDT process and specific details regarding the analysis may be found in the SRSRP. More information is also available in the LFA.

Exhibit 3-9 shows MSA/mSA's, imminent threats, and priority protection/restoration areas as described in the SRSRP (2006).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Miles
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Dusty
Whitman Co.
Almota
Hay
Wawawai
Garfield Co.
Columbia Co.
Snake River
Meadow Creek
Steptoe Creek
Clarkston
Asotin Co.
Asotin
Legend
Implementation Area
Counties
MSA
mSA
Priority Protection Areas
Streams
Highways
Roads
Cities / Towns
Small drainage areas south of the City of Asotin are not shown. There are no management actions impacting these areas.
Draft Exhibit 3-9
Middle Snake River Implementation Area
MSA/mSA, Priority Protection and Restoration Areas
March 2006
HDR

Snake River Mainstem

Primary factors that limit salmon productions within the Snake River mainstem include factors from dams (i.e., altered river conditions, increased dissolved gas, reduced passage), factors from harvest (i.e., reduced numbers of adult spawners), and factors from hatcheries (i.e., increased predation, increased disease, and altered genetics).

Snake River Tributaries

Within the Middle Snake IA, EDT habitat assessments were completed for Almota Creek and Deadman Creek. It was assumed that the habitat conditions in these streams were similar to conditions in six other small tributaries that were not analyzed including Alkali Flat Creek, Alpowa Creek, Penawawa Creek, Steptoe Creek, and Wawawai Creek. The habitat factors most impacting abundance and productivity were sediment, low flow, reduced pool habitat, poor habitat diversity associated with scarce large woody debris and anthropogenic confinement, poor riparian function, excessive temperature, and passage obstructions.

Causes of Impacts to Almota and Deadman Creeks: Most of the limiting factors are the direct or indirect result of the impacts of roads and agricultural practices, including grazing and cropping, on the riparian zone and associated uplands. Sedimentation and low flows were attributed to crop production and grazing near the riparian corridor and in the uplands. Crop production often entails leaving the fields fallow in the summer which augments erosion potential of the riparian and upland areas. Reduced pool habitat was attributed to the scarcity of woody debris due to riparian degradation caused by crop production, grazing and roads.

3.4 Pataha Creek Implementation Area

The Pataha Creek Implementation Area is located near the center of WRIA 35 and follows the path of Pataha Creek, which runs roughly southeast to northwest. Pataha Creek drains 114,166 acres (185 square miles) and drains into the Tucannon River at River Mile 11.2. Major tributaries of Pataha Creek are seasonal streams that include Dry Pataha Creek, Sweeney Gulch, Bihmaier Gulch, Linville Creek, Tatman Gulch, and Dry Hollow. The primary land use is non-irrigated cropland farming and livestock production. Most of the irrigated cropland is located in the valley adjacent to Pataha Creek. Major jurisdictions in the area include Garfield County, Columbia County, and the USFS (Umatilla National Forest). The primary urban area is the City of Pomeroy, located on Pataha Creek in the northeastern portion of the IA. The population is anticipated to increase within the IA from 2,825 in the 2005 to 3,055 by the year 2025. Approximately 54 percent of the population currently resides in the City of Pomeroy; this is expected to increase to roughly 58 percent by 2025.

3.4.1 Historical, Current and Ongoing Watershed Activities

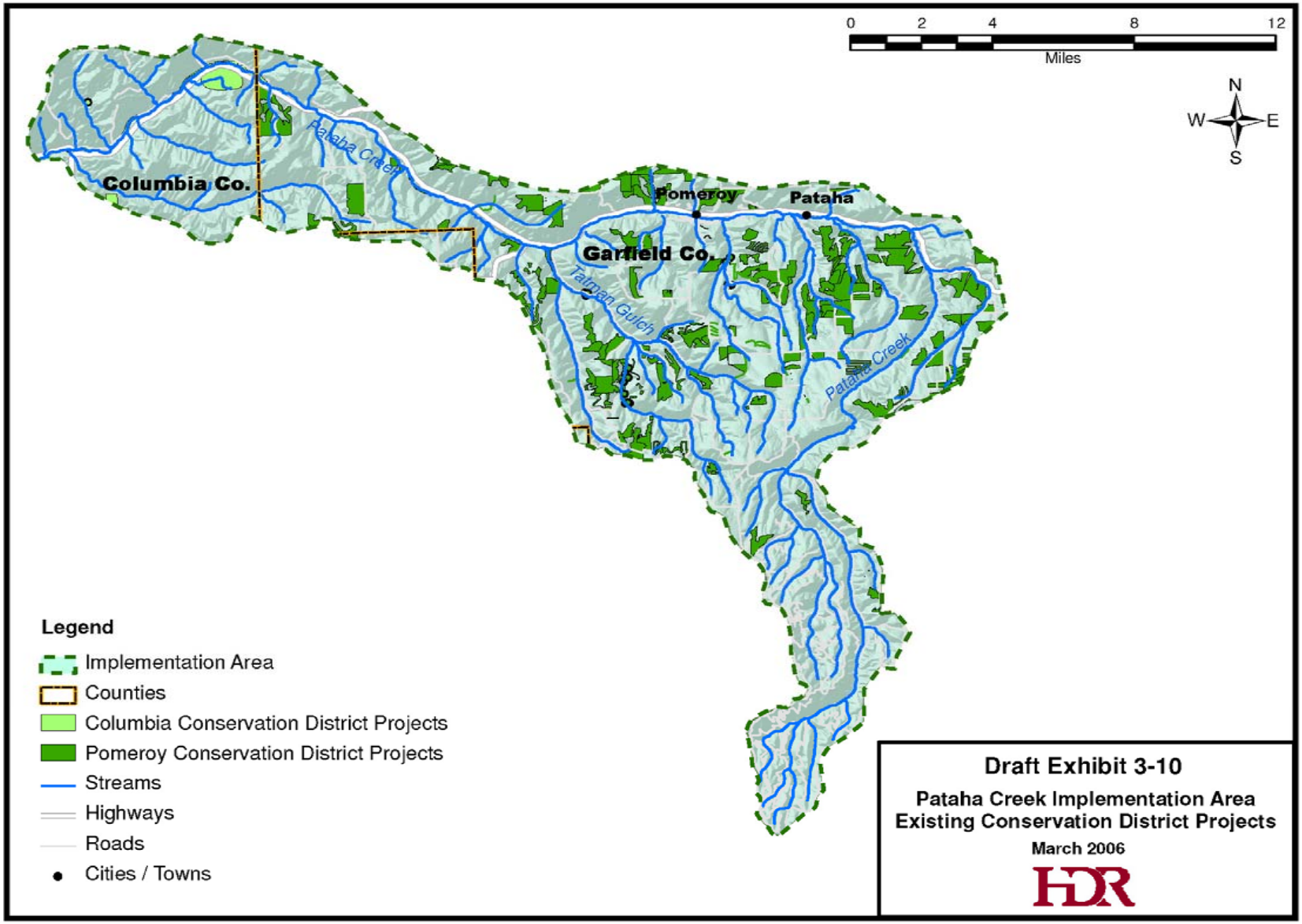
In 1993, BPA funded the Pataha Creek Model Watershed Project for implementation of watershed activities in the subbasin. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Pomeroy County Conservation District. While not exhaustive, Table 3-12 and Exhibit 3-10 demonstrates the extensive level of watershed activity in the IA.

Table 3-12
Pataha Creek Watershed Planning and Implementation Activities, 1980s-Present

Date	Activity and/or Accomplishment
1993-present	Water quality monitoring on Pataha, Deadman and Alpowa Creeks
1998	Deep fall subsoiling on 1,130 acres; no-till seeding on 1,453 acres; two pass seeding on 795 acres; 4.2 acres of critical area seeding; 15 sediment basins constructed; divided slopes installed on 128 acres; 26,760 feet of upland and riparian fencing installed; 24.4 acres of upland buffers established; 3.67 acres of riparian buffers established; 79 acres of grasses and legumes introduced into rotation; 13,551 feet of grass waterways established; 6,949 feet of pipeline installed for alternative stock watering source; 100 feet of streambank protection
1999	Deep fall subsoiling on 1,933 acres; no-till seeding on 2,185 acres; two pass seeding on 1,974 acres;
	17 sediment basins constructed; 1 riparian fence installed on 1 acre ; 4.6 acres of upland buffer strip established; 3,433 feet of grassed waterway established; 150 feet of streambank protection ; 18,268 feet of terraces rebuilt and/or constructed; 10,000 willow and cottonwood whips and poles planted
1999-2002	689 acres and 56 miles of streambank enrolled in CREP program
1999-2005	Information and education programs (newspaper articles, newsletters; fish aquarium at local grade school with hatched trout released into local pond).
2003	No-till seeding on 1,173 acres; direct seeding on 930.6 acres; 1500 feet of fencing installed; ongoing water quality monitoring (since 1993); 163 acres and 13 miles of streambank (66,226 feet) enrolled in CREP program; 81,000 trees planted in riparian buffer zone.
2003-05	23 water quality projects underway to remove livestock winter-feeding and concentrated areas away from streams; began activities to control False Indigo invading county streams
2004	No-till seeding on 1,483.8 acres; direct seeding on 1487.6 acres; 74.4 acres planted in pasture and hay; 2 sediment basins constructed; 16 irrigation water usage meters installed
2005	No-till seeding on 961 acres; direct seeding on 238 acres; 5 sediment basins constructed; 84 additional acres enrolled in CREP program; 8 miles of riparian fencing constructed; 4,300 trees planted; 16.38 miles of stream bank protected; 83.5 acres of riparian buffers established; 3 alternative water systems developed; weed control, fence and water system repair, and grass reseeding projects conducted; 2 irrigation efficiency surveys conducted
Notes:	
Bartels, Duane, "Pataha Creek Model Watershed", Project No. 1999-02100, 27 electronic pages, (BPA Report DOE/BP-14994-1); Bartels, Duane, "Pataha Creek Model Watershed", Project No. 1994-01807, 26 electronic pages, (BPA Report DOE/BP-12585-1); 2003, 2004, 2005 Reports of Accomplishments, Pomeroy Conservation District	

3.4.2 Water Quantity

The primary categories of water use in the area are major public water systems (City of Pomeroy), small public water systems, self-supplied commercial/industrial users, individual household wells; and agricultural water users. Because the primary land uses are connected with agriculture (i.e. pasture and rangeland, cropland, and forestland), the City of Pomeroy represents only a relatively small overall water demand, while the most significant water use is associated with agricultural.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Pataha
Garfield Co.
Tatman Gulch
Pataha Creek
Legend
Implementation Area
Counties
Columbia Conservation District Projects
Pomeroy Conservation District Projects
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 3-10
Pataha Creek Implementation Area
Existing Conservation District Projects
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Surface and Groundwater Rights

Tables 3-13 and 3-14 provide summaries of the types of use and associated quantities for surface and ground water permitted and certificated water rights, respectively. Water rights with irrigation being one of the purposes of use accounts for over 60 percent of the total annual water rights allocated. Almost 60 percent of the water rights in terms of annual volume limits are associated with surface water sources.

Table 3-13
Summary of Surface Water Rights[1] for Pataha Creek IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (cfs)
Irrigation	7	625.00	2.94
Domestic Multiple	2	552.00	0.76
Domestic Single	2	1.00	0.02
Domestic Multiple, Stock Watering, Wildlife Propagation	1	10.00	0.21
Domestic Single, Stock Watering	2	4.00	0.03

Notes:

1 The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights since they have not yet been approved.

Table 3-14
Summary of Ground Water Rights[1] for Pataha Creek IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (gpm)
Irrigation	11	1003.3	1814
Domestic Single*, Irrigation, Stock Watering	16	908.28	2710
Domestic Multiple**, Irrigation	5	62.69	120
Commercial & Industrial Manufacturing	2	40	185
Domestic Municipal	2	278	1250
Domestic General***/Railway	1	4.59	50

Notes:

(1) The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There is no feasible means of evaluating the validity, or documenting the amount of, water associated with claims. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights, since they have not been approved.

- ***-Domestic Single (one dwelling with lawn and garden, up to one-half acre)***
- ****** *Domestic Multiple (more than one dwelling none of which are under municipal control)*
- ******* *General (use of water for all domestic uses not specifically defined in the water right record or not defined by the other specific domestic use categories.*

Future Water Demand

Future demand for municipal and residential use was calculated using population forecasts, land use, and per capita demand and is presented in Table 3-15.

Table 3-15
Average Annual Volume Projections
for Pataha Creek Implementation Area
(Acre feet per year)

	City of Pomeroy	Rural Columbia Co.	Rural Garfield Co.
1990	-		
1995	-		
2000	431	11	59
2005	462	11	59
2010	470	11	59
2015	476	11	59
2020	493	11	59
2025	510	11	59

Current water rights data indicate that approximately 800 to 900 acres are being irrigated within the Pataha Creek IA. Primary crops include grass hay, alfalfa hay, and grain. Surface water is primarily diverted from Pataha Creek, while most groundwater is withdrawn from wells near Pataha Creek. Approximately 78 percent of irrigation demand is met through groundwater withdrawals.

The limited amount of additional land available for cultivation and the uncertainty of agricultural crop markets will likely prohibit future agricultural development. Consequently, irrigation water demand is expected to remain constant over time.

3.4.3 Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

The Level 1 WRIA 35 Assessment included information regarding instream flow gauges. Table 3-16 includes an updated list of gauge locations that have produced data that was used in development of minimum instream flow recommendations.

Proposed SWSLs for the IA include closures and restrictions at the management points, as well as minimum instream flows and flow enhancement targets will be included in Exhibit 3-11 of the final watershed plan.

Table 3-16

WRIA 35 Gauge ID Matrix for Pataha Creek Implementation Area

Gauge No.	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
38	Pataha	WSU	Pataha 1	Pataha Creek near Mouth	Spot Flow Data	1998-2001; 2003
39	Pataha	WSU	Pataha 3	Pataha Creek near Pomeroy	Spot Flow Data	1998-2001; 2003
40	Pataha	WSU	Pataha 5	Pataha Creek (headwater area)	Spot Flow Data	1998-2001; 2003
41	Pataha	Ecology	35F050	Pataha Creek near Mouth	Telemetry	June 03-Present
42	Pataha	Ecology	35F100	Pataha Creek near Pataha	Manual Stage Height	June 03-Present

Exhibit 3-11 Pataha Creek Proposed Water Use Restrictions

THIS EXHIBIT UNDER DEVELOPMENT

3.4.4 Water Quality

Elevated stream temperature and excessive fecal coliform concentrations were the primary water quality concerns in Pataha Creek, as identified in the Level I Assessment. In addition, total suspended solids concentrations, turbidity, and high pH levels are also of concern as potential limiting factors to salmonid rearing in the lower and middle portions of Pataha Creek. Pataha Creek has been identified as a major contributor of sediment to the Tucannon River.

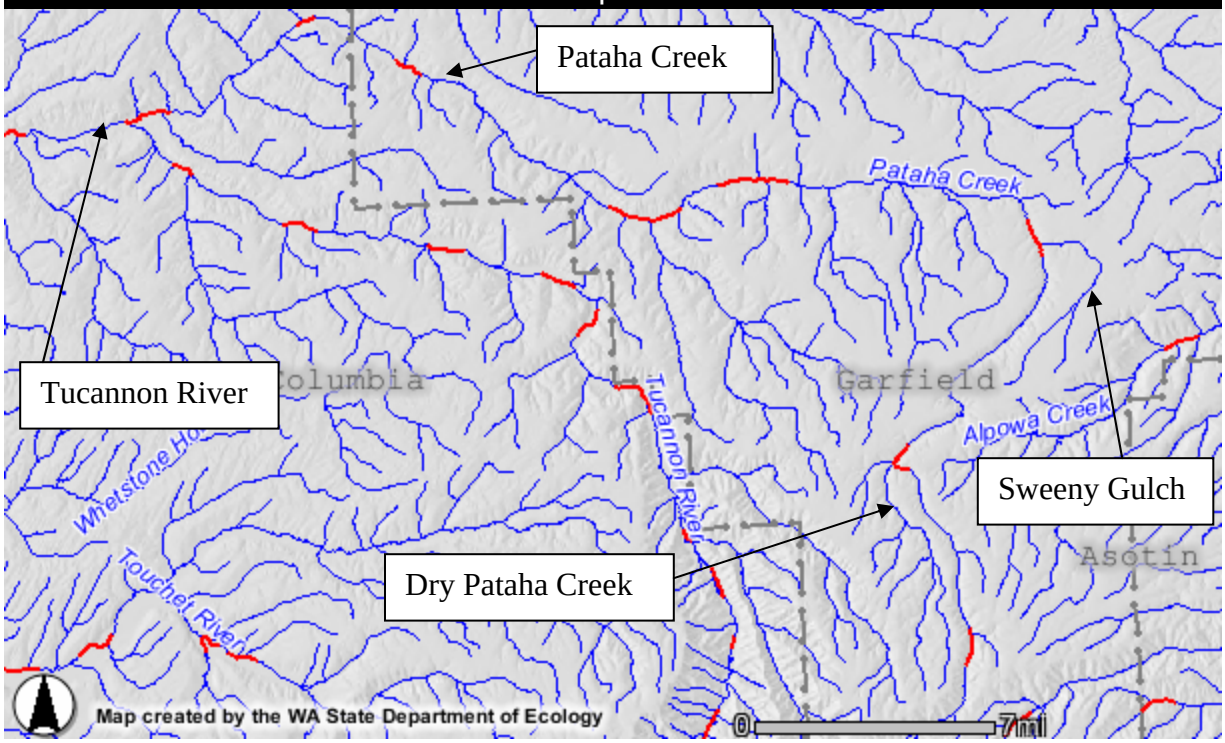
Table 3-17 shows the most recent 303(d) list of impaired water bodies released by Ecology. All waterbodies on the 303(d) list are classified as Category 5, meaning that Washington's state water quality standards have been exceeded, and there is no existing TMDL or pollution control plan. TMDLs are required for the water bodies in this category. Although no TMDLs are yet underway for this area, the WRIA 35 Planning Unit has requested that Ecology begin the TMDL process for temperature in the Tucannon River sooner than scheduled.

Table 3-17
2004 TMDL and 303(d) Listing Status in the Pataha Creek Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
16797	35	Pataha Creek	Fecal Coliform	5	None
10455	35	Pataha Creek	Fecal Coliform	5	None
40550	35	Pataha Creek	Fecal Coliform	5	None
40551	35	Pataha Creek	Fecal Coliform	5	None
40548	35	Pataha Creek	Fecal Coliform	5	None
40549	35	Pataha Creek	Fecal Coliform	5	None
42532	35	Pataha Creek	Fecal Coliform	5	None
11141	35	Pataha Creek	pH	5	None
22436	35	Pataha Creek	Temperature	5	None
22437	35	Pataha Creek	Temperature	5	None
13847	35	Pataha Creek	Temperature	5	None
40531	35	Pataha Creek	Temperature	5	None
40528	35	Pataha Creek	Temperature	5	None
40530	35	Pataha Creek	Temperature	5	None
40529	35	Pataha Creek	Temperature	5	None

Pataha Creek is the only waterbody included on the 303(d) list. The locations of the water quality impairments in this IA are illustrated in Exhibit 3-12.

Exhibit 3-12
2004 303(d) Listed Waterbodies in the
Pataha Creek Implementation Area



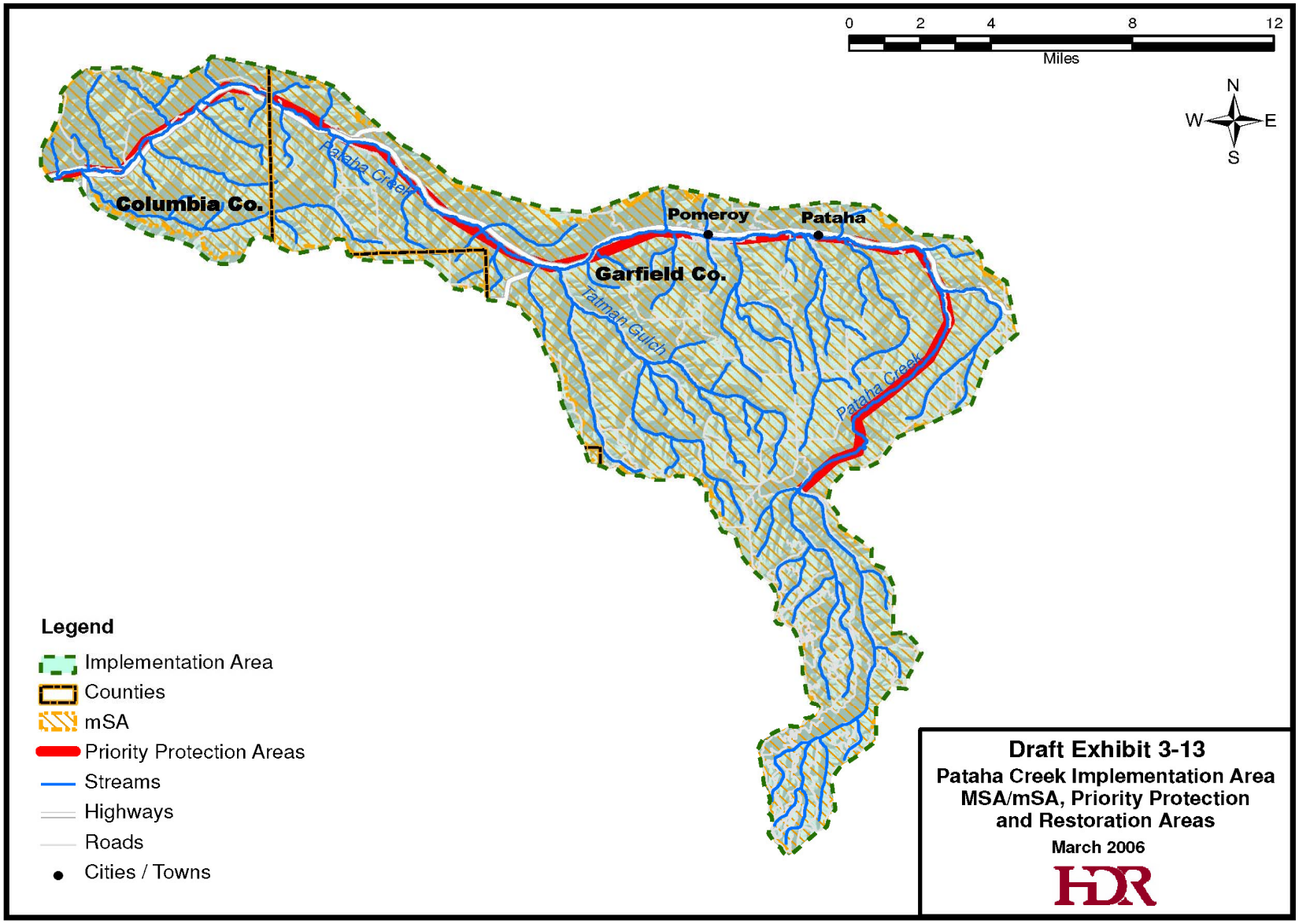
3.4.5 Aquatic Habitat

The SRSRP and LFA have identified the following fish species as focal species within the Pataha Creek Implementation Area.

Snake River steelhead	*Oncorhynchus mykiss*
Spring and Summer Chinook	*Oncorhynchus tshawytcha*
Bull trout	*Salvelinus confluentus*

The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area below. Limiting factors for fish were determined using EDT. The EDT process and specific details regarding the analysis may be found in the SRSRP. More information is also available in the LFA.

Exhibit 3-13 shows MSA/mSA's, imminent threats, and priority protection/restoration areas as described in the SRSRP (2006).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Garfield Co.
Tatman Gulch
Pataha Creek
Legend
Implementation Area
Counties
mSA
Priority Protection Areas
Streams
Highways
Roads
Cities / Towns
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Pataha Creek Implementation Area
MSA/mSA, Priority Protection
and Restoration Areas
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Pataha Creek

Key habitat quantity and sedimentation are the primary limiting factors for summer steelhead in the Pataha Creek. Habitat diversity, flow, channel stability, predation, pathogens, and temperature are listed as strong secondary limiting factors.

The EDT analysis showed the largest proportion of the impacts to spring/summer Chinook populations is attributed to temperature, a lack of key habitat quantity, sedimentation, and a lack of habitat diversity. Channel stability, flow, food, pathogens, and predation were had lesser impacts to Chinook habitat. The impact of temperature is most pronounced below the City of Pomeroy.

Migrating adults of both species are partially blocked by the Delaney culvert on the lower Pataha and the 20th Street (Pomeroy) sewer line in lower Pataha Creek. Steelhead adults are partially blocked by dams on Bihmaier and Dry Pataha creeks as well.

Causes of Impacts to Pataha Creek: Much of the sedimentation problem in Pataha Creek is attributable historical forest management and to agricultural practices. A poorly designed road system in the Pataha watershed also increases erosion and does not provide adequate settling basins for runoff. Low habitat diversity is primarily caused by a lack of large woody debris, channel confinement and, and poor riparian function. These factors result from crop production and grazing practices, decimation of beaver populations, past logging operations, and a series of catastrophic floods. Temperature problems are attributable to riparian damage upstream (reduced shading), low flows caused by hydrological disruption of the upper watershed, and to upstream irrigation diversions.

The lower ten miles of Pataha Creek, from the town of Dodge to the Tucannon confluence, has downcut through 20 to 25 feet of fine sediments to expose raw bedrock. This downcutting is the result of historical overgrazing, as well as stream channelization designed to protect croplands within the floodplain.

Residential development also affects fish habitat in the Pataha drainage. City of Pomeroy roads and infrastructure are located within the floodplain. Within Pomeroy, significant portions of the streambank have been converted to vertical walls reinforced with concrete or riprap. The stream has been straightened and downcut, and there is no floodplain function.

3.5 Tucannon River Implementation Area

The Tucannon River Implementation Area is located along the western boundary of WRIA 35 and consists of all the tributaries to the Tucannon River except Pataha Creek. Pataha Creek is the largest tributary to the Tucannon River and is addressed as a separate implementation area. The Tucannon River drains 318 square miles within the IA, and enters the Snake River at RM 62.2. Most of the area is within Columbia County, with a small portion in Garfield County. The area is also within the Nez Perce Tribe treaty territory. The area is rural, with a 2005 population of approximately 1,454. Approximately 11 percent of the population lives in the City of Starbuck. The population is expected to remain constant through the year 2025. Landuses are primarily range and agricultural lands at lower elevations, higher elevations are mostly forested.

3.5.1 Historical, Current and Ongoing Watershed Activities

Local, state, and federal agencies, as well as tribes and landowners have been involved in watershed planning and implementation activities since the 1980s. Positive changes have been noted over time in watershed conditions due to these activities. Documentation of existing watershed restoration and recovery efforts has been made by the Columbia County Conservation District. While not exhaustive, Table 3-18 demonstrates the extensive level of watershed activity in the IA. Exhibit 3-14 illustrates the approximate geographic distribution of existing Columbia Conservation District projects, as well as depicting the general types of projects completed.

Table 3-18
Tucannon River Watershed Planning and Implementation Activities, 1990s-Present

Date	Activity and/or Accomplishment
1996	1 sediment basin constructed; 3100 feet of riparian fence constructed; 1 pipeline installed for alternative livestock watering; 2 troughs constructed; 1 solar pump installed; 1 basin dike constructed; 160 feet of dike installed; 20 feet of drain pipe installed; 300 feet of drain tiles installed; 1 off-channel rearing structure established; 500 feet of dike removed; 2,685 feet of stream channel reshaped; 59 wads used for revetment material for streambank stabilization/rehabilitation; 38 rock barbs installed; 6 rootwads installed; 500 feet of sloped bank constructed; 1 spillway constructed; 9 vortexes constructed
1997	625 acres of direct seed planted; 67.9 acres stripcropped; 1096 feet of terrace reconstructed; 14,954 feet of riparian fence constructed; 400 feet of snags and riparian area cleared; 7,228 feet of fish stream improvements constructed; 400 feet of streambank protection measures taken; 1 irrigation system withdrawn from stream; 1,520 feet of stream rehabilitated with large woody debris; 1 log jam created for aquatic habitat; 2 off-channel rearing structures established; 1 spring channel preserved for off-channel rearing; 112 wads used as revetment material; 58 rock barb/rootwads installed; 200 feet of dike shaped; 6 vortexes constructed
1998	2509 acres of direct seed planted; 1.6 acres of grassed waterways constructed; 2859 feet of pipeline installed for alternative livestock watering; 1 spring development constructed; 2 troughs constructed; 125 riparian trees planted; 9,502 feet of fish stream improvements constructed; 1 cut-off trench constructed; 6 log barbs installed; 1 log jam constructed for aquatic habitat; 2 off-channel rearing structures established; 68 wads used as revetment material; 59 rootwads installed; 18 rock vanes installed; 15 vortexes constructed
1999	2749 acres of direct seed planted; 2 sediment basins constructed; 1.1 acres of grassed waterways constructed; 10,560 riparian trees planted; 6,486 feet of fish stream improvements constructed; 450 feet of streambank protection measures taken; 32 vanes installed; 4 large woody debris placements; 1 off-channel rearing structure established; 250 feet of revetment materials installed to reduce streambank erosion; 3 rock sills established; 114 rootwads installed; 9 vortex weirs installed
2000	1115 acres of direct seed planted; 75,076 riparian trees planted; 6,515 feet of fish stream improvements constructed; 13 vanes installed; 1,401 feet of stream rehabilitated with large woody debris; 1 log jam installed for aquatic habitat; 520 feet of revetment materials installed to reduce streambank erosion; 5 rootwads installed; 7 vortex weirs installed; 11 acres of riparian forest buffers established; 11 acres of riparian use exclusion established
2001	1332 acres of direct seed planted; 96 feet of upland fencing constructed; 1 spring development constructed; 48,275 riparian trees planted; 2,135 feet of fish stream improvements constructed; 8 vanes installed; 150 feet of stream rehabilitated with large woody debris; 1 log jam installed for aquatic habitat; 835 feet of revetment materials installed; 308 rootwads installed; 4 vortex weirs installed; 156 acres of forest riparian buffer established; 123 acres of riparian use exclusion established; 4 troughs constructed; 4 pipelines for alternative livestock watering constructed; 1 well drilled; 3,420 feet of riparian fencing installed; 9.9 acres of conservation cover established
2002	887 acres of direct seed planted; 13.6 acres of conservation cover; 13.6 acres of filter strip planted; 380 feet of pipeline installed for alternative livestock watering; 3 wells drilled; 422 acres of riparian forest buffers established; 350 acres of riparian use exclusion established; 157,758 riparian trees/shrubs planted; 114.acres of conservation cover established; 2 spring developments established; 59,092 feet of

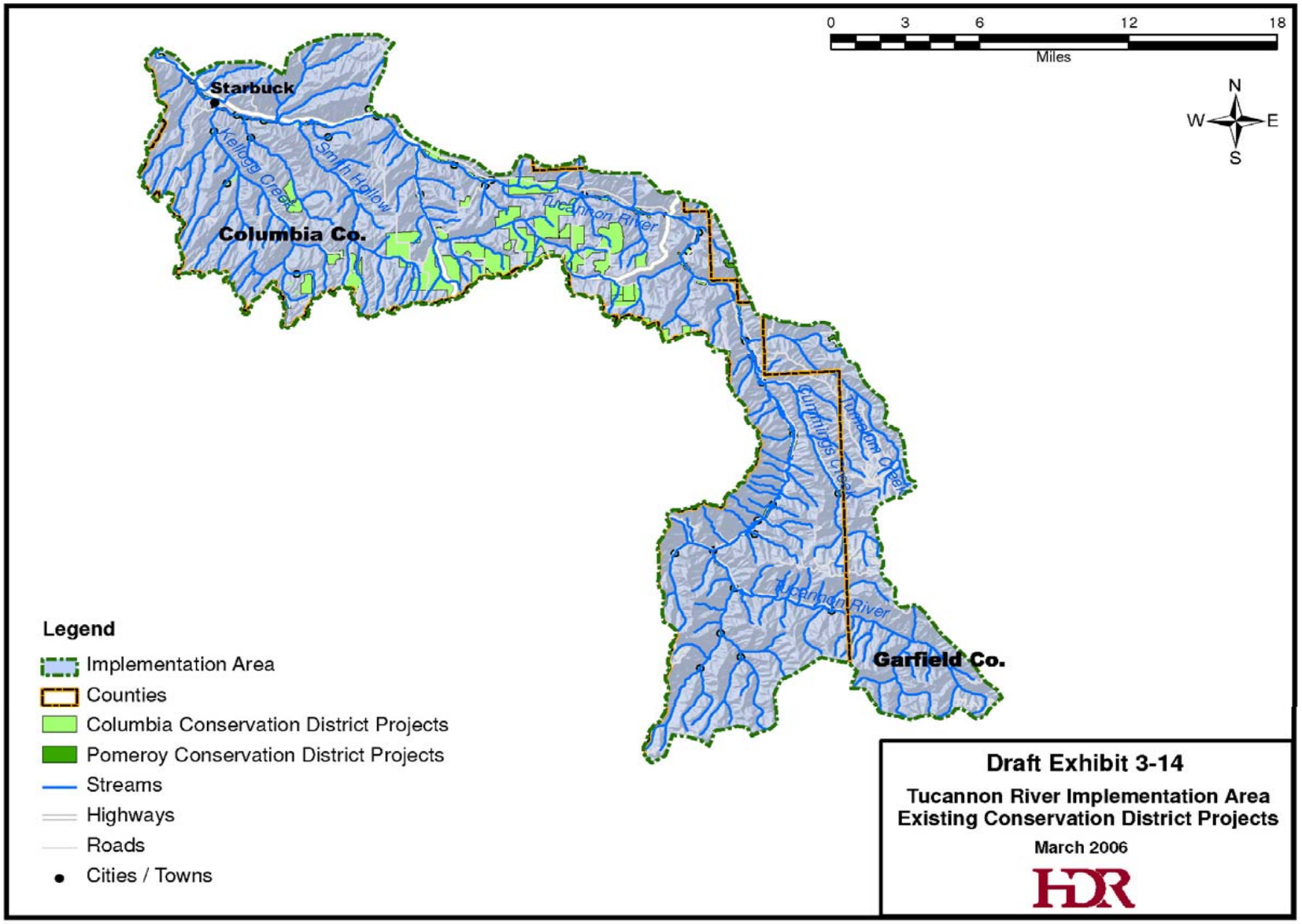
Table 3-18 Tucannon River Watershed Planning and Implementation Activities, 1990s-Present	
Date	**Activity and/or Accomplishment**
	riparian fencing constructed; 22 troughs constructed
2003	421 acres of direct seed planted; 13,215 feet of pipeline installed for alternative livestock watering; 7 troughs constructed; 3 wells drilled; 1188 acres managed for upland habitat; 32 meters installed; 31 fish screens installed; 292 acres of riparian forest buffer established; 292 acres of riparian use exclusion established; 29,635 riparian trees/shrubs planted; 23 acres of conservation cover established; 159 acres of upland wildlife habitat management measures implemented; 8,712 linear feet of mulching established; 27,071 feet of riparian fencing constructed
Source: Columbia Conservation District, Personal Communication, 2006	

3.5.2 Water Quantity

The major categories of water use in the Tucannon River IA are major public water systems (City of Starbuck), small public water systems (Group B), self-supplied commercial/industrial users, individual household wells, and agricultural water users. Water used by the City of Starbuck represents a relatively small portion of the total water use in the area. The primary water use is associated with agriculture, such as crop irrigation and stock watering.

Surface and Groundwater Rights

Tables 3-19 and 3-20 provide summaries of the types of use and related quantities for surface and groundwater permitted and certified water rights respectively. Water rights that have irrigation as one of the purposes of use account for 70 percent of all allocated water rights in the area. Approximately 54 percent of the water rights are associated with surface water use.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Cummings Creek
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Tucannon River
Garfield Co.
Legend
Implementation Area
Counties
Columbia Conservation District Projects
Pomeroy Conservation District Projects
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 3-14
Tucannon River Implementation Area
Existing Conservation District Projects
March 2006
HDR

Table 3-19
Summary of Surface Water Rights for Tucannon River IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (cfs)
Irrigation	7	2,250.00	16.408
Irrigation / Stock Watering	2	849.00	1.33
Domestic Multiple*	1	17.00	0.1
Domestic Single**	1	1.00	0.01
Domestic Single/Stock Watering/ Wildlife Propagation	4	15.50	0.2447
Fire Protection/Irrigation	1	40.00	0.2

Notes:

- *The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There are no annual or instantaneous quantities associated with water right applications.*
  - **--Domestic Multiple (more than one dwelling none of which are under municipal control)*
  - ***-Domestic Single (one dwelling with lawn and garden, up to one-half acre)*

Table 3-20
Summary of Ground Water Rights for Tucannon River IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (gpm)
Domestic Single*/Irrigation	2	161	155
Fish Propagation	2	1440	900
Domestic Municipal	2	566	370
Commercial & Industrial Manufacturing / Domestic Multiple	1	18	158
Irrigation	1	43	100
Irrigation /Stock Watering	1	779	1500
Railway	1	6.14	100

Notes:

(1) The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There is no feasible means of evaluating the validity, or documenting the amount of, water associated with claims. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights, since they have not been approved.

- **Domestic Single (one dwelling with lawn and garden, up to one-half acre)*

Future Water Demand

Future water demand for municipal and residential use was calculated by using population forecasts, land use, and per capita demand and is presented in Table 3-21.

Table 3-21
Average Annual Volume Projections for Tucannon River IA
(acre feet per year)

	City of Starbuck	Rural Columbia Co.	Rural Garfield Co.
1990	39	-	-
1995	38	-	-
2000	38	89	19
2005	38	87	19
2010	38	87	19
2015	38	87	19
2020	38	87	19
2025	38	87	19

A 1995 study completed by the NRCS documented 1,941 acres of irrigated cropland located in the Tucannon River IA. Primary crops include grass hay, alfalfa hay, pasture, wheat and fallow land. Most water used for irrigation is derived from surface water sources. Annual irrigation values were calculated based on the estimated amount of water required for each crop and an average 65% irrigation efficiency. Agricultural activity and associated water use is anticipated to remain relatively constant over time.

3.5.3 Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

The Level 1 WRIA 35 Assessment included information regarding instream flow gauges. Table 3-22 includes an updated list of gauge locations that have produced data that was used in development of minimum instream flow recommendations.

Proposed SWSLs for the IA include closures and restrictions at the management points, as well as minimum instream flows and flow enhancement targets will be included in Exhibit 3-15 of the final watershed plan.

Table 3-22

WRIA 35 Gauge ID Matrix for Tucannon River Implementation Area

Gauge No.	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
43	Tucannon	WSU	TC6	Tucannon River at Cummings Creek Bridge (Spring Lake Campground)	Spot Flow Data	1999-2001
44	Tucannon	WSU	TC9	Tucannon River at Panjab Creek Bridge	Spot Flow Data	1999-2001
45	*Tucannon*	*WSU*	*TC4*	*Tucannon River at Marengo*	*Spot Flow Data*	*NOT IN LEVEL I*
46	Tucannon	USGS	13344500	Tucannon River near Starbuck	Daily Streamflow	1914-1917; 1928-1931; 1958-1990; 1994-Present
47	Tucannon	USGS	13344506	Kellogg Creek, Tributary No. 2 near Starbuck	Peakflow	1970-1978
48	Tucannon	USGS	13344508	Kellogg Creek, Tributary near Starbuck	Peakflow	1964-1969
49	Tucannon	USGS	13344510	Kellogg Creek, Tributary at Starbuck	Peakflow	1963-1964
50	Tucannon	USGS	13344000	Tucannon River near Pomeroy	Daily Streamflow	1913-1930
51	Tucannon	Ecology	35B150	Tucannon River near Marengo	Telemetry	June 2003-Present

Exhibit 3-15 Tucannon River Proposed Water Use Restrictions

THIS EXHIBIT UNDER DEVELOPMENT

3.5.4 Water Quality

The primary water quality issues identified in the Level I Assessment for the Tucannon River are elevated stream temperatures throughout the river and high fecal coliform concentrations near the mouth.

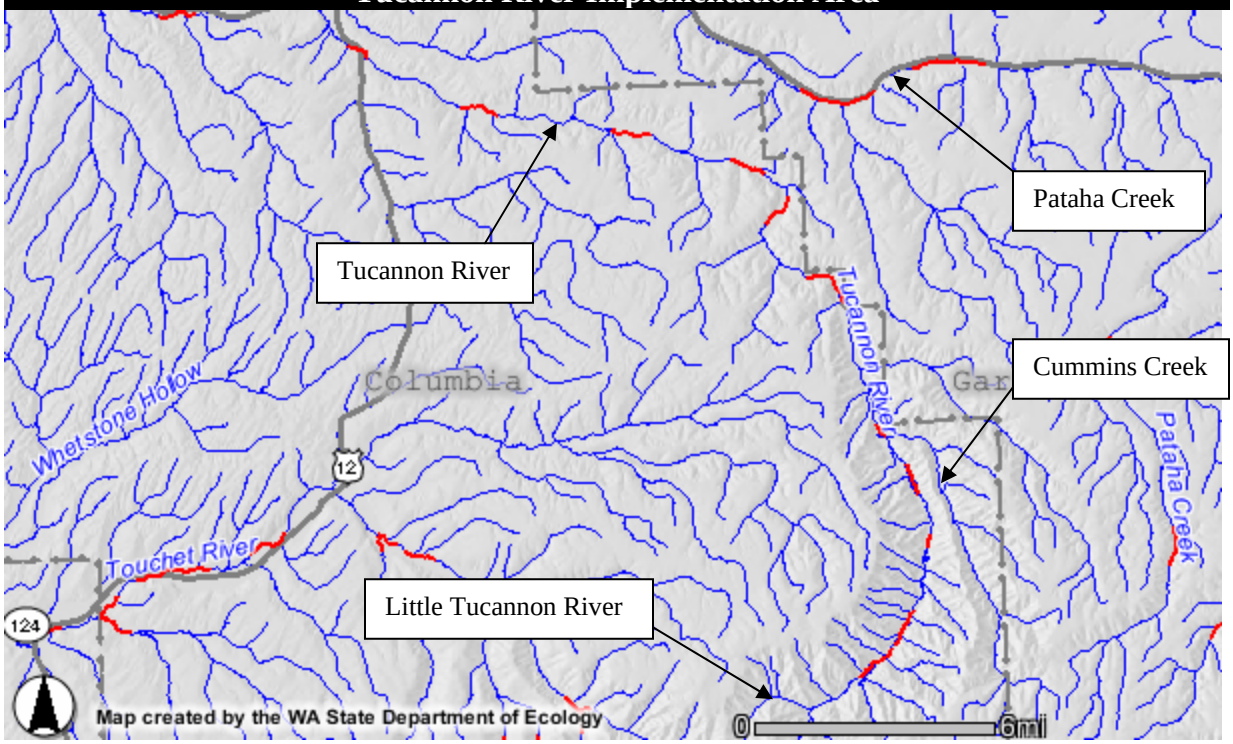
Table 3-23 shows the most recent 303(d) list of impaired water bodies released by Ecology. All waterbodies on the 303(d) list are classified as Category 5, meaning that Washington's state water quality standards have been exceeded, and there is no existing TMDL or pollution control plan. TMDLs are required for the water bodies in this category. Although no TMDLs are yet underway for this area, the WRIA 35 Planning Unit has requested that Ecology begin the TMDL process for temperature in the Tucannon River soon.

Table 3-23
2004 TMDL and 303(d) Listing Status in the Tucannon River Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
16800	35	Tucannon River	Fecal Coliform	5	None
16934	35	Tucannon River	pH	5	None
11144	35	Tucannon River	pH	5	None
11148	35	Tucannon River	pH	5	None
13855	35	Tucannon River	Temperature	5	None
13859	35	Tucannon River	Temperature	5	None
13984	35	Tucannon River	Temperature	5	None
13850	35	Tucannon River	Temperature	5	None
13853	35	Tucannon River	Temperature	5	None
13864	35	Tucannon River	Temperature	5	None
13849	35	Tucannon River	Temperature	5	None
13982	35	Tucannon River	Temperature	5	None
13983	35	Tucannon River	Temperature	5	None
13856	35	Tucannon River	Temperature	5	None
13857	35	Tucannon River	Temperature	5	None
13848	35	Tucannon River	Temperature	5	None
13861	35	Tucannon River	Temperature	5	None
3725	35	Tucannon River	Temperature	5	None
15918	35	Tucannon River	Turbidity	5	None
13865	35	Tucannon River	Temperature	5	None

The Tucannon River mainstem is the only waterbody included on the 303(d) list. The locations of the water quality impairments in this IA are illustrated in Exhibit 3-16.

Exhibit 3-16
2004 303(d) Listed Waterbodies in the Tucannon River Implementation Area



3.5.5 Aquatic Habitat

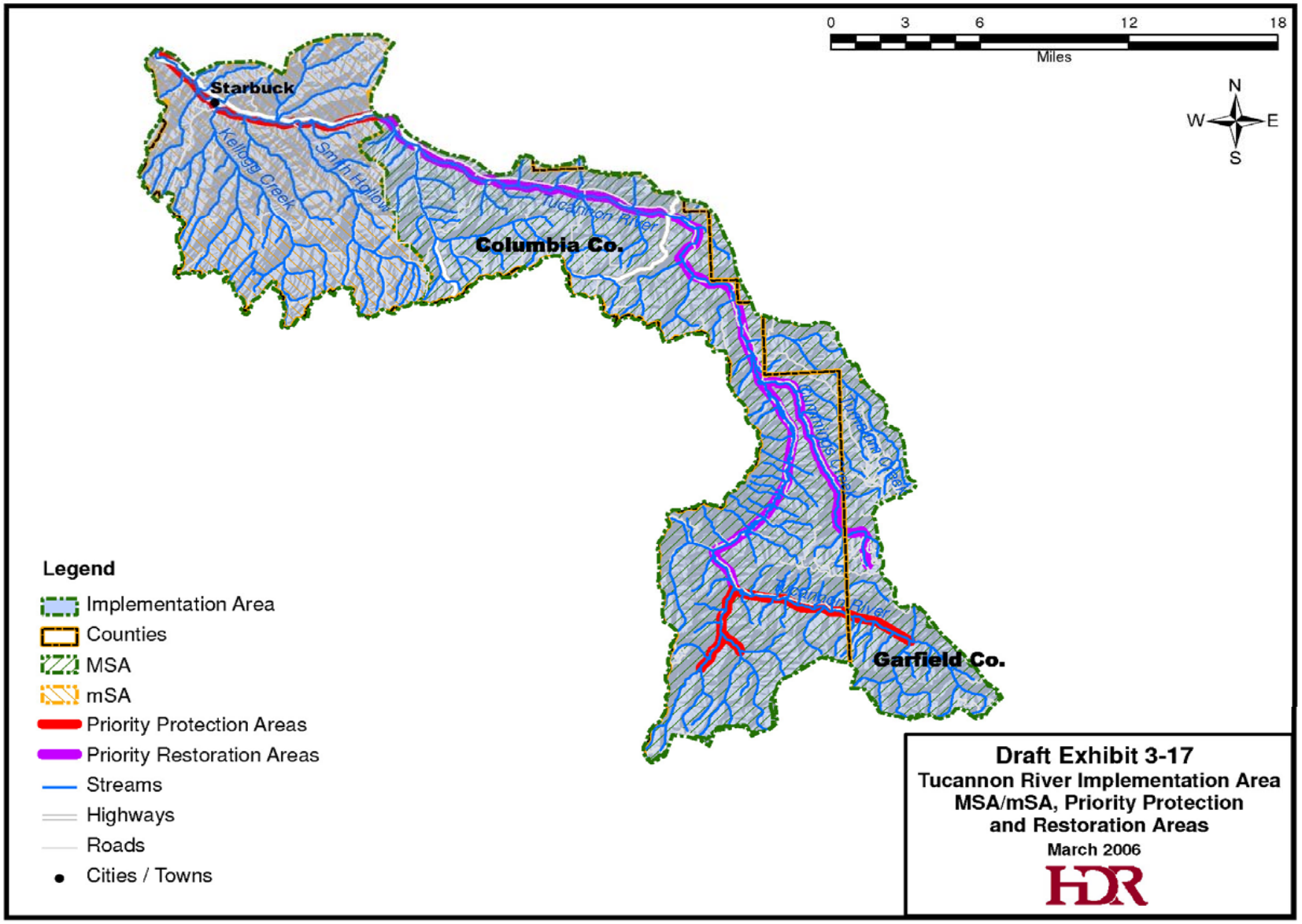
The SRSRP and LFA have identified the following fish species as focal species within the Tucannon River Implementation Area.

Snake River steelhead	*Oncorhynchus mykiss*
Spring and Summer Chinook	*Oncorhynchus tshawytcha*
Bull trout	*Salvelinus confluentus*

The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area below. Limiting factors for fish were determined using EDT. The EDT process and specific details regarding the analysis may be found in the SRSRP. More information is also available in the LFA.

Exhibit 3-17 shows MSA/mSA's, imminent threats, and priority protection/restoration areas as described in the SRSRP (2006).

The major factors limiting the viability of the Tucannon River steelhead and spring/summer Chinook populations are high sediment loads, lack of large woody debris, anthropogenic (human caused) confinement, and reduced riparian function, and their impacts on habitat diversity, channel stability; key habitats (pools and pool tail-outs), summer water temperature, and flow.


0 3 6 12 18
Miles
N
W E
S
Starbuck
Kellogg Creek
Smith Hollow
Tucannon River
Columbia Co.
Tumalum Creek
Pataha Creek
Garfield Co.
Legend
Implementation Area
Counties
MSA
mSA
Priority Protection Areas
Priority Restoration Areas
Streams
Highways
Roads
Cities / Towns
Draft Exhibit 3-17
Tucannon River Implementation Area
MSA/mSA, Priority Protection
and Restoration Areas
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HDR

Lower Tucannon River Mainstem (mouth to Pataha)

The EDT analysis showed that the largest proportion of the impact to spring/summer Chinook populations is attributed to temperature, a lack of key habitat quantity, and sedimentation, as well as lack of habitat diversity. Channel stability, flow, food, pathogens, and predation account for the smallest proportions.

Causes of Impacts to the Lower Tucannon Mainstem and Pataha Creek: Much of the sedimentation problem in the lower Tucannon mainstem is attributable to agricultural practices along the lower Tucannon mainstem and in the Pataha Creek valley. This situation is exacerbated by a poorly designed road system in the Pataha watershed. Temperature problems are attributable to riparian damage upstream (reduced shading), low flows caused by hydrological disruption of the upper watershed, and upstream irrigation diversions. The lack of pools and pool tail-outs is caused by very low quantities of large woody debris and the filling of pools with transported sediment.

In 1992, WDFW built a new fish ladder at Starbuck Dam. The ladder is opened only from October through December to allow fall Chinook to pass. A notch cut in the center of the structure allows water to cascade through during the spring and summer. The intent of the notch and ladder is to allow upstream passage of adult salmon and steelhead in the spring and summer, but to block the passage of nongame fish. Adult salmon, steelhead, and bull trout are believed to be able to pass the dam, but there is concern that juvenile or subadult bull trout may not be able to pass.

Tucannon River Mainstem (Pataha to Marengo)

Key habitat quantity has been identified as the primary factor limiting steelhead production. Habitat diversity, flow, channel stability, sediment, and temperature were identified as secondary limiting factors. Primary limiting factors for spring/summer Chinook are temperature, key habitat quantity, and habitat diversity; secondary factors are flow, channel stability, sediment, and food availability.

Causes of Impacts to Tucannon Mainstem, Pataha Creek to Marengo: Most of the habitat problems in the Tucannon mainstem above the Pataha confluence are attributable to relatively recent floods and human response to the flood damage such as, the replacement of natural riparian areas with irrigated cropland and the installation of flood levees. The combination of these responses and a natural hydrological regime with frequent rain-on-snow events has caused the Tucannon River to become geomorphically unstable.

Tucannon River Mainstem (Marengo to Little Tucannon River)

Habitat diversity and key habitat quantity are considered to be the primary limiting factors for summer steelhead. Flow and channel stability are secondary limiting factors. The poor habitat diversity in these areas is the result of poor riparian condition and a lack of large woody debris. Much of the key habitat impact is attributed to a lack of pools, which, in turn, are the result of channel straightening and the scarcity of large woody debris. Several minor limiting factors for steelhead include competition with hatchery fish, pathogens, stream temperature, and harassment/poaching.

The dominant limiting factors identified by EDT for spring/summer Chinook in this portion of the Tucannon River are a lack of habitat diversity and key habitat (pools). Secondary limiting factors include temperature (the impact of which decreases substantially in the upstream reaches) and minor impacts attributable to channel stability, flow, and food.

Causes of Impacts to Tucannon River from Marengo to Little Tucannon: Anthropogenic degradations to habitat conditions in this area are similar to those occurring in the Tucannon mainstem from Pataha Creek to Marengo. In addition, recreational use has affected salmonid habitat in a number of ways in this area. Forest lands in this area receive a high level of recreational use; particularly in the National Forest's Wenaha Wilderness area and on WDFW lands. Because the uplands are dominated by steep slopes, most recreational use is concentrated in riparian areas. Nearly 400,000 visitors per year use the area for camping, fishing, hunting, wildlife viewing, and hiking in the wilderness area.

Tucannon River Mainstem (Little Tucannon to Bear Creek)

A lack of key habitat (primarily pools) is the dominant limiting factor for steelhead and spring/summer Chinook in the headwaters of the Tucannon River, with minor impacts attributable to channel stability and habitat diversity. The impacts of all limiting factors in this area, as well as the Panjab Creek drainage were minimal. For both steelhead and spring/summer Chinook, the dominant limiting factor was a lack of key habitat attributable to a decrease from historical levels in the quantity of pools. Inadequate habitat diversity and channel instability also had minor impacts, as did a minimal increase in peak flows.

Causes of Impacts to Tucannon Headwaters: Habitat degradation in the Tucannon headwaters is primarily attributed to inadequate quantities of large woody debris which, in turn, are the result of past logging operations. Stream and riparian damage occurred because logs were often moved downhill in stream channels and floodplains. Large scale commercial harvest began in the early 1950s. The U.S. Forest Service reports that approximately 75,000 acres have been cut.

3.6 Grande Ronde Implementation Area

The Grande Ronde Implementation Area is the Washington portion of the Grande Ronde IA, which is located in both northeastern Oregon and southeastern Washington. The area is bounded by the Washington – Oregon border to the south and WRIA 32 to the west, and drains approximately 340 square miles of southeast Washington. The primary drainages within Washington include Crooked, Wenatchee, Cougar, Cottonwood, and Joseph creeks, as well as the Grande Ronde mainstem, which enters the Snake River at RM 169. Major jurisdictions within the area include Asotin County, Columbia County, Garfield County, and the USFS. Land use in the area is largely centered on agricultural (irrigated and non-irrigated crops, and grazing), and timber harvesting within forested areas. The Grande Ronde IA is rural with no established urban areas; population in the year 2005 is approximately 558 and is expected to drop slightly to 515 by the year 2025.

3.6.1 Historical, Current and Ongoing Watershed Activities

In 1992, the Northwest Power Planning Council selected the Grande Ronde river basin to be the site of Oregon's model watershed project. The Grande Ronde Model Watershed program (www.grmw.org) covers 5,265 square miles, primarily in Oregon, with a small portion in southeast Washington. While the majority of watershed restoration and recovery efforts for the basin have been implemented in Oregon, a few project, noted below, have taken place in the Washington portion of the watershed. While not exhaustive, Table 3-24 demonstrates watershed activities in the Washington portion of the Grande Ronde Subbasin. Exhibit 3-18 illustrates the approximate geographic distribution of existing Grande Ronde Model Watershed projects within Washington, as well as depicting the general types of projects completed

Table 3-24
Grande Ronde Watershed Planning and Implementation Activities, 1990s-Present

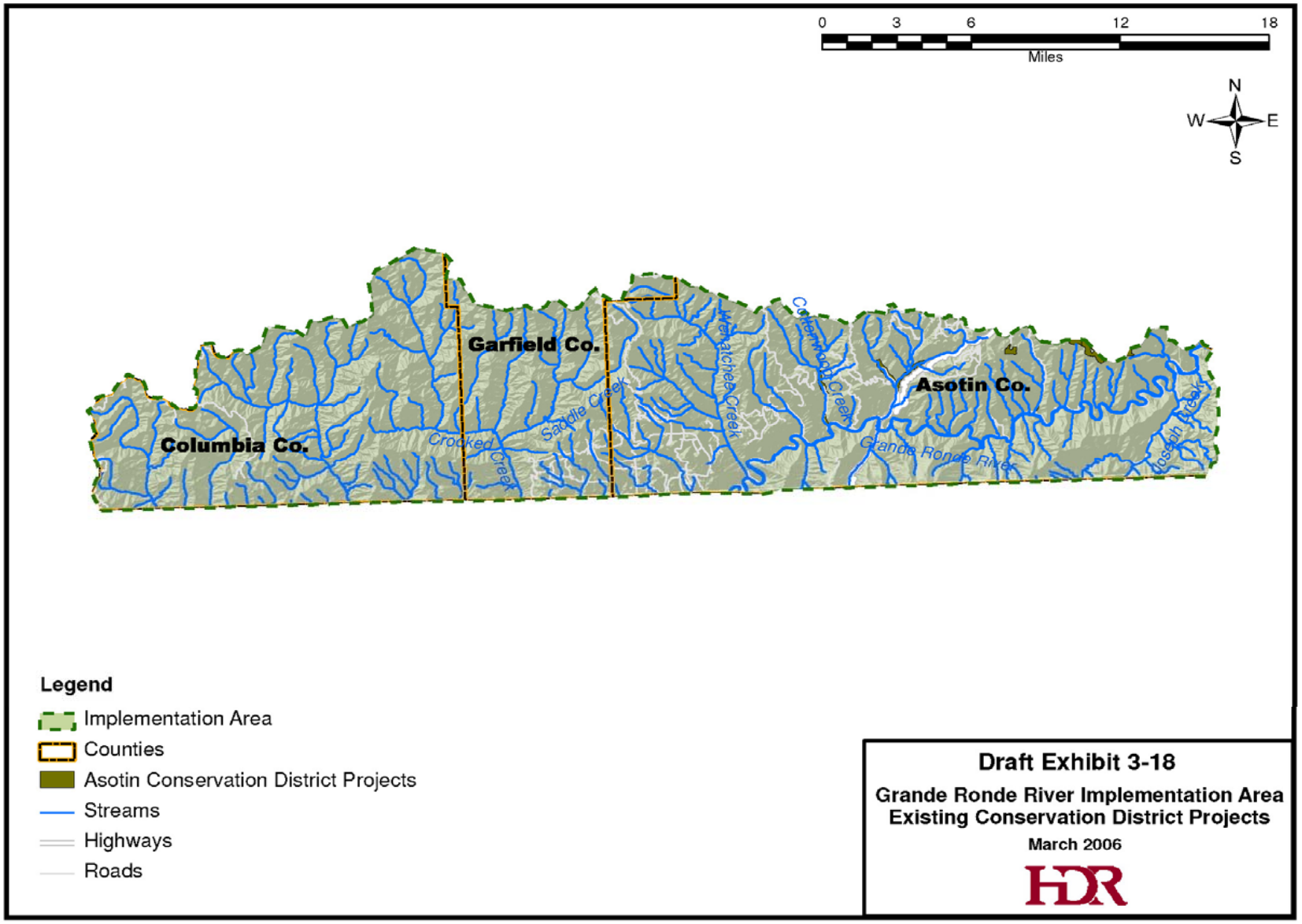
Date	Activity and/or Accomplishment
1997	Restored, reconstructed and relocated trails on the Crooked Creek Trail and Smooth Ridge, in response to flood damage and trail deterioration
1998	Riparian exclosure fence constructed
1998	Riparian exclosure fence constructed
2000	Trail reconstruction/relocation, slopes and streambanks stabilized (Trails: Wenaha River, Wenatchee / Menatchee, Indian Tom, Hoodoo, Cross Canyon, Cat Track)
2001	Trail reconstruction/relocation, slopes and streambanks stabilized (Trails: Wenaha River, Wenatchee / Menatchee, Wehana Beaver)
2001	Cross fence constructed on Grouse Creek tributary and Sheep Creek
2002	Planted cropland to perennial grass
2003	Planted grazed land to pasture/hayland grasses
2003	Riparian exclosure fence and planting
2003	Riparian exclusion fence and planting; livestock water developments
Source:	
Grande Ronde Basin Watershed Restoration Project Inventory, 6/29/05	

3.6.2 Water Quantity

There are no urban areas in the IA. As a result, the primary water use categories include small public water systems, individual household wells, and agricultural water users. Irrigated agriculture accounts for the largest portion of water use in the area.

Surface and Groundwater Rights

Tables 3-25 and 3-26 provide summaries of the types of use and related quantities for surface and groundwater permitted and certified water rights respectively. Water rights that have irrigation as one of the purposes of use account for 93 percent of all allocated water rights in the area. Approximately 92 percent of the water rights are associated with surface water use.


0 3 6 12 18
Miles
N
W E
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Garfield Co.
Asotin Co.
Columbia Co.
Crocked Creek
Saddle Creek
Wenatchee Creek
Cottonwood Creek
Grande Ronde River
Joseph Creek
Legend
Implementation Area
Counties
Asotin Conservation District Projects
Streams
Highways
Roads
Draft Exhibit 3-18
Grande Ronde River Implementation Area
Existing Conservation District Projects
March 2006
HDR

Table 3-25
Summary of Surface Water Rights[1] for Grande Ronde IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (cfs)
Irrigation / Stock Watering	12	1948	9
Stock Watering / Wildlife Propagation	11	13	0
Domestic Single* / Stock Watering / Irrigation	2	39	0
Fish Propagation	1	0	6
Domestic Single / Highway**	1	2	0

Notes:

1. The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights.
2. Not all rights have a specified cfs associated with them; only those that do are shown here.
   - *Domestic Single (one dwelling with lawn and garden, up to one-half acre)

** Highway (maintenance and construction)

Table 3-26
Summary of Groundwater Rights[1] for the Grande Ronde IA

Purpose of Use	Number of Records	Annual Quantity, Qa (afy)	Instantaneous Quantity, Qi (gpm)
Domestic Single*	1	1	20
Domestic Single / Stock Watering	1	2	10
Domestic Multiple**	5	134	400
Domestic Multiple / Irrigation	1	24	30

Notes:

1. The detailed summary by Purpose of Use only includes data pertaining only to water right permits and certificates, as listed in the Department of Ecology Water Rights Application Tracking System (WRATS) database (February 4, 2004). Quantities of water associated with claims and water right applications are not included in this table. There is no feasible means of evaluating the validity, or documenting the amount of, water associated with claims. There are no annual or instantaneous quantities associated with water right applications, because they are not appropriated rights.
   - **Domestic Multiple (more than one dwelling none of which are under municipal control)
   - *Domestic Single (one dwelling with lawn and garden, up to one-half acre)

Future Water Demand

Future demand for municipal and residential use was calculated using population forecasts, land use, and per capita demand and is presented in Table 3-27.

Table 3-27
Annual Demand Projections for Grande Ronde IA

Year	Asotin Co.	Columbia Co.	Garfield Co.	Grande Ronde IA Total
2000	54	68	39	160
2005	47	68	39	154
2010	54	68	39	160
2015	51	68	39	157
2020	46	68	39	153
2025	33	68	39	139

Estimated data taken from Ecology suggests the total irrigated acreage in this area is approximately 4,895 acres. This estimate is not consistent with Asotin Conservation District, which estimates only 350 to 500 acres are currently under irrigation. Surface water diversions in this area are primarily taken from the Grande Ronde mainstem and Joseph Creek. Irrigable acreage is limited in the area and agricultural growth is expected to remain constant over time.

3.6.3 Instream Flow

Development of minimum instream flows, flow enhancement targets and closures and restrictions at management points are under development with the Planning Unit. Results will be included in the final of this document.

The Level 1 WRIA 35 Assessment included information regarding instream flow gauges. Table 3-28 includes an updated list of gauge locations that have produced data that was used in development of minimum instream flow recommendations.

Proposed SWSLs for the IA include closures and restrictions at the management points, as well as minimum instream flows and flow enhancement targets will be included in Exhibit 3-19 of the final watershed plan.

3.6.4 Water Quality

Most available water quality data in the Grande Ronde IA is focused on the Grande Ronde River mainstem. Specific water quality data from Ecology is not generally available for tributary streams other than temperature data from the mouth of Wenatchee Creek, which has been found to exceed state water quality standards. According to available data, the primary concerns for the Grande Ronde mainstem are elevated summer temperatures and suspended sediment.

Table 3-28

WRIA 35 Gauge ID Matrix for Grande Ronde River Implementation Area

Gauge No.	Subbasin	Agency	Gauge ID	Location	Data Type	Period of Record
9	Grande Ronde	USGS	13334000	Grande Ronde River at Zindel, WA	Daily Streamflow	1909-1911
10	*Grande Ronde (Oregon)*	*USGS*	*13333300*	*Grande Ronde River at Troy, WA (not on map)*	*Daily Streamflow*	*1944-2001*
11	Grande Ronde	Ecology	35G060	Joseph Creek Near Mouth	Telemetry	June 03-Present

Exhibit 3-19 Grande Ronde Proposed Water Use Restrictions

THIS EXHIBIT UNDER DEVELOPMENT

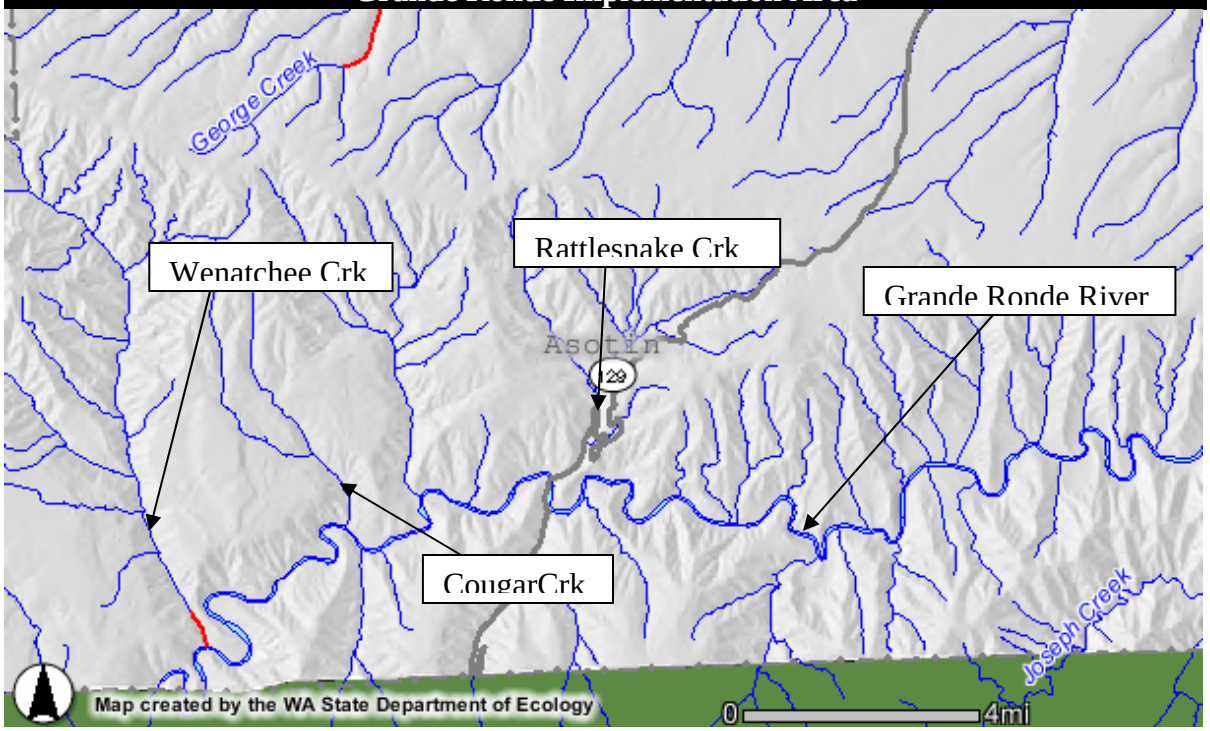
Table 3-29 shows the most recent 303(d) list of impaired water bodies released by Ecology. All waterbodies on the 303(d) list are classified as Category 5, meaning that Washington's state water quality standards have been exceeded, and there is no existing TMDL or pollution control plan. TMDLs are required for the water bodies in this category, although no TMDLs have been scheduled for this IA at this date.

Table 3-29
2004 TMDL and 303(d) Listing Status in the Grande Ronde Implementation Area

Listing ID	WRIA	Water Body	Parameter	Category	TMDL Status
22431	35	Wenatchee Creek	Temperature	5	None

Wenatchee Creek is the only waterbody included on the 303(d) list. The locations of the water quality impairments in this IA are illustrated in Exhibit 3-20.

Exhibit 3-20
2004 303(d) Listed Waterbodies in the Grande Ronde Implementation Area



3.6.5 Aquatic Habitat

The SRSRP and LFA have identified the following fish species as focal species within the Pataha Creek Implementation Area.

Snake River steelhead	*Oncorhynchus mykiss*
Spring and Summer Chinook	*Oncorhynchus tshawytcha*
Bull trout	*Salvelinus confluentus*

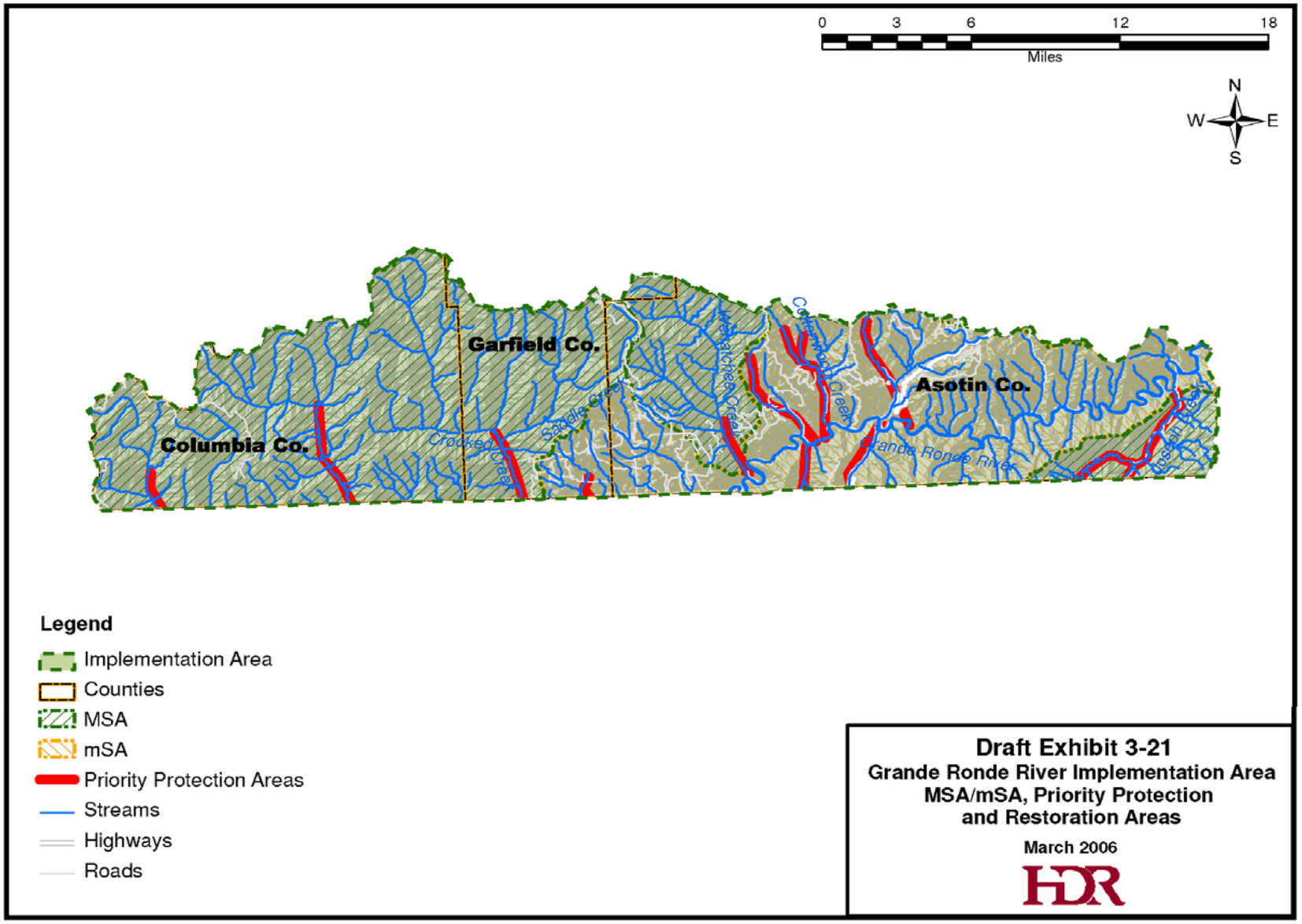
The limiting factors for these fish species were addressed in detail in the SRSRP and are generally summarized by drainage area below. Limiting factors for fish were determined using EDT. The EDT process and specific details regarding the analysis may be found in the SRSRP. More information is also available in the LFA.

Exhibit 3-21 shows MSA/mSA's, imminent threats, and priority protection/restoration areas as described in the SRSRP (2006).

Lower Grande Ronde Mainstem and Tributaries (RM 38 to mouth)

In this area, the largest impacts are due to sedimentation and key habitat quantity (pools), with moderate impacts due to excessive stream temperatures. Lesser impacts were attributed to habitat diversity, low flow, and fish pathogens. Specifically within the lower Grande Ronde River mainstem, the largest impacts affecting salmonids are attributable to a lack of habitat diversity and key habitat (pools), while sedimentation and temperature were the major impacts identified in most lower Grande Ronde tributaries. Sedimentation is the dominant limiting factor in the Lower Joseph Creek, with pathogens, predation, temperature, and a lack of key habitat (pools) as secondary impacts.

Causes of impacts to the Lower Grande Ronde: There is a lack of habitat diversity in the lower Grande Ronde mainstem primarily related to stream channelization, sedimentation from upstream sources, and a lack of large woody debris. Most of the sediment and temperature problems in Grande Ronde River tributaries are attributed to riparian degradation associated with roads situated next to streams, as well as riparian grazing. Sediment and other impacts affecting lower Joseph Creek are likely caused by upstream activities (in Oregon), and that actions taken strictly within Washington are unlikely to improve conditions.


0 3 6 12 18
Miles
N
W E
S
Garfield Co.
Asotin Co.
Columbia Co.
Cottonwood Creek
Wenaha Creek
Saddle Creek
Crooked Creek
Grande Ronde River
Joseph Creek
Legend
Implementation Area
Counties
MSA
mSA
Priority Protection Areas
Streams
Highways
Roads
Draft Exhibit 3-21
Grande Ronde River Implementation Area
MSA/mSA, Priority Protection
and Restoration Areas
March 2006
HDR

Section 4
General Strategies and Tools

Key planning issues for WRIA 35 have been identified in Sections 5 and 6 in the areas of water supply, instream flow, water quality, and aquatic habitat. General strategies or "tool sets" that can be used to address the key planning issues are discussed below, and specific tools (e.g. programs, projects, BMPs, regulations, etc) are described in detail in Appendix B. The strategies and tools include measures that can be implemented by the Planning Unit, federal, state, and local agencies, tribes, conservation districts, individual landowners, and other stakeholders and water users in addressing key planning issues. The inclusion of a specific strategy or tool herein is not intended as a recommendation for its use within WRIA 35, rather, it is provided here as a menu of some of the possible actions or strategies that are available to address key planning issues within the watershed. This listing of possible tools, while extensive, is by no means exhaustive, and the Planning Unit and other stakeholders may identify and select other means to address the key planning issues discussed within this Plan.

A listing of the tools is provided in Appendix B, presented in eight broad categories:

- Water conservation
- Water storage
- Water quality
- Groundwater management
- Groundwater quality
- Regulatory / administrative
- Habitat Enhancement
- Monitoring

Tools within each of these categories may apply to one or more of the key planning issues; many tools can affect multiple planning issues. The Appendix is composed of five tables identifying the specific tools within each category. Each table provides a description of the tool, the potential benefits normally expected with implementation of the tool, approximate cost range (e.g. low, medium, high), parties responsible for implementation, and other issues (e.g., social, legal, technical) that could be a factor when considering undertaking any of the listed strategies.

This section (and Appendix B) is designed to be used as a general reference for the Planning Unit and other stakeholders and individuals involved in watershed planning activities. The lists are not intended to be exhaustive, but rather to provide a range of options available when considering activities in each Implementation Area. As such, these strategies and tools are not specific to any of the Implementation Areas per se; the discussion of recommended strategies per Implementation Area is provided in Section 6.

4.1 Strategies & Tools for Water Supply Issues

Water supply issues arise when there is increased competition for water and a limited supply of the resource. Competition for water is increasing throughout Washington State as population and economic growth occurs and as regions prepare for anticipated future growth. Multiple demands include needs for municipal water, agricultural uses (e.g., irrigation and stock watering), recreation, and commercial/industrial use, as well as federal and state requirements for salmon protection and recovery and instream flows. Water supply tools are primarily intended to address the demand for water for human-related uses, such as municipal and irrigation use, but may also benefit instream flow. Tools identified under Instream Flow Strategies and Aquatic Habitat Strategies are primarily designed to benefit fish and natural habitats.

When addressing water quantity issues in a WRIA planning process, a number of strategies must be considered, including water conservation, water reuse, water reclamation and reuse, voluntary water transfers, aquifer recharge, additional water allocations, or additional water storage enhancements (Chapter 90.82 RCW).

An index to the strategies and tools that can be used to address water supply issues is provided in Table 4-1. These strategies and tools are described in detail with information on benefits, costs, implementing party, and related social and technical issues in Appendix B.

Table 4-1
Tools to Address Water Supply Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
■ Municipal-Consumer Demand Management Program for Residential, Business and Public Properties ■ Municipal-Operational Efficiency Management Program for Water Systems ■ Regional agricultural water conservation and irrigation efficiency strategies ■ On-farm agricultural water conservation and irrigation efficiency strategies ■ Industrial Conservation Measures ■ Water reuse facilities by wastewater facilities ■ On-site greywater segregation and use	■ Construct and operate new on-channel storage facilities ■ Raise and operate existing on-channel storage facilities ■ Construct and operate new off-channel storage facilities ■ Raise and operate existing off-channel storage facilities ■ Use existing storage facilities for additional beneficial uses ■ Construct and operate artificial recharge / aquifer storage projects ■ New riparian storage or farm field flood storage ■ New or modified riparian wetlands ■ Modification of existing sediment basins ■ Alternative source for irrigation ■ Direct stream augmentation ■ New water supply	■ Transfer existing water rights for out-of-stream uses to other out-of-stream beneficial uses ■ Transfer water through interties of public water systems or irrigation systems ■ Short-term or long-term allocation ■ Adjudication of water rights ■ Assignment of watermaster ■ Increase enforcement against illegal water use within a basin or subbasin ■ Evaluate existing water rights within a basin or subbasin (without an adjudication) ■ Adopt rules and/or regulations regarding wells ■ Extend public water systems services into areas served by exempt wells	■ Encourage landowner participation in the Conservation Reserve Enhancement Program (CREP) ■ Pipe open ditch conveyance systems	■ Analyze baseline water conditions in the watershed ■ Monitor current water permitting system for the watershed ■ Monitor stored water levels ■ Monitor groundwater use ■ Monitor water meters ■ Monitor existing water rights ■ Analyze outstanding water rights applications on file with state water agency ■ Monitor conservation programs ■ Monitor irrigation efficiency projects

4.2 Strategies and Tools for Instream Flow Issues

The term "*instream flow*" is used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flow needed to protect and preserve instream resources and values, such as fish, wildlife and recreation.

An index to the strategies and tools that can be used to address instream flow issues is provided in Table 4-2. These strategies and tools are described in detail with information on benefits, costs, implementing party, and related social and technical issues in Appendix B.

Table 4-2
Tools to Address Instream Flow Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
■ Municipal – Consumer Demand Management Program for Residential, Business and Public Properties ■ Regional agricultural water conservation and irrigation efficiency strategies ■ On-farm agricultural water conservation and irrigation efficiency strategies ■ Industrial conservation measures ■ Water reuse facilities by wastewater utilities ■ On-site greywater segregation and use	■ Construct and operate new off-channel storage facilities ■ Raise and operate existing off-channel storage facilities ■ Use existing storage facilities for additional beneficial uses ■ Construct and operate artificial recharge / aquifer storage projects ■ New riparian storage or farm field flooding storage ■ Alternative source for irrigation ■ Direct stream augmentation ■ New water supply	■ Transfer existing water rights for out-of-stream uses to instream beneficial uses through Trust Water Right Program ■ Short-term or long-term allocation ■ Complete or partial closure of a basin or subbasin from appropriations ■ Assignment of a watermaster ■ Increase enforcement against illegal water use within a basin or subbasin ■ Evaluate existing water rights within a basin or subbasin (without an adjudication) ■ Evaluate tribal water rights claims within a basin or subbasin ■ Extend public water system services into areas served by exempt wells	■ Encourage landowner participation in Conservation Reserve Enhancement Program (CREP) ■ Encourage landowner participation in the Environmental Quality Incentives Program (EQIP) ■ Encourage landowner participation in the Wetlands Reserve Program (WRP)	■ Analyze baseline water conditions in the watershed ■ Monitor current water permitting system for the watershed ■ Monitor stored water levels ■ Monitor groundwater use ■ Monitor water meters ■ Monitor existing water rights ■ Analyze outstanding water rights applications on file with state water right agency ■ Monitor conservation programs ■ Monitor irrigation efficiency projects

4.3 Strategies and Tools for Surface Water Quality Issues

The state's surface water quality standards set limits on pollution in lakes, rivers and marine waters in order to protect water quality. Standards are designed to prevent pollution from chemicals, bacteria, toxics and other sources, as well as protect fish species that are sensitive to factors such as water temperature. The federal Clean Water Act (CWA) requires that the water quality standards protect beneficial uses, such as swimming, fishing, aquatic life habitat, and agricultural and drinking water supplies.

Pollution in a watershed can come from point and nonpoint sources. Point sources, such as direct discharges from wastewater treatment plants, irrigation return ditches, or industrial discharges, are regulated by discharge permits specific to the individual discharge. The discharge permits, regulated under the National Pollutant Discharge Elimination System (NPDES), set limits on the pollutant concentrations allowed in the discharge. Water quality issues attributable to direct discharges are generally addressed by the regulatory agency and the permit holder.

Nonpoint sources of pollution include run-off from land activities such as logging, urbanization, and agriculture. Nonpoint sources of pollution are difficult to identify and control since they are generated by a wide variety of sources, mostly individual actions. There are a variety of federal, state and local tools to assist in implementing projects that will improve nonpoint sources of pollution in a watershed, from changing agricultural, logging, and landscaping practices to collecting and treating runoff.

An index to the strategies and tools that can be used to address water quality issues is provided in Table 4-3. These strategies and tools are described in detail with information on benefits, costs, implementing party, and related social and technical issues in Appendix B.

Table 4-3
Tools to Address Water Quality Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
■ Municipal-Consumer Demand Management Program for Residential, Business and Public Properties ■ Regional agricultural water conservation and irrigation efficiency strategies ■ On-farm agricultural water conservation and irrigation efficiency strategies ■ Industrial conservation measures ■ Water reuse facilities by wastewater utilities	■ Construct and operate new off-channel storage facilities ■ Construct and operate artificial recharge / aquifer storage projects ■ New riparian storage or farm field flooding storage ■ New or modified riparian wetlands ■ Modification of existing sediment basins ■ Direct stream augmentation ■ New water supply	■ Transfer existing water rights for out-of-stream uses to instream beneficial uses through the Trust Water Right Program ■ Short-term or long-term allocation ■ Complete or partial closure of a basin or subbasin from appropriations ■ Evaluate existing water rights within a basin or subbasin (without an adjudication) ■ Evaluate tribal water rights claims within a basin or subbasin ■ Extend public water system services into areas served by exempt wells ■ Implement a pollution trading (credit) system for water to facilitate compliance with a Total Maximum Daily Load (TMDL) ■ Incorporate requirements for improving the quality of discharges from existing industries when issued State Waste	■ Encourage landowner participation in the Conservation Reserve Enhancement Program (CREP) ■ Encourage landowner participation in the Environmental Quality Incentives Program (EQIP) ■ Encourage landowner participation in the Wetlands Reserve Program (WRP) ■ Implement habitat improvement projects involving construction or placement of instream structures ■ Implement habitat improvement projects involving out-of-stream riparian restoration or enhancement ■ Restore natural floodplain function in channelized stream reaches ■ Move river dikes back from existing river channels to allow for floodplain restoration and channel maintenance ■ Plant native vegetation ■ Fence riparian areas ■ Manage grazing in riparian areas ■ Relocate campgrounds further from stream edges where assessments show potential for erosion and other adverse effects ■ Develop regulations or programs	■ Monitor livestock use of riparian areas ■ Monitor efficacy of habitat improvement projects ■ Conduct water quality monitoring ■ Evaluate TMDL implementation ■ Monitor conservation programs ■ Monitor irrigation efficiency projects

Table 4-3
Tools to Address Water Quality Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
		Discharge Permits or National Pollutant Discharge Elimination System Permits (NPDES) ■ Increase the level of inspection of commercial dairy operations and enforcement of water quality as appropriate	to control sources of sediment that are not addressed through critical areas ordinances or other regulations ■ Re-establish historic wet meadow complexes	

4.4 Strategies and Tools for Groundwater Management Issues

Management of groundwater as a resource is an important component of a watershed planning effort because it is heavily used as a source of water supply and can also affect stream flow where surface water is hydraulically connected to groundwater.

Groundwater management can have a significant effect on management of stream flows. Where groundwater is hydraulically connected with surface water, pumping of wells can reduce baseflows in nearby streams by reducing the water table gradient in the shallow aquifer. This is due to capture of groundwater that otherwise would have discharged to surface water. These types of effects are complex and vary according to many factors including the nature of the local hydrogeology and topography.

Most of the existing programs utilized for groundwater management are based on State and federal legislation designed to provide water quantity and/or quality protection. Regulatory programs such as Sole Source Aquifer Program (SSA), Aquifer Protection Areas (APA), and Growth Management Act Critical Areas, focus primarily on water quality issues and management.

An index to the strategies and tools that can be used to address water quality issues is provided in Table 4-4. These strategies and tools are described in detail with information on benefits, costs, implementing party, and related social and technical issues in Appendix B.

Table 4-4

Tools to Address Groundwater Management Issues

Groundwater Management Tools	Monitoring Tools
■ Develop a Groundwater Management Program (GWMP) ■ Implement water demand reduction strategies ■ Implement recharge enhancement with SAR (shallow aquifer recharge) projects ■ Implement recharge enhancement with ASR (aquifer storage and recovery) projects ■ Implement water rights transfers ■ Pursue regional coordination ■ Conduct a hydrogeologic study	■ Identify land use activities and contaminants to be addressed with technical management strategies ■ Conduct groundwater monitoring program, including development of groundwater model

4.5 Strategies & Tools for Groundwater Quality Issues

A number of federal environmental laws are directly or indirectly designed to protect groundwater from contamination. Examples of these laws include the Safe Drinking Water Act (SDWA); Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and Toxic Substances Control Act (TSCA). In most cases, state agencies are responsible for promulgating regulations in the state of Washington in accordance with these federal laws. Examples of state agencies with regulatory authority to protect groundwater quality under the aforementioned federal laws include the Washington State Department of Health (DOH), Ecology, and Washington State Department of Agriculture (WSDA).

Ecology has several programs related to groundwater quality protection. Examples include the Aquifer Vulnerability Project under the Water Quality Program and the Underground Injection Control Program (UIC). The purpose of the Aquifer Vulnerability Project is to develop a method for identifying areas of the state that are vulnerable to groundwater contamination and assess areas of the state that are relatively more vulnerable to groundwater contamination from pesticides to support the proposed State Pesticide Management Plan. The UIC program protects groundwater quality by regulating the disposal of fluids into the subsurface. Most UIC wells or injection wells are simple devices that allow fluids into the shallow subsurface under the force of gravity.

The potential for groundwater contamination from UIC wells can occur and is dependent on the well construction and location, the volume and quality of the fluids injected and the hydrogeologic setting.

WSDA is currently developing a statewide pesticide management plan to address the potential for pesticide occurrences in groundwater. Development of this plan is being driven by several state and federal initiatives designed to protect groundwater quality from the unintended movement of pesticides resulting from labeled agricultural and urban use.

Existing statewide regulations have limitations, which occasionally fail to protect groundwater from contamination. Local government agencies often need to develop and implement a groundwater management program to address the limitations of the regulations.

An index to the strategies and tools that can be used to address water quality issues is provided in Table 4-5. These strategies and tools are described in detail with information on benefits, costs, implementing party, and related social and technical issues in Appendix B.

Table 4-5

Tools to Address Groundwater Quality Issues

Groundwater Quality Tools	Monitoring Tools
■ Conduct Level 1 risk assessment ■ Identify land use activities and contaminants to be addressed with technical management strategies ■ Enforce Wellhead Protection Program requirements for all Group A Public Water Systems (PWS) ■ Encourage Group B Public Water Systems to voluntarily establish a wellhead protection program ■ Select and implement technical management strategies based on assessment findings ■ Evaluate the need for greater involvement of stakeholders in cleanup actions at Ecology-regulated facilities and sites ■ Evaluate the need for independent cleanup actions ■ Provide oversight for well decommissions to ensure decommissions consistent with safe practices ■ Assess drinking water supplies that are unprotected and "at risk" of becoming impacted in the future ■ Develop and implement management protocols of unprotected groundwater sources located outside the service areas of large and medium water purveyors	■ Monitor groundwater quality ■ Monitor well levels, yield, drawdown and capacity ■ Conduct periodic susceptibility analysis ■ Monitor potential contaminant sources

4.6 Strategies and Tools for Aquatic Habitat Issues

If initiating governments choose to include a habitat component in their watershed plan, the plan must be coordinated or developed in a manner that serves to protect or enhance fish habitat in the WRIA. Planning activities under Chapter 90.82 RCW must also be integrated with strategies developed as part of other processes undertaken in response to potential or actual listing of salmon and other fish species as being threatened or endangered under the federal Endangered Species Act. In WRIAs where habitat restoration activities are being developed and implemented under the Salmon Recovery Act (Chapter 77.85 RCW), such activities must be relied upon as the primary nonregulatory habitat component for fish habitat in the watershed plan.

An index to the strategies and tools that can be used to address aquatic habitat issues is provided in Table 4-6. These strategies and tools are described in detail in Appendix B.

Table 4-6

Tools to Address Aquatic Habitat Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
■ Municipal – Consumer Demand Management Program for Residential, Business and Public Properties ■ Regional agricultural water conservation and irrigation efficiency strategies ■ On-farm agricultural water conservation and irrigation efficiency strategies ■ Industrial conservation measures ■ Water reuse facilities by wastewater utilities	■ Construct and operate new off-channel storage facilities ■ Raise and operate existing off-channel storage facilities ■ Construct and operate artificial recharge / aquifer storage projects ■ New riparian storage or farm field flooding storage ■ New or modified riparian wetlands ■ Modification of existing sediment basins ■ Alternative source for irrigation ■ Direct stream augmentation ■ New water supply	■ Transfer existing water rights for out-of-stream uses to instream beneficial uses through the Trust Water Right Program ■ Short-term or long-term allocation ■ Complete or partial closure of a basin or subbasin from appropriations ■ Increase enforcement against illegal water use within a basin or subbasin ■ Evaluate tribal water rights claims within a basin or subbasin ■ Adopt rules and/or regulations regarding wells ■ Extend public water system services into areas served by exempt wells ■ Implement a pollution trading (credit) system for water to facilitate compliance with a Total Maximum Daily Load (TMDL) ■ Incorporate requirements for improving the quality of discharges from existing industries when issuing state Waste Discharge Permits or National Pollutant Discharge Elimination System Permits (NPDES) ■ Increase the level of inspection of commercial dairy operations and enforcement of water quality	■ Encourage landowner participation in the Conservation Reserve Enhancement Program (CREP) ■ Encourage landowner participation in the Environmental Quality Incentives Program (EQIP) ■ Encourage landowner participation in the Wetlands Reserve Program (WRP) ■ Implement habitat improvement projects involvement construction and placement of instream structures ■ Construct pool and riffle habitat using instream modifications ■ Implement habitat improvement projects involving out-of-stream riparian restoration or enhancement ■ Implement habitat improvement projects intended to 'daylight' streams currently contained within enclosed channels ■ Restore natural floodplain function in channelized stream reaches ■ Move river dikes back from existing river channels to allow for floodplain restoration and channel maintenance ■ Plant native vegetation ■ Fence riparian areas ■ Manage grazing in riparian areas ■ Remove or replace bridges, culverts, roadways and other infrastructure	■ Monitor the status of focal species ■ Study the behavior of focal species ■ Monitor core populations ■ Conduct creel surveys ■ Evaluate fish passage limitations ■ Monitor progress of restoring recreational and tribal fisheries ■ Monitor and compare life histories of hatchery and wild fish ■ Monitor impact of non-native fish species on native fish species ■ Monitor riparian habitat condition ■ Monitor livestock use of riparian areas ■ Monitor efficacy of habitat improvement projects ■ Conduct water quality monitoring ■ Evaluate TMDL

Table 4-6

Tools to Address Aquatic Habitat Issues

Conservation Tools	Water Storage Tools	Regulatory / Administration Tools	Aquatic Habitat Tools	Monitoring Tools
			▪ Construct fish passage facilities where such facilities do not currently exist ▪ Relocate campgrounds further from stream edges where assessments show potential for erosion and other adverse effects ▪ Implement integrated noxious weed management program ▪ Update Wildlife Area Management Plans ▪ Implement BMPs ▪ Acquire conservation easements ▪ Amend or modify plans/ordinances to protect habitat or control floodplain development ▪ Continue Operation and Maintenance activities associated with past habitat improvement projects ▪ Replace open ditch conveyance systems for irrigation with lined ditches or piping ▪ Improve irrigation diversions for fish passage ▪ Install a screened lift pump system at irrigation diversions	implementation ▪ Monitor water conservation programs ▪ Monitor irrigation efficiency projects

Table 4-6 Tools to Address Aquatic Habitat Issues				
Conservation Tools	**Water Storage Tools**	**Regulatory / Administration Tools**	**Aquatic Habitat Tools**	**Monitoring Tools**
			■ Plant native grasses and shrubs along rural roads ■ Plant native grasses and shrubs within timber sale boundaries and roads ■ Develop a Habitat Conservation Plan (HCP) ■ Develop a Habitat Incentives Program (HIP) ■ Request local governments to develop regulations and/or programs to control sources of sediment ■ Integrate habitat improvement planning into flood hazard reduction plans ■ Support implementation of the recommendations of Washington's Forest and Fish Report ■ Re-establish historic wet meadow complexes	

4.7 Environmental Considerations for Applying the Strategies and Tools

Implementing any of the tools described in Appendix B will provide both benefits as well as potentially resulting in impacts to the human and natural environment. Prior to implementation of any of the tools provided, the responsible entity should thoroughly evaluate the federal, state, local and/or tribal regulatory and legal requirements involved in site selection, permitting, funding and planning the project. Further, some of the tools will require site specific analyses, assessment, and design prior to implementation, and may require continuous management, maintenance and other controls to be effective.

On July 18, 2003, the Washington Department of Ecology published the Statewide Environmental Impact Statement for Watershed Planning (http://www.ecy.wa.gov/biblio/0306013.html). This environmental impact statement describes the watershed planning process set forth in the Watershed Planning Act, as well as procedures for rule making that may be undertaken by state agencies to support implementation of watershed plans. It describes the existing framework of federal, state, and local laws, regulations, and programs that affect, or are related to management of watersheds. In addition, it evaluates the potential environmental impacts of and identifies mitigation measures, for various types or classes of recommended strategies/tools that may be included in watershed plans.

The information provided in the Statewide EIS or in this document is not intended to replace the requirement for a SEPA or NEPA environmental analysis and proposed mitigation, where applicable, for a site specific project.

Section 5
Basin Wide Management Objectives

5.1 Introduction

This section contains a detailed discussion of the planning objectives summarized in Section 2. Building off their initial set of objectives developed in Phase I, management objectives have been developed by the Planning Unit for each planning element, including: general objectives for the overall watershed planning and management effort; water quantity (surface and ground water) management; instream flow; water quality (surface and ground water) management; and aquatic habitat enhancement. The objectives generally fall into three categories: (1) objectives that enhance the planning effort itself, such as seeking better data on water resources or identifying specific sources of water quality problems; (2) objectives that address existing issues identified during the planning process; and (3) objectives that address future needs and long range planning and implementation.

5.2 Basin-wide Management Objectives

Basin-wide management objectives were identified by Planning Unit members through public workshops, in response to various technical assessments and supporting studies, and as additional concepts and/or issues emerged during the planning process. In identifying objectives and actions for the Implementation Areas in WRIA 35, objectives and actions common to most, if not all, of the entire basin were identified. Many of these general objectives and actions have translated into more specific objectives and actions in the Implementation Area action plans, demonstrating how basin-wide objectives apply in a specific geographic region. For convenience, objectives are numbered sequentially with the prefix BW (Basin Wide). The numbers do not imply or assign any priority, ranking or implementation order to the objectives and are used strictly for identification purposes.

General

BW1: Protect existing water rights, private property rights and tribal treaty rights.

BW2: Emphasize voluntary and incentive-based management solutions, including Continuous Conservation Resource Program (CCRP) and Conservation Security Program (CSP).

BW3: Maintain and enhance regional economy and provide future economic opportunities associated with the watershed hydrology, including but not limited to municipal, residential, commercial, industrial, agricultural, recreational, tourism, and instream water uses.

BW5: Establish a detailed funding plan for implementation, including: projects; programs; long-term monitoring and evaluation of watershed plan implementation.

BW6: Encourage fairness in distributing costs and burdens of water resource management actions.

BW7: Improve consistency in federal, state, and local water resources regulatory and management approaches, and obtain local, state, and federal and tribal buy-in and cooperation for recommended management strategies.

BW8: Review and update land use plans and regulations as necessary to be compatible with and support water resource management goals.

BW9: Support implementation of urban and rural land management BMPs.

BW10: Establish and maintain ongoing water resource management education and outreach, addressing topics including water use, conservation, reclamation, reuse, stormwater management and best management practices.

BW11: Restore and enhance natural floodplain, riparian and wetland capacities, where feasible, to increase aquifer recharge, improve water quality, provide aquatic and riparian habitat, and reduce the duration and severity of flood events.

BW12: Develop and implement noxious weed control programs, with a focus on public lands.

BW13: Improve scientific basis, including use of bio-assessment performance measures (e.g., indicator species) for understanding baseline conditions and measuring watershed enhancements

Water Quantity

BW14: Provide long-term reliable and predictable water supplies for municipal, residential, commercial, industrial, agricultural, recreational, and instream water uses.

BW15: Continue and improve instream flow and water quality monitoring through permanent and seasonal gauges providing baseline data needed to manage flows and facilitate future water management decisions.

BW16: Characterize surface and ground water availability and recharge/discharge balance and connectivity within the sub-basins and surrounding region to ensure adequate long term ground water resources to meet existing and needs, consistent with adopted city and county land use plans.

BW17: Encourage stormwater and/or wastewater reclamation and reuse to satisfy other water resource needs.

BW18: Identify and develop opportunities to enhance available water supply, emphasizing offstream storage, aquifer storage and recovery, source substitution, reclamation and reuse, and stormwater retention.

BW18: Promote conservation and efficiency of water use, including but not limited to municipal, residential, commercial, industrial, agricultural, recreational, and instream water uses.

BW19: Improve certainty, timeliness and efficiency in water rights decisions.

Water Quality

BW20: Protect surface and ground water quality needed for public drinking water supplies and other uses (including but not limited to municipal, residential, commercial, industrial, agricultural, recreational, and instream water uses).

BW21: Improve water quality to the extent practicable given the natural conditions[1].

BW22: Manage stormwater in both urban and rural areas to improve water quality, reduce flooding and enhance aquifer recharge where practicable.

BW23: Review state surface water quality standards and establish natural (system potential) temperature levels for streams and rivers that reflect conditions within the watershed.

[1] According to the Washington Department of Ecology (Ecology) and U.S. Environmental Protection Agency (EPA), "natural conditions" is defined as the surface water quality that would exist in the absence of human-caused pollution or disturbances. In assessing what constitutes "natural conditions," Ecology uses historic data and water quality monitoring data, as appropriate, to ascertain what the water quality conditions (e.g. temperature and dissolved oxygen) would be without human sources of degradation. This approach does not infer that Ecology's position is that systems can or should be returned to natural conditions, but rather that some sources of human degradation cannot be remedied due to technical and/or social (legal) limitations (Ecology, 2005).

Section 6
Implementation Area Strategies

Specific objectives and actions identified for each of the five implementation areas: Asotin Creek, Middle Snake River, Pataha Creek, Tucannon River and the Grande Ronde. These area-specific objectives and actions are based upon the existing conditions set forth in Section 3, input from the planning workshops, and consideration of basin-wide objectives described in Section 5.

6.1 Asotin Creek Implementation Area Planning Objectives and Actions

The Asotin Creek Implementation area includes the City of Asotin and portions of rural Asotin and Garfield counties. Based on population projections, the implementation area will grow from approximately 2,486 (year 2000) to 2,680 (year 2020), with virtually all of the growth occurring in the City of Asotin. The City of Asotin's municipal, residential, and commercial water needs are estimated to increase by approximately 81 afy by the year 2020. Water use in the rural areas has been estimated to decrease by approximately 20 afy in Asotin County and increase slightly by 1 afy in Garfield County. Current agricultural water use is relatively small, consisting of an estimated 676 afy with the majority of the water used diverted from Asotin Creek. Most of the irrigated agricultural land is pasture used for livestock grazing. Agricultural water use is not projected to increase and the available water (based on water rights) is considered adequate to meet existing and future demands. Overall, approximately 43% of the Asotin Creek sub-basin is in pasture or rangeland, 26% is in cropland (primarily non-irrigated), and 30% is in forest.

Several aquatic habitat restoration and protection projects have already been implemented within this area by federal, state, tribal and local agencies and private organizations (see Exhibits in Section 3 by Implementation Area for projects completed by conservation districts). Projects, detailed in the Asotin Inventory used in developing the sub-basin plan, focused on several key issues: upland issues, riparian restoration projects, instream projects, and monitoring activities. The projects themselves involved a wide range of activities, including:

- Instream habitat construction/bioengineering
- Direct seeding
- Establishment of permanent grasses/pastures/haylands
- Sediment basin construction/maintenance
- Upland multi-purpose pond construction
- Terrace construction
- Reforestation/tree planting
- Spring development
- Erosion control (critical area planting, grassed waterways, conservation cover, noxious weed control)
- Pipeline installation
- Riparian planting

- Riparian fencing
- Road decommissioning

Implementation of these and other similar types of projects by the participating agencies are expected to continue.

Specific objectives for the Asotin Creek Implementation Area are provided below. These are in addition to the Basin-wide objectives and actions described in Section 5. For convenience, objectives are numbered sequentially with the prefix AC (Asotin Creek). The numbers do not imply or assign any priority to the objectives.

AC1: Improve water delivery, reliability and efficiency of individual agricultural irrigation systems; and thereby improve instream flows in Asotin Creek.

AC2: Continue instream flow and water quality monitoring through permanent and seasonal gauges to improve baseline data needed to evaluate instream flow enhancement efforts regulate proposed New Appropriations Flow (minimum instream flow) on Asotin Creek and facilitate future water management.

AC3: Recommend and establish instream flow minimum and non-regulatory enhancement target flow for Asotin Creek.

AC4: Develop additional water supply of 81 afy to provide future needs of City of Asotin; ground water is the preferred source assuming sufficient ground water is available to provide a sustainable supply.

AC 5: Identify sources and reduce fecal coliform and TSS levels in Asotin Creek as measured at the mouth of Asotin Creek, on Tenmile Creek and Couse Creek.

AC6: Increase base flows in Asotin Creek, Tenmile Creek and Couse Creek to improve aquatic habitat, through floodplain connectivity and small storage, to the extent not limited by natural hydrology.

AC7: Lower water temperatures in Lower George Creek, Upper Asotin Creek, Lower South Fork Asotin Creek, Tenmile Creek, and Couse Creek to the extent not limited by the natural hydrology to improve aquatic habitat and water quality.

AC8: Implement aquatic habitat restoration strategies/projects (Table 6-1) in the priority restoration areas identified in the April 2005 Draft Salmon Recovery Plan. Desired Future Conditions for Asotin Creek are to restore riparian function, restore floodplain connectivity, eliminate passage barriers, and increase instream flow. Priority locations include Upper Asotin Creek: Headgate Dam to the forks; Lower South Fork Asotin Creek; Lower North Fork Asotin Creek, Charlie Creek, and Lower George Creek. Implement passive restoration projects in the following SRP identified tributaries: Almota Creek (mouth to Little Almota Creek, Little Almota Creek to Second Little Almota Creek, Second Little Almota Creek to unnamed right bank tributary, unnamed

right bank tributary to fork), North Branch of Almota Creek: mouth to access limit, Tenmile Creek (mouth to seasonally de-watered area, dewatered area to Middle Branch.[1])

AC9: Implement aquatic habitat protection objectives/projects (Table 6-1) for areas of high quality habitat, including all priority restoration areas; Upper North Fork of Asotin Creek; Upper South Fork of Asotin Creek; Upper George Creek; Asotin Creek Headwaters areas in George Creek, Charlie Creek, North Fork and South Fork; Asotin Creek; North Fork of Asotin Creek tributaries: South Fork of North Fork Asotin Creek and Middle Branch.

AC10: Improve fish passage conditions through screening upgrades and the removal of fish passage barriers.

AC11: Encourage the reduction of fuels on federal and state forestlands, using tools such as managed grazing [grass banking], prescribed burns, and selected timber management.

AC12: Identify sediment sources in Asotin, Tenmile and Couse Creek drainages.

AC13: Continue to identify opportunities and funding for road decommissioning, noxious weed control and erosion control.

AC14: Explore the opportunities and funding potential for regionalizing wastewater treatment and connecting septic systems on fringe urban areas into existing systems. Identify appropriate funding sources for implementation.

AC15: Use CREP for riparian restoration and CRP for upland restoration of degraded environments

AC16: Develop a stormwater management plan

AC17: Landowner education on practical BMP's and the use of CREP/CRP and other programs

Specific projects, actions, and additional necessary studies are identified in Table 6-2. They are organized by planning element to meet the area-specific objectives described above, as well as the basin-wide objectives provided in Section 5.

[1] (Passive restoration is defined as "any ordinance, contract, or project that significantly reduces the amount of disturbance in the riparian zone" (SRSRC 2004). It includes such measures as Conservation Reserve Expanded Program riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration. Passive restoration can also be termed "natural healing.")

Table 6-1

Desired Future Habitat Conditions for Asotin Creek Expressed in Percent Restoration of Historical Conditions (Draft SRSRP, 2005)

Geographic Area	Fine Sediment	Substrate Embeddedness	Turbidity	Pools	Pool Tailouts	Backwater Pools	Carcass Loading[a]	Benthic Production[a]	Woody Debris	Riparian Function	Temperature Maximum	Bed Scour	Artificial Confinement	Low Flow	Minimum Channel Width
Lower North Fork	49%	49%	49%	51%	51%	27%	10%	10%	54%	42%	–	50%	25%		–
Lower South Fork	100%	100%	100%	29%	29%	13%	10%	10%	25%	25%	100%	–	25%	–	–
Upper Asotin	50%	50%	50%	67%	67%	11%	10%	10%	21%	25%	100%	–	33%	–	–
Charley Creek	55%	55%	55%	47%	47%	34%	10%	10%	69%	25%	100%	41%	31%	–	–
Middle Asotin[b]	25%	25%	25%	–	–	15%	10%	10%	29%	25%	83%	–	–	–	–
Lower Asotin[b]	50%	50%	50%	–	–	19%	10%	10%	38%	56%	83%	–	–	–	–
Lower George	81%	81%	81%	65%	54%	38%	10%	10%	75%	22%	100%	66%	17%	50%	75%

[a] LWD addition assumed to increase carcass retention, benthic production and area of backwater pools.

[b] Only LWD and Riparian actions target this area directly, but beneficial effects of upstream sediment loading and temperature reduction programs are assumed to propagate downstream.

The planning elements discussed in this document include:

- Water quantity management
- Water quality management
- Aquatic habitat enhancement
- Regulatory actions
- Miscellaneous studies

Where specific projects for each planning element are not identified, refer to the basin-wide management strategies for more general actions on what is intended for a given planning element in the implementation area. Exhibit 6-1 identifies some areas of known water quality and/or aquatic habitat issues where management actions should be targeted.

Table 6-2
Asotin Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Water Quantity Management						
1	AC1	Individual irrigators (throughout area)	Asotin CD	Improve irrigation efficiencies, including conveyance and application methods.	By 2010	Medium
2	AC1	Individual irrigators (throughout area)	Asotin CD	Upgrade diversions to include meters where needed	By 2010	Medium
3	AC1	Owners/operators of Non-exempt wells throughout area	Ecology	Upgrade wells to include meters where needed	By 2015	Medium
4	AC2	Asotin Creek	USGS, Ecology, and Asotin PUD	Continue instream flow monitoring through permanent and seasonal gauges on Asotin Creek.	Ongoing	Low
5	AC4	City of Asotin	City of Asotin	Characterize ground water conditions to determine if an additional 81 afy withdrawal from ground water is sustainable	By 2010	High
6	AC4	City of Asotin	City of Asotin	Seek additional water rights to develop additional water supply of 81 afy from ground water to provide future needs of City of Asotin, if study determines withdrawal is sustainable	By 2015	High
Water Quality Management						
7	AC5	Asotin Creek, Tenmile Creek, Couse Creek	WDA, Asotin CD	Identify sources and implement the following strategies to reduce fecal coliform levels on Asotin Creek: 1. manure management (6 locations on Asotin Ck, 2 on Couse Ck, 3 on Tenmile Ck) 2. upgrade or connect septic to sewer 3. explore opportunities for regionalization of wastewater treatment plant 4. connect fringe rural areas to urban sewer systems	By 2010	Low
8	AC5	Asotin Creek		Implement the following strategies to	By 2010	Low

Table 6-2
Asotin Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
	AC15			reduce TSS levels at the mouth of Asotin Creek: 1. direct seed 2. upland management BMPs 3. riparian improvement CRP 5. grassed waterways 6. sediment basins 7. weed control 8. grazing management 9. cross fencing 10. alternative water sources 11. manure management (livestock operations)		
9	AC7	Lower George Creek, Upper Asotin Creek, and Lower S Fork Asotin Creek		Implement strategies to reduce water temperatures		
10	AC16	Drainage facilities on rural roads	Asotin and Garfield Counties	Adopt the Eastern Washington Stormwater manual and implement the following strategies to improve stormwater management and treatment and increase groundwater infiltration: 1. sediment basins 2. infiltration trenches 3. swales/wetlands 4. rural/urban drainage ditch upgradest and treatment	Plan by 2007 Implement by 2015	Medium
11	AC6	Entire IA	Asotin and Garfield Counties	Identify and designate aquifer recharge areas	Ongoing	Low
12	AC6	Entire IA	Asotin and Garfield Counties	Protect known aquifer recharge areas through critical area ordinances	Ongoing	Low
13	AC17	Entire IA	WSU Cooperative Extension, Ecology	Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: 1. restore riparian areas 2 urban/rural education program	Ongoing	Low

Table 6-2
Asotin Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
				3 conservation tillage		
	AC17	Entire IA	Asotin and Garfield Counties, NRCS, WDFW, USFS, and WSU Coop Extension	Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: 1. maintain existing CRP acres (including exploring alternative funding) 2. conservation tillage 3 increase grassed waterways 4 buffers 5 strip cropping 6 improve riparian grazing management	Ongoing	Low
Aquatic Habitat Enhancement						
14	AC8 AC9	Upper Asotin Creek: Headgate Dam to the forks; Lower South Fork Asotin Creek; Lower North Fork Asotin Creek, Charlie Creek, and Lower George Creek ;	WDFW/CD/Nez Perce	Implement aquatic habitat restoration plans; including the following priority projects: 1. Enhancement Restoration 2. Protection and Restoration of Asotin Creek 3. Asotin County Fish Screening 4. Riparian Buffers 5. Upland Sediment Reducation 6. Large Woody Debris Replenishment and Replacement Enhancement	By 2010	Low

Table 6-2 Asotin Creek Implementation Area Actions						
Action (non-prioritized)	**Supported Objectives**	**Location**	**Lead Agency**	**Description**	**Schedule [1]**	**Cost [2]**
15	AC8	Almota Creek (mouth to Little Almota Creek, Little Almota Creek to Second Little Almota Creek, Second Little Almota Creek to unnamed right bank tributary, unnamed right bank tributary to fork), North Branch of Almota Creek: mouth to access limit, Tenmile Creek (mouth to seasonally de-watered area, dewatered area to Middle Branch.	WDFW/CD/Nez Perce	Implement passive restoration projects, including Conservation Reserve Expanded Program riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration		
16	AC9	Upper North Fork of Asotin Creek; Upper South Fork of Asotin Creek; Upper George Creek; Asotin Creek Headwaters areas in George Creek, Charlie Creek, North Fork and South Fork; Asotin Creek; North Fork of Asotin Creek tributaries: South Fork of North Fork Asotin Creek and Middle Branch.	WDFW/CD/Nez Perce	Implement aquatic habitat protection plans, including list of prioritized projects 1.Enhancement Restoration 2. Protection and Restoration of Asotin Creek 3. Asotin County Fish Screening 4. Riparian Buffers 5. Upland Sediment Reducation 6. Large Woody Debris Replenishment and Replacement Enhancement	By 2010	Low
17	AC10	See project description	WDFW/CD	Remove the following fish passage obstructions:		
				Headgate Dam, Asotin Creek, river mile 9.1	Ongoing	Low

Table 6-2
Asotin Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
				Trent Grade culvert, George Creek, river mile 18.8	By 2010	Low
				Asotin Road culvert, Charley Creek, river mile 0.2	By 2010	Low
				Mill Creek Road culvert, Mill Creek, river mile 2.9	By 2010	Low
				Pond Dam, Tenmile Creek, river mile 15.3	By 2010	Med
18	AC10	Entire IA	WDFW/CD/Nez Perce	Conduct inventory and analysis of other fish passage barriers, and prioritize for removal	By 2010	Low
19	AC10	Lower Asotin Creek, Middle Asotin Creek, Upper Asotin Creek, Lower George Creek, and Charley Creek	WDFW/CD	Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.	By 2010	Med
20	AC7	Lower George Creek Upper Asotin Creek Lower South Fork Asotin Creek	WDFW	Restore areas of degraded riparian vegetation on private and public land through activities such as CREP and CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas	By 2020	Medium
21	AC9	Upper reaches/headwater areas	USFS, Asotin and Garfield Counties	Work with private and public landowners to maintain and enhance pristine and other areas of the headwaters by encouraging application of BMPs	Ongoing	Low
Regulatory Actions						
22	AC3, AC6		Ecology	Establish minimum instream flows for Asotin Creek	By 2007	Medium

Table 6-2
Asotin Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
23	AC3		Ecology	Establish administrative stream closures, to include all Asotin Creek tributaries (timeframe to be determined)	By 2007	Low
24	AC9	Entire IA	Asotin and Garfield Counties, WDFW, USFS	Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.	Ongoing	Low
25	AC9	Entire IA	Asotin and Garfield Counties, WDFW, USFS	Review and update, as needed, best-available-science-based riparian buffer zones and critical areas regulations.	Ongoing	Low
Miscellaneous Studies						
26	AC4	Entire IA	City of Asotin, Ecology	Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals to meet City of Asotin needs.	By 2007	Medium
27	AC12	Entire IA	WDFW, CDs	Identify specific stream fords that could be eliminated by installing bridges or culverts. Pursue project funding	By 2020	Medium

Notes:
1) Schedule: Suggested dates have been provided or a range, where: Near-term=0-3 years; Mid-term=3-10 years; Long-term=10 years or more beyond date of plan adoption.
2) Estimated costs have been provided where available from feasibility or other studies. Otherwise, a cost range is provided where: Low=<$100,000; Medium=$100,000-$500,000; High= >$500,000

Exhibit 6-1: Management Actions for Asotin Creek Implementation Area

EXHIBIT UNDER DEVELOPMENT

6.2 Middle Snake River Implementation Area Planning Objectives and Actions

The Middle Snake River Implementation area drains the area between the City of Clarkston and Little Goose Dam (RM 70). Only a small amount of runoff occurs along the Middle Snake River downstream of the Clearwater River confluence. Other major tributaries to the Middle Snake River include Alkalai Flat Creek, Deadman Creek, and Alpowa Creek. The Middle Snake River implementation area is composed of portions of Columbia, Whitman, Garfield, and Asotin counties. The City of Clarkston and adjacent urban area is the largest population center in the watershed, with a population 18,661 in 2000. The Clarkston urban area includes the majority of residential, commercial and industrial development in the implementation area. Asotin PUD provides water service to the City of Clarkston and associated urban areas. Agriculture is the primary land use in the implementation area, and is dominated by non-irrigated farming in the uplands, small areas of irrigated farming in the lower valleys, and cattle ranching. Little forestry activity occurs in this area. Lands adjacent to the Lower Snake River are primarily privately owned; public lands adjacent to the reservoirs are managed by the USACE, with a few parcels owned by the State. Population within the implementation area is expected to grow by almost 4,000 in the year 2020, primarily in the Clarkston urban area. Projected increases in area water demands through the year 2020 (from a projected increased demand from the City of Clarkston and adjacent urban areas) are well within the current capacity of existing Asotin PUD water rights.

Several aquatic habitat restoration and protection projects have already been implemented within this area by federal, state, tribal and local agencies and private organizations. Since 1996, projects implemented within the sub-basin have focused mainly on improving agricultural practices to limit impacts on water quality and quantity. The projects themselves involved a wide range of activities, including:

- Two Pass seeding
- Direct seeding
- Fencing
- Grasses and legumes in rotation
- No-till seeding
- Pasture and hay land planting
- Sediment basins
- Strip cropping
- Subsoiling
- Terraces
- Grassed waterways

Specific objectives for the Middle Snake River Implementation Area are provided below. These are in addition to the Basin-wide objectives and actions described in Section 5. For convenience, objectives are numbered sequentially with the prefix MS (Middle Snake). The numbers do not imply or assign any priority to the objectives.

MS1: Continue instream flow and water quality monitoring through permanent and seasonal gauges to improve baseline data needed to evaluate instream flow enhancement efforts on Alkali Flat Creek, Alpowa Creek, Deadman Creek, Meadow Gulch Creek, Penawawa Creek, South Meadow Creek, and Wawawai Creek and facilitate future water management.

MS2: Reduce sediment, fecal coliform, TSS, temperature and dissolved oxygen levels in Alkali Flat Creek, Alpowa Creek, Deadman Creek, Meadow Gulch Creek, Penawawa Creek, South Meadow Creek, and Wawawai Creek to improve aquatic habitat.

MS3: Implement aquatic habitat restoration strategies/projects (Table 6-3) in the following priority restoration areas identified in the April 2005 Draft Salmon Recovery Plan: Deadman /Meadow Creek, Penawawa Creek, and Alkali Flat Creek. Implement passive restoration projects in the following SRP identified tributaries: Deadman, Ping Creed to Lynn Gulch Creek; Deadman, Lynn Gulch to forks; and South Fork Deadman, mouth to access limit.

MS4: Implement aquatic habitat protection objectives/projects (Table 6-3) for areas of high quality habitat, including all priority restoration areas listed in MS4[2]

MS5: Address imminent threats to steelhead including passage barriers/obstructions, inadequate fish screens, and areas of streams that seasonally go dry).

MS6: Develop and enhance water supply for irrigated agriculture and stock water on Deadman Creek, Alkalai Flat, Meadow Creek and Almota Creek.

MS7: Continue to enhance riparian areas through Middle Snake River subbasin.

MS8: Conduct groundwater hydrology study near Clarkston to determine if additional withdrawal would be sufficient to meet current and future demand.

MS9: Develop stormwater management plan.

MS10: Develop designated aquifer recharge areas.

MS11: Use CREP for riparian restoration and CRP for upland restoration of degraded environments.

MS12: Establish SWSLs, administrative closures, MIFs, and enhancement flows where appropriate.

MS13: Educate public landowners concerning BMP's

[2] other priority areas may be identified as more habitat and demographic information on steelhead populations becomes available.

Table 6-3

Desired Future Habitat Conditions for Deadman Creek (within the Middle Snake Implementation Area) Expressed in Percent Restoration of Historical Conditions (Draft SRSRP, 2005)

Reach	Fines	Embeddedness	Turbidity	Riparian Function	Woody Debris	Pools	Temperature
Deadman Creek embayment	–	–	–	–	14%	–	–
Deadman Creek, embayment to Willow Gulch Creek	–	–	–	–	14%	–	–
Deadman Creek, Willow Gulch Creek to Ping Gulch Creek	–	–	–	–	14%	–	–
Ping Gulch Creek, mouth to bridge at Leonard property	–	–	–	–	14%	–	–
Deadman Creek, Ping Gulch Creek to Lynn Gulch Creek	35%	35%	35%	17%	14%	14%	100%
Lynn Gulch Creek, mouth to perched culvert near mouth	–	–	–	–	14%	–	–
Lynn Gulch Creek, culvert to historical access limit at confluence of East. Lynn Gulch Creek	–	–	–	–	14%	–	–
Deadman Creek, Lynn Gulch Creek to confluence of NF and SF Deadman	27%	27%	27%	25%	14%	14%	–
NF Deadman Creek, mouth to current access limit at intermittent zone	–	–	–	–	14%	–	–
NF Deadman Creek, end of current access zone to historical access limit at forks of NF	–	–	–	–	14%	–	–
SF Deadman Creek, mouth to access limit at confluence of SF Deadman Gulch	50%	50%	50%	–	14%	14%	–

Specific projects, actions and additional studies are identified in Table 6-4 organized by planning elements, to meet the area-specific objectives described above and basin-wide objectives provided in Section 5. Where specific projects for each planning element are not identified, refer to the basin-wide management strategies for more general actions on what is intended for a given planning element in the implementation area. Exhibit 6-2 identifies some areas of known water quality and/or aquatic habitat issues where management actions should be targeted.

Table 6-4
Middle Snake River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Water Quantity Management						
1	MS1	Alkali Flat Creek, Alpowa Creek, Deadman Creek, Meadow Gulch Creek, Penawawa Creek, South Meadow Creek, Wawawai Creek	USGS, Ecology, and Asotin PUD	Continue instream flow monitoring through permanent and seasonal gauges.	Ongoing	Low
2	MS8	City of Clarkston and urban area	Asotin PUD	Characterize ground water conditions to determine if an additional 1,160 afy withdrawal from ground water is sustainable	By 2010	Med
3	MS8	Entire IA	USGS, Ecology	Characterize basalt groundwater sources, availability and sustainability near Snake River and below, where basalt is connected to Snake River	By 2015	Med
4	MS8	Entire IA	USGS, Ecology	Sole source aquifer study	By 2015	Med
5	MS8	Pataha IA	Ecology, irrigators	Characterize ground water conditions to determine if additional withdrawals to replace some of the existing surface water withdrawals for irrigation is possible and sustainable	By 2010	High
6	MS8	Pataha IA	Ecology, irrigators	Seek additional water rights to develop additional water supply from ground water to replace surface water withdrawals for irrigation if study determines withdrawal is sustainable	By 2015	High
Water Quality Management						
7	MS2	Alpowa Creek	Ecology	Investigate sources and implement appropriate strategies to reduce fecal coliform levels on Alpowa Creek.	By 2010	Low
8	MS1	Entire IA	Ecology	Continue water quality monitoring through permanent and seasonal gauges for temperature, fecal coliform, dissolved oxygen, sediment and TSS.	By 2010	Low
9	MS9	Drainage facilities on	Asotin and Garfield	Implement the following strategies to	Plan by 2007	Medium

Table 6-4
Middle Snake River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
		state rural roads	Counties, WSDOT	improve stormwater management and treatment and increase groundwater infiltration: 1. Implement rural road BMPs 2. Shaping/ grading 3. mowing vs. spraying	Implement by 2015	
10	MS10	Entire IA	Asotin and Garfield Counties	Identify and designate aquifer recharge areas	Ongoing	Low
11	MS10 MS4	Entire IA, City of Clarkston	Asotin and Garfield Counties	Protect known aquifer recharge areas through critical area ordinances	Ongoing	Low
12	MS13	Entire IA	WSU Cooperative Extension, Ecology	Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: 1. restore riparian areas 2 urban/rural education program 3 conservation tillage	Ongoing	Low
13	MS13	Entire IA, with early emphasis on Steptoe Creek	Asotin and Garfield Counties, NRCS, WDFW, USFS, and WSU Coop Extension	Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: 1. noxious weed control 2. maintain existing CRP acres (including exploring alternative funding) 3. conservation tillage 4. increase grassed waterways 5. buffers 6. strip cropping 7. improve riparian grazing management	Ongoing	Low
Aquatic Habitat Enhancement						
14	MS4	Deadman /Meadow Creek, Penawawa Creek, and Alkali Flat Creek.	WDFW, CDs and Tribes	Implement aquatic habitat protection plans, including list of prioritized projects	By 2010	Low
15	MS3	Deadman, Ping Creek	WDFW, CDs, Tribes	Implement passive restoration projects,		

Table 6-4
Middle Snake River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
15		to Lynn Gulch Creek; Deadman, Lynn Gulch to forks; and South Fork Deadman, mouth to access limit.		including Conservation Reserve Expanded Program riparian buffers, conservation easements, land acquisition, and, where appropriate, upland projects designed to reduce sediment delivery and increase filtration		
16	MS5	Entire IA	WDFW and CD	Remove the following fish passage obstructions:		
				Headcut, Almota Creek, river mile 1.1	Ongoing	Low
				Lynn Gulch culvert, Deadman Creek, river mile 0.4	By 2010	Low
				Perched culvert, Wawawai Creek, river mile 0.1	By 2010, or sooner	Low
				Sediment deposition in delta, Steptoe Creek, river mile 0.0	By 2010, or sooner	Low
				1st road crossing culvert, Steptoe Creek, river mile 0.2	By 2010, or sooner	Med
				2nd road crossing culvert, Steptoe Creek, river mile 0.8	By 2010	Med
				Headcut falls, Alkali Flat Creek, river mile 7.0	By 2010	Low
17	MS12	Entire IA	WDFW and CDs	Conduct inventory and analysis of other fish passage barriers, and prioritize for removal	By 2010	Low
18	MS5	Deadman Creek	Ecology and CDs	Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.	By 2010	Low
19	MS11	Deadman Creek Steptoe Creek Wawawai Creek	WDFW	Restore areas of degraded riparian vegetation on private and public land through activities such as CREP, CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.	By 2020	Medium
Regulatory Actions						
20	MS12	Deadman Creek	Ecology	Establish administrative stream	By 2007	Low

Table 6-4
Middle Snake River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
		Steptoe Creek Wawawai Creek		closures (time period to be determined) (close water use for storage)		
21	MS4	Entire IA	Asotin, Garfield and Whitman Counties, WDFW, USFS	Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.	Ongoing	Low
22	MS4	Entire IA	Asotin, Garfield and Whitman Counties, WDFW, USFS	Review and update, as needed, best-available-science-based riparian buffer zones and critical areas regulations.	Ongoing	Low
Miscellaneous Studies						
23	MS2 MS3	Entire IA	WDFW, Asotin and Garfield Counties	Identify specific stream fords that could be eliminated by installing bridges or culverts.	By 2020	Medium

Notes:
1) Schedule: Suggested dates have been provided or a range, where: Near-term=0-3 years; Mid-term=3-10 years; Long-term=10 years or more beyond date of plan adoption.
2) Estimated costs have been provided where available from feasibility or other studies. Otherwise, a cost range is provided where: Low=<$100,000; Medium=$100,000-$500,000; High= >$500,000

Exhibit 6-2: Management Actions for Middle Snake River Implementation Area

EXHIBIT UNDER DEVELOPMENT

6.3 Pataha Creek Implementation Area Planning Objectives and Actions

The Pataha Creek sub-basin drains into the Tucannon River at River Mile 11.2. Although in other studies it has been included as part of the Tucannon River sub-basin, it is described as a separate implementation area because of unique characteristics that differentiate it from the rest of the Tucannon sub-basin. Pataha Creek drains 114,166 acres (185 sq. mi.). Major tributaries of Pataha Creek are seasonal streams that include Dry Pataha Creek, Sweeney Gulch, Bahmaier Gulch, Linville Creek, Tatman Gulch, and Dry Hollow. The Pataha Creek subbasin encompasses portions of Columbia and Garfield Counties. The primary land use is agriculture, mainly non-irrigated cropland farming and livestock production. The primary city is the City of Pomeroy, located on Pataha Creek in the northeastern portion of the subbasin. The City of Pomeroy had a population of 1,517 in 2000. Population in the basin is projected to grow by less than 200, with most or all of the growth occurring in the City of Pomeroy.

Several aquatic habitat restoration and protection projects have already been implemented within this area by federal, state, tribal and local agencies and private organizations. Since 1996, projects implemented within the Tucannon River sub-basin (inclusive of the Pataha Creek sub-basin) have focused mainly on upland issues, riparian restoration, instream habitat enhancement and CRP/CREP.

Specific objectives for the Pataha Creek Implementation Area are provided below. These are in addition to the Basin-wide objectives and actions described in Section 5. For convenience, objectives are numbered sequentially with the prefix PC (Pataha Creek). The numbers do not imply or assign any priority to the objectives.

PC1: Develop and continue instream flow and water quality monitoring through permanent and seasonal gauges to improve baseline data needed to evaluate instream flow enhancement efforts and facilitate future water management.

PC2: Provide for additional water supply of 62 afy to meet estimated demand increases of City of Pomeroy; existing City groundwater rights are the preferred source assuming sufficient ground water is available to provide a sustainable supply.

PC3: Reduce sediment, fecal coliform, temperature, and pH levels in lower and middle Pataha Creek to improve aquatic habitat.

PC4: Develop salmonid aquatic habitat restoration and/or protection strategies / objectives for Pataha Creek – no priority areas identified in April 2005 Draft Salmon Recovery Plan.

PC5: Improve fish passage conditions through screening upgrades and the removal of fish passage barriers.

PC6: Encourage beaver activity in the Lower Pataha (from Dodge downstream) for multi-purpose storage (through dams, wetlands and water retention)

PC7: Develop groundwater rights to supplant surface water rights that are currently being used for irrigation

PC8: Improve irrigation efficiency.

PC9: Protect aquifer recharge areas, as well as other critical or pristine areas.

PC10: Educate public landowners concerning BMP's.

PC11: Restore areas or degraded riparian vegetation on public and private lands.

PC12: Develop additional water sources to accommodate future growth.

Specific projects, actions and additional studies are identified in Table 6-5 organized by planning elements, to meet the area-specific objectives described above and basin-wide objectives provided in Section 5. Where specific projects for each planning element are not identified, refer to the basin-wide management strategies for more general actions on what is intended for a given planning element in the implementation area. Exhibit 6-3 identifies some areas of known water quality and/or aquatic habitat issues where management actions should be targeted.

Table 6-5
Pataha Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Water Quantity Management						
1	PC1	Pataha Creek	USGS and Ecology	Continue/expand instream flow monitoring through permanent and seasonal gauges on Pataha Creek.	Ongoing	Low
2	PC2	City of Pomeroy	City of Pomeroy, Ecology	Characterize ground water conditions to determine if an additional 62 afy withdrawal from ground water is sustainable	By 2010	High
3	PC2	City of Pomeroy	City of Pomeroy, Ecology	Develop additional water supply of 62 afy from ground water to provide future needs of City of Pomeroy if study determines withdrawal is sustainable	By 2015	High
4	PC2	Pataha IA	Ecology, irrigators,	Characterize ground water conditions to determine if additional withdrawals to replace some of the existing surface water withdrawals for irrigation is possible and sustainable	By 2010	High
5	PC7	Pataha IA	Ecology, irrigators,	Seek additional water rights to develop additional water supply from ground water to replace surface water withdrawals for irrigation if study determines withdrawal is sustainable	By 2015	High
6	PC8	Pataha IA	Irrigators, Pomeroy CD	Identify opportunities for irrigation efficiency	By 2010	Low
7	PC6	Lower Pataha	WDFW, Pomeroy CD	Implement pilot project to encourage beaver activity for multi-purpose storage through dams, wetlands and water retention	By 2010	Low
Water Quality Management						
8	PC6	Pataha IA	Ecology, Pomeroy CD, Garfield County	Implement the following strategies to reduce fecal coliform levels in Pataha Creek: 1. identify failing septic systems 2. Restore riparian buffers 3. Manage grazing in riparian areas	By 2010	Low
9	PC3	Lower & middle Pataha	Ecology, Garfield	Implement the following strategies to	By 2010	Low

Table 6-5
Pataha Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
		Creek	County, individual landowners	reduce TSS levels in Pataha Creek by reducing the sediment load entering the creek: 1. CRP 2. conservation tillage 3. increase grassed waterways 4. buffers 5. strip cropping 6. improve riparian grazing management		
10	PC3	Lower & middle Pataha Creek	Ecology, Garfield County	Implement the following strategies to reduce water temperatures: 1. riparian enhancement	By 2010	Medium
11	PC9	Entire IA	Garfield County	Protect known aquifer recharge areas through critical area ordinances; include areas necessary to protect City of Pomeroy's water source (spring).	Ongoing	Low
12	PC10	Entire IA	WSU Cooperative Extension, Ecology	Work with individual landowners to review pesticide and fertilizer use; and to implement best management practices to limit water quality impacts: 1. restore riparian areas 2. urban/rural education program 3. conservation tillage	Ongoing	Low
13	PC10	Entire IA	Garfield County, NRCS, WDFW, USFS, and WSU Coop Extension	Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: 1. conservation tillage 2. increase grassed waterways 3. buffers 4. strip cropping 5. improve riparian grazing management	Ongoing	Low
Aquatic Habitat Enhancement						
14	PC5	Entire IA	WDFW and CDs	Conduct inventory and analysis of fish passage barriers, and prioritize for removal	By 2010	Low

Table 6-5 Pataha Creek Implementation Area Actions						
Action (non-prioritized)	**Supported Objectives**	**Location**	**Lead Agency**	**Description**	**Schedule [1]**	**Cost [2]**
	PC5	Pataha Creek	WDFW and CDs	Evaluate fish screens on water diversions for adequacy. Replace inadequate screens as necessary.	By 2010	Med
15	PC4 PC11	Entire IA	WDFW and CD	Restore areas of degraded riparian vegetation on private and public land through activities such as CREP, CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.	By 2020	Medium
16	PC11	Entire IA	WDFW and CD	Restore areas of degraded riparian vegetation on private and public land through conservation easements with an early emphasis on the most degraded areas.	By 2020	Medium
17	PC10	Entire IA	USFS, Garfield County	Work with private and public landowners to use best management practices to maintain and enhance pristine and other areas of the headwaters by applying BMPs	Ongoing	Low
18	PC5	See project descriptions	Ecology, WSDOT, Garfield County, City of Pomeroy	Remove fish passage obstructions		
				Highway 261 Culvert at Delaney, Pataha Creek, river mile 1.3	By 2007	Medium
				Dodge Bridge, Pataha Creek, river mile 10.8	By 2007	High
				20th St Sewer Line (City of Pomeroy), Pataha Creek, river mile 25.7	By 2007	Medium
				Rock Shelf, Pataha Creek, river mile 35.2	By 2010	Low
				Old Bihmaier Dam, Bihmaier Gulch Creek, river mile 1.1	By 2010	Medium
				Steven's Ridge Culvert, Pataha Creek, river mile 43.8	By 2010	Medium
				Dry Pataha Dam, Dry Pataha Creek, river mile 0.4	By 2010	Medium

Table 6-5
Pataha Creek Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Regulatory Actions						
	PC9	Entire IA	Garfield County, WDFW, USFS	Update, implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.	Ongoing	Low
Miscellaneous Studies						
19	PC2.. PC7	Lower Pataha	Garfield County, Ecology	Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals to meet needs.	By 2007	Medium
20	PC4	Entire IA	WDFW and CD	Identify specific stream fords that could be eliminated by installing bridges or culverts.	By 2020	Medium
21	PC1	Garfield County	Ecology	Identify number of water users and amount of water involved with 1913 Garfield County Adjudication	By 2015	Low
22	PC12	Pomeroy	Garfield County	Review permitting and managed growth practices in lieu of future water needs, public health, and post-fire redevelopment activities (including identification of non-permitted diversions and discharges; permitted structures; growth management issues; water supply and public health issues)	By 2008	Low

Notes:
1) Schedule: Suggested dates have been provided or a range, where: Near-term=0-3 years; Mid-term=3-10 years; Long-term=10 years or more beyond date of plan adoption.
2) Estimated costs have been provided where available from feasibility or other studies. Otherwise, a cost range is provided where: Low=<$100,000; Medium=$100,000-$500,000; High= >$500,000

Exhibit 6-3: Management Actions for Pataha Creek Implementation Area

EXHIBIT UNDER DEVELOPMENT

6.4 Tucannon River Implementation Area Planning Objectives and Actions

The Tucannon River Implementation area is formed by the drainage from the Tucannon River mainstem. The Pataha Creek is the Tucannon River's major tributary, and is addressed as a separate implementation area. The mainstem drains 318 square miles, and enters the Snake River at RM 62.2. Most of the Tucannon River Implementation Area is within Columbia County, with a small portion in Garfield County. The area is also within the Nez Perce Tribe treaty territory. The Tucannon River Implementation Area is rural, with a 2000 population of approximately 1,459. Of these, approximately 165 live in the City of Starbuck, the area's only semi-urban area. Population is projected to remain relatively constant through 2020. Vegetation in the basin is characterized by grasslands and agricultural lands at lower elevations and forests at higher elevations. Agricultural lands are the major land use: cropland, forest, rangeland, pasture, and hay production account for more than 90 percent of the land within the area. Most of the basin (75%) is in private ownership, with most of the privately-held land in the lower portion of the basin. Non-agricultural water use is approximately 144 afy, with about 10 % (14.4 afy) estimated to come from surface water diversions. Agricultural water use is approximately 4,426 afy, used to irrigate 1,602 acres. Ground water supplies approximately 18% or about 797 afy of the agricultural water demand. Current base flow of the Tucannon River provides an adequate supply for most water uses, including aquatic habitat. However, increasing the base flow would enhance the value of the aquatic habitat.

Several aquatic habitat restoration and protection projects have already been implemented or are ongoing within this area, led by federal, state, tribal and local agencies and private organizations. These projects, described in the Tucannon Subbasin Plan, are focused on several key issues: upland issues, riparian restoration projects, instream projects, and CRP/CREP. Projects implemented within the Tucannon sub-basin have included:

- Dike removal/modification
- Direct seeding
- Erosion control (critical area planting, grassed waterways, conservation cover)
- Exclosures/fencing
- Fish screen installation
- Forest/riparian buffers
- Instream habitat construction
- Pond construction
- Establishment of permanent grasses/pastures/haylands
- Forest pest management
- Pipeline installation
- Reforestation/tree planting
- Sediment basin construction/repair/maintenance
- Spring development
- Woody debris addition

It is recommended that implementation of these and other habitat restoration projects continue.

Specific objectives for the Tucannon Implementation Area are provided below. These are in addition to the Basin-wide objectives and actions described in Section 5. For convenience, objectives are numbered sequentially with the prefix TR (Tucannon River). The numbers do not imply or assign any priority to the objectives.

TR1: Improve water delivery, reliability and efficiency of individual agricultural irrigation systems; and thereby improve instream flows in Tucannon River.

TR2: Continue instream flow and water quality monitoring through permanent and seasonal gauges to improve baseline data needed to evaluate instream flow enhancement efforts, and to regulate proposed New Appropriations Flow (minimum instream flow) on Tucannon River.

TR3: Set instream flow minimum and target flow for Tucannon River at Lower Tucannon River and Marengo gauge stations.

TR4: Develop additional water supply/rights from ground water to provide future needs of area (including replacing surface waters currently diverted for agricultural irrigation), assuming sufficient ground water is available to provide a sustainable supply.

TR5: Continue to reduce fecal coliform, temperature, pH and TSS levels, to the extent not limited by the natural hydrology, at the mouth of Tucannon River.

TR6: Continue to increase base flows in Tucannon River to enhance aquatic habitat.

TR8: Implement aquatic habitat restoration objectives/projects (Table 6-6) for the Tucannon River reaches including Pataha-Marengo, Marengo-Tumalum, *Tumalum-Hatchery*, *Hatchery-Little Tucannon* [designated priority projects in the Salmon Recovery Plan, after the 2005 School Fire], and the Mountain Tucannon (Tucannon River, Little Tucannon River to Bear Creek access limit)

TR9: Implement aquatic habitat protection objectives/projects (Table 6-6) for areas of high quality habitat including Tucannon River: (Pataha to Marengo; Marengo to Tumalum; Tumalum to Hatchery; Hatchery to Little Tucannon; “Mountain Tucannon”: Tucannon River, Little Tucannon River to Bear Creek access limit; Panjab Creek drainage; Cummings Creek drainage; Lower Tucannon River; Headwaters of the Tucannon River (includes Hixon Creek) including limited maintenance to reduce potential impacts from flooding.

TR10: Continue to restore areas of degraded riparian vegetation on private and public land through activities such as CREP/CRP and conservation easements participation with an early emphasis on the most degraded areas (Tucannon River from Pataha to Little Tucannon, and the Mountain Tucannon).

TR11: Continue to improve fish passage conditions through screening upgrades and the removal of fish passage barriers.

TR12: Conduct groundwater hydrology study to determine if additional withdrawal would be sufficient to meet current and future demand.

TR13: Conduct aquifer recharge projects to enhance instream flows and improve water quality.

TR14: Complete a water quality study for the Tucannon River.

TR15: Educate public landowners concerning BMP's.

TR16: Provide effective administration of "School Fire" restoration funds.

TR17: Protect critical and pristine area

TR18: Add new language that says something about changes in state water rights statutes water conservation programs.

Specific projects, actions and additional studies are identified in Table 6-7 organized by planning elements, to meet the area-specific objectives described above and basin-wide objectives provided in Section 5. Where specific projects for each planning element are not identified, refer to the basin-wide management strategies for more general actions on what is intended for a given planning element in the implementation area. Exhibit 6-4 identifies some areas of known water quality and/or aquatic habitat issues where management actions should be targeted.

Table 6-6

Desired Future Habitat Conditions for the Tucannon River Expressed in Percent Restoration of Historical Conditions (Draft SRSRP, 2005)

Geographic Area	Fine Sediment	Substrate Embeddedness	Turbidity	Pools	Pool Tailouts	Backwater Pools[a]	Carcass Loading[a]	Benthic Production[a]	Woody Debris	Riparian Function	Temperature Maximum	Bed Scour	Artificial Confinement
Mouth Tucannon[a]	11%	11%	11%	–	–	–	–	–	–	–	3%	–	–
Lower Tucannon[a]	11%	11%	11%	–	–	–	–	–	–	–	46%	–	–
Tucannon River, Pataha Creek to Marengo	56%	56%	56%	39%	39%	22%	9%	22%	43%	31%	100%	100%	9%
Tucannon River, Maregno to Tumalum Creek	–	–	–	38%	38%	–	–	–	–	–	63%	100%	9%
Tucannon River, Tumalum Creek to Hatchery	–	–	–	33%	36%	11%	5%	11%	23%	29%	40%	–	–
Tucannon River, Hatchery to Little Tucannon River	–	–	–	24%	24%	21%	8%	21%	42%	22%	–	–	20%
Mountain Tucannon	–	–	–	28%	28%	10%	8%	10%	20%	27%	–	–	20%

[a] LWD addition assumed to increase carcass retention, benthic production and area of backwater pools.

Table 6-7
Tucannon River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Water Quantity Management						
1	TR2	Tucannon River	USGS and Ecology	Implement instream flow monitoring through permanent and seasonal gauges on Tucannon River.	Ongoing	Low
2	TR12	Entire IA	Ecology, irrigators	Characterize ground water conditions to determine if additional withdrawals from ground water (up to 3629 afy) is sustainable	By 2010	High
3	TR13	Entire IA	Ecology, irrigators,	Replace surface water withdrawals for agricultural irrigation with ground water sources if study determines withdrawal is sustainable and practicable; source substitution could be implemented during low flow periods or permanently where feasible.	By 2015	High
4	TR12	Entire IA	Columbia County, Ecology	Conduct detailed hydrogeology study to understand basalt and alluvial ground water resources and identify sustainable levels of ground water withdrawals that could potentially replace surface water diversions.	By 2007	Med
5	TR13	Entire IA	Ecology, WDFW,	Identify wetland storage projects	By 2015	Med
6	TR17	Entire IA	Ecology, Conservation District	Explore opportunities for water right leases and/or acquisitions through the WDOE Trust Water Program and/or water banking.	By 2010	Low
Water Quality Management						
7	TR14	Tucannon River	CD, Ecology	Conduct a study to current condition and sources of water quality including: • Determining if the inputs of the Pataha River are impacting water quality in the Tucannon River. • Identifying sources of fecal coliform • Determining the natural	By 2010	Low

Table 6-7
Tucannon River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
				temperature ranges for the Tucannon River • Collecting data in accordance with Ecology standards for use in developing state-required TMDLs		
8	TR5	Tucannon River	Ecology, Columbia County	Implement the following strategies to reduce fecal coliform levels at mouth of Tucannon River: 1. septic system repair and/or upgrade 2. livestock BMPs 3. regulation of point sources 4. restore riparian buffers 5. manage grazing in riparian areas	By 2010	Low
9	TR5	Tucannon River Uplands	Ecology, Columbia County, individual landowners	Implement the following strategies to reduce TSS levels by reducing the sediment load entering the River: 1. conservation tillage 2. grassed waterways 3. sediment basins improve riparian function 5. reduce erosion from public and private roads (via maintenance or non-dirt materials)	By 2010	Low
10	TR5	Entire IA	CD, NRCS	Identify opportunities for funding for landowners to reduce sediment from private roads	By 2015	Low
11	TR15	Tucannon River	Ecology, Columbia County	Continue ongoing strategies to reduce water temperatures: 1. BMPs	By 2010	Medium
12	TR15	Entire IA	WSU Cooperative Extension, Ecology, WADOT	Work with individual landowners to review pesticide and fertilizer use; and to implement the following best management practices to limit water quality impacts: 1. non-chemical weed control practices (mowing, etc) of ditches and ROWs	Ongoing	Low

Table 6-7
Tucannon River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
				2. restore riparian areas 3. urban/rural education program 4. conservation tillage		
13	TR15	Entire IA	Columbia County, NRCS, WDFW, USFS, and WSU Coop Extension	Establish and promote the following BMPs for erosion control for pasture and rangeland, cropland, and forest land: 1. creation and maintenance of county ROW buffers 2. agricultural BMPs to buffer agricultural feeds next to roadways 3. conservation tillage 4. increase grassed waterways 5. buffers 6. strip cropping	Ongoing	Low
Aquatic Habitat Enhancement						
14	TR16	Fire Boundaries	WDFW, USFS	Prioritize funds for post-fire restoration (School Fire) on public lands	Ongoing	Med
15	TR8, TR9	Tucannon River reaches including Pataha-Marengo, Marengo-Tumalum, *Tumalum-Hatchery, Hatchery-Little Tucannon* [designated priority projects in the Salmon Recovery Plan, after the 2005 School Fire], and the Mountain Tucannon (Tucannon River, Little Tucannon River to Bear Creek access limit)	WDFW, USFS, CD, Tribes	Implement aquatic habitat protection and restoration plans; including the following priority projects: 1. Curl Lake Intake Improvement 2. Sediment reduction 3. Enhancement of habitat in riparian zones for Fall Chinook/Steelhead 4. Control of noxious weeds 5. Planting of native vegetation 6. Hartsock Creek Retention Pond 7. School Fire Riparian Recovery 8. Tucannon Steelhead Captive Brood Program 9. Tucannon Spring Chinook Hatchery Supplementation	Ongoing	Low-High

Table 6-7 Tucannon River Implementation Area Actions						
Action (non-prioritized)	**Supported Objectives**	**Location**	**Lead Agency**	**Description**	**Schedule [1]**	**Cost [2]**
16	TR10	Entire IA	WDFW and Conservation District	Restore areas of degraded riparian vegetation on private and public land through ongoing activities such as CREP and CRP participation and site-specific BMPs (e.g. placement of large woody debris, long-term recruitment from riparian planting, restricting livestock access, etc.) with an early emphasis on the most degraded areas.	By 2020	Medium
17	TR10	Entire IA	WDFW and Conservation District	Develop a pilot project to restore areas of degraded riparian vegetation on private and public land through conservation easements with an early emphasis on the most degraded areas and provide education/outreach on the potential use of easements as a watershed tool	By 2020	Medium
18	TR9	Entire IA	USFS, Columbia County	Work with public land and wildlife management agencies to maintain and enhance pristine and other areas of the headwaters, with specific focus on the post-School Fire recovery area, by applying BMPs.	Ongoing	Low
19	TR11	Entire IA	Ecology, WDFW, Conservation District, and City of Starbuck	Remove fish passage obstructions, including:	2007 to 2010	Low to Medium
				Tucannon River, Starbuck Dam (RM 5.5) [improve function of existing ladder]	2007	Medium
				Tucannon River, Irrigation Weir (RM 13.5)	2007	Medium
				Tucannon River, Hatchery Dam (RM 38.4)	2010	Medium
				Tucannon River, Curl Lake Weir (RM 43)	2010	Medium
20	TR3	Tucannon River, Marengo-Tumalum	WDFW and Conservation District	Continue to provide surface water diversions with effective fish screens and identify if additional screens are	2007	Medium

Table 6-7
Tucannon River Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
				needed with the subbasin		
Regulatory Actions						
21	TR3	Tucannon River	Ecology	Establish minimum instream flows for Tucannon River at Lower Tucannon River and Marengo gauge sites.	By 2007	Medium
22	TR17	Entire IA	Columbia County, WDFW, USFS	Implement/enforce federal, state and local land use regulations to protect critical areas and pristine areas of the implementation area.	Ongoing	Low
23	TR18	Entire IA	Planning Unit	Recommend to the state legislature to accommodate water spreading by existing water right holders	By 2010	Low
24	TR18	Entire IA	Planning Unit	Recommend to the state legislature to change water right statutes to allow maintenance of original appropriation date for surface water diversions that are transferred to ground water	By 2010	Low
Miscellaneous Studies						
25	TR8	Entire IA Tributaries to the Tucannon River	WDFW, Columbia County	Identify specific stream fords that could be eliminated by installing bridges or culverts. Pursue project funding.	By 2020	Medium

Exhibit 6-4: Management Actions for Tucannon River Implementation Area

EXHIBIT UNDER DEVELOPMENT

6.5 Grande Ronde Implementation Area Planning Objectives and Actions

The Grande Ronde subbasin encompasses an area of about 4,000 square miles primarily in northeast Oregon but also including 341 square miles of southeast Washington. The southeast portion of the subbasin within Washington is the implementation area for this plan, and includes portions of Asotin, Columbia, and Garfield counties. The Grande Ronde River flows generally northeast for 212 miles from its origin in Oregon to join the Snake River at river mile (RM) 169 near the city of Asotin, and is the largest waterbody in the IA.

The Grande Ronde is a rural area with no urban centers. Current population (2005) is estimated at approximately 137,364. The population is expected to remain relatively constant or decline slowly through 2025. Because there are no urban centers within the area, all of the water use in the Grande Ronde IA is assumed to be rural residential or agricultural.

Annual rural residential water use was estimated to be approximately 154 afy in 2005. Rural residential water rights account for roughly 13% of all water rights in the area. Agricultural water rights make up about 87% of all water rights in the Grande Ronde IA. Year 2005 actual agricultural demands are not known; however, they are believed to range from 875 to 1,250 afy and are used to irrigate approximately 300 acres. Based on water rights, it is estimated that 93% of all available water in the area comes from surface water diversions. Most surface water diversions are located on the Grande Ronde River mainstem and Joseph Creek, a tributary to the Grande Ronde River. These sources currently supply most water uses, including aquatic habitat. However, increased summer base flows would enhance habitat values for aquatic species.

Vegetation in the area may be generally characterized by forest at higher elevations and shrub-steppe or grassland at lower elevations. In general, 46% of landuse in the Grande Ronde IA is forest, 52% is shrub-steppe or grassland, and approximately 2% of landuse is devoted to agriculture.

Major watershed management issues within the IA are detailed in the WRIA 35 Level I Assessment (2005) and focus on three main areas:

- Inadequate water quality and water quantity baseline data
- Irrigation efficiency
- Aquatic habitat

Specific objectives that address the above major issues for the Grande Ronde Implementation Area are provided below. These are in addition to the Basin-wide objectives and actions described in Section 5. For convenience, objectives are numbered sequentially with the prefix GR (Grande Ronde). The numbers do not imply or assign any priority to the objectives.

GR1: Continue to measure, record, and report annual agricultural water use as per Chapter 90.03 RCW by installing water meters for all agricultural water users (surface and groundwater diversions) (Grande Ronde Level I 2005).

GR2: Improve irrigation efficiency by:

- Replacing low efficiency hand and wheel lines
- Change irrigation timing or use of storage to augment water supply during dry summer months

GR3: Continue current instream flow monitoring and water quality monitoring efforts through permanent and seasonal gauges to improve baseline data needed to evaluate instream flow enhancement efforts and facilitate future water management.

GR 4: Reduce high instream temperatures in the lower Grande Ronde mainstem and tributaries.

GR5: Identify and develop aquatic habitat protection strategies for areas of existing high quality habitat.

GR6: Implement aquatic habitat restoration objectives/projects for the lower Grande Ronde mainstem and tributary reaches that address the following prioritized objectives (Grande Ronde Subbasin Plan 2004):

- Fish passage: Identify, prioritize, and modify barriers to fish passage
- Low flows: Enhance existing hydrograph to match the natural hydrograph to the extent possible in the lower Grande Ronde mainstem and tributaries.
- Channel conditions (including instream habitat): Improve and enhance channel and instream habitat conditions to a historic state to the extent possible
- Riparian conditions: Achieve the size, structure, and distribution of riparian vegetation that is appropriate for the ecoregion. Restore areas of degraded riparian vegetation through activities such as CREP and conservation easements with an emphasis on the most degraded areas.

GR7: Set minimum instream flows and target flows for the Grande Ronde mainstem and significant tributaries within Washington.

GR8: Increase the amount of available data and periods of record pertaining to the Washington portion of the Grande Ronde subbasin in the areas of:

- Water quality
- Water quantity
- Land use (Grande Ronde Level I 2005)

GR9: Improve water quality in the Grande Ronde River and tributaries.

Specific projects, actions, and additional necessary studies are identified in Table 6-8. They are organized by planning element to meet the area-specific objectives described above, as well as the basin-wide objectives provided in Section 5. Where specific projects for each planning element are not identified, refer to the basin-wide management strategies for more general actions on what is intended for a given planning element in the implementation area. Exhibit 6-5

identifies some areas of known water quality and/or aquatic habitat issues where management actions should be targeted.

Table 6-8
Grande Ronde Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
Water Quantity Management						
1	GR3	Rattlesnake Creek Cottonwood Creek Cougar Creek Menatchee Creek Crooked Creek Butte Creek North Fork Wenaha River	USFS, Ecology	Installation of additional instream flow gauges with focus on perennial streams with potential fish habitat.	By 2010	Low
2	GR8	USGS 13334000 USGS 13333000 Ecology 35G060	USFS, Ecology	Continued instream flow monitoring at seasonal and permanent gauging locations.	By 2010	Low
3	GR3	Area-wide	USFS, WDFW	Modify surface water diversions to meet NOAA fish passage standards where necessary	By 2015	Med
4	GR1	Area-wide	Ecology	Continue installing water use meters to surface water and groundwater diversions	Ongoing	Low
5	GR2	Grande Ronde mainstem Joseph Creek	Irrigators	Ensure adequate water supply for irrigation by: 1. Upgrading low efficiency systems 2. Changes in irrigation timing 3. Storage for periods of low availability	Ongoing	Med
Water Quality Management						
6	GR8	Rattlesnake Creek Cottonwood Creek Cougar Creek Menatchee Creek Crooked Creek Butte Creek North Fork Wenaha River Joseph Creek Lower Grande Ronde River	USFS, Ecology	Implement a regular water quality monitoring program that will identify contributions to high instream temperatures, fecal coliform and sediment delivery from tributaries	By 2010	Low
7	GR3	USGS 13334000 Ecology 35C070	USGS, Ecology	Continued water quality monitoring at existing locations.	Ongoing	Low
8	GR6	Rattlesnake Creek Cottonwood Creek Cougar Creek Menatchee Creek	Federal Land Managers	Implement the following actions to reduce suspended sediments from tributary streams: 1. no till 2. increase grassed waterways	By 2010	Low

Table 6-8
Grande Ronde Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
		Crooked Creek Butte Creek North Fork Wenaha River Joseph Creek Lower Grande Ronde River		3. buffers 4. strip cropping		
9	GR9	Grande Ronde River	Landowners, Ecology	Implement the following actions to reduce fecal coliform levels on the Grande Ronde: 1. manure management 2. riparian enhancement 3. improve/encourage grazing management for operations adjacent to streams 4. septic system inventory / management/straight pipes 5. reduce or eliminate combined sewage overflows 6. urban sources 7. inventory / dye testing of septic systems adjacent to floodplains and waterways 8. other applicable BMPs	By 2015	Low
Aquatic Habitat Enhancement						
10	GR9 GR4	Rattlesnake Creek Cottonwood Creek Cougar Creek Menatchee Creek Crooked Creek Butte Creek North Fork Wenaha River Joseph Creek Lower Grande Ronde River	Landowners, Ecology	Implement actions to reduce instream temperatures within Grande Ronde mainstem and tributaries	By 2015	Low
11	GR6, GR5	Area-wide	WDFW, USFWS	Develop aquatic habitat restoration and protection plans; including the following prioritized projects 1. Bull trout monitoring 2. Grande Ronde Supplementation Program Monitoring and Evaluation 3. Life Studies of Spring Chinook	Ongoing	High

Table 6-8
Grande Ronde Implementation Area Actions

Action (non-prioritized)	Supported Objectives	Location	Lead Agency	Description	Schedule [1]	Cost [2]
12	GR6	Entire IA	CD	Restore areas of degraded riparian area through CREP or permanent conservation easements	By 2010	Med
13	GR6	Entire IA	WDFW	Address barriers to fish passage such as; 1. Improperly screened diversions 2. Inadequate culvert modifications	By 2010	Low
14	GR6	Entire IA	CD	Improve degraded channel conditions where necessary	By 2015	Low
Regulatory Actions						
15	GR7	Rattlesnake Creek Cottonwood Creek Cougar Creek Menatchee Creek Crooked Creek Butte Creek North Fork Wenaha River Joseph Creek Lower Grande Ronde River	Planning Unit, Ecology	Establish minimum instream flows	By 2010	Low
Miscellaneous Studies						
16	GR8	Grande Ronde mainstem and tributary riparian zones	Planning Unit	Develop a more complete knowledge of land uses that impact water quality, water quantity, and aquatic habitat	By 2015	Low

Exhibit 6-5: Management Actions for Grande Ronde River Implementation Area

EXHIBIT UNDER DEVELOPMENT

Section 7
Plan Implementation Considerations

7.1 Introduction

This plan identifies a range of recommended basin-wide and implementation area-specific actions concerning water supply, stream flow management, surface water quality, groundwater quality, and aquatic habitat. This section addresses overall implementation needs necessary for providing a solid foundation for individual actions. Implementation considerations for these actions include identifying the organizations that would have implementation responsibilities, implementation timeframe, cost of implementation, and potential sources of funding. This section also builds on information and recommendations presented in a Report to the Legislature prepared by the Phase 4 Watershed Plan Implementation Committee in 2002. These recommendations have been reshaped to match local circumstances in the WRIA 32.

7.2 Plan Adoption Process and Resulting Obligations

The Watershed Management Act prescribes a specific process for adoption of a watershed plan, and voluntary acceptance of obligations under the plan (Section 90.82.130 RCW). This is a two-stage process. First, the Planning Unit considers the plan for approval, and individual members of the Planning Unit consider what actions they will commit to carrying out. Once this is completed, the plan is sent to the Boards of County Commissioners of Asotin, Columbia, Garfield and Whitman Counties for their consideration. If the Commissioners approve the plan, the voluntary commitments made by members of the Planning Unit become binding, recognizing funding and staffing limitations (see discussion below).

Through this process, no organization or person is required to take on a commitment outlined in the plan. However, once an organization has formally agreed to implement actions identified in the plan, the Planning Unit expects these commitments to be honored; recognizing funding limitations. The Planning Unit requests all state and local government agencies to consider and accept all applicable obligations through taking action on a template MOA to be developed during Phase IV – implementation.

This watershed plan does not create any obligations for private businesses, citizens or landowners. However, there are actions identified for *voluntary* action in the private sector.

Actions recommended in this plan are intended to be specific enough to clearly identify the actions and results; yet general enough to permit some flexibility in carrying them out. The Planning Unit recognizes that some actions require further investigation prior to full implementation. The Planning Unit also recognizes that some actions can be carried out only if funding is provided by the State Legislature or other funding agencies, and that funding decisions will be made over a period of months or years following plan adoption. The recommendations made in this plan have been crafted to recognize these limitations.

It will be important that any rules adopted by the State of Washington to implement this watershed plan remain consistent with the intent expressed by the Planning Unit in this watershed plan. The strategies presented in this watershed plan are intended to provide a balanced suite of actions to manage water resources in the WRIA 35 planning area. In the event that a State rule-making process, legislative action, or court decision substantially alters implementation of the provisions outlined in the plan, the other organizations with implementation responsibilities reserve the right to re-visit their implementation commitments in light of these changed conditions. If changes in commitments are being considered that would substantially alter the plan strategies and actions, then these changes would go through a watershed plan amendment process to update the plan to reflect changed conditions or new information, depending upon available funding. This is particularly true for County governments, which have the role of adopting the plan through the approval process under Chapter 90.82.130 RCW.

7.3 Grant Funding for Implementation Phase

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

As an example of grant funding, the WRIA 35 Planning Unit is eligible for up to $100,000 per year in each of the first three years of implementation. Following this, $50,000 per year can be awarded in the fourth and fifth years of implementation. A match of ten percent is required, which can include either financial contributions or in-kind goods and services.

It is not expected that this limited amount of funding will cover implementation of the projects and programs discussed in this watershed plan. Instead, these funds should be considered “seed money” to strengthen the organizational foundation for plan implementation and to pursue more substantial funding for the many activities recommended in this plan.

The Legislature also provided that the Planning Unit must complete a detailed implementation plan within one year of accepting the Phase 4 funding. Disbursements of Phase 4 funding for subsequent years is conditioned upon completion of the implementation plan. The implementation plan must contain strategies, timelines and milestones; define coordination and oversight responsibilities, any needed interlocal agreements, rules or ordinances; any needed state or local administrative approvals and permits, and specific funding mechanisms. In addition, the Planning Unit must consult with other organizations developing plans in the same area, and identify and seek to eliminate activities or policies that are duplicative or inconsistent.

The Planning Unit anticipates applying for the Phase 4 grant funding at such time as this watershed plan is approved. The discussion of implementation considerations in the plan provides a starting point for eventual development of the detailed implementation plan described above.

The Planning Unit anticipates that full implementation of plan recommendations will require a time frame on the order of five to twenty years. Many actions can be carried out in the first five

to ten years; while others will require more time to obtain funding, permits, and other necessary approvals. As noted above, the current grant funding program is designed only for the first five years of this time frame.

7.4 Overall Coordination of Plan Implementation

The recommendations presented in this watershed plan span a range of natural resources, activities, and organizations. Recommendations are identified for county governments, public water systems, several state agencies, private industry, landowners and others.

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

- Tracking implementation of plan actions by the many organizations involved to ensure actions are being carried out in a timely fashion, that the balanced nature of the plan is retained as actions are implemented, and that the most important priorities defined by the Planning Unit are being addressed.
- Coordinating efforts to seek funding for plan actions to avoid duplication of effort and ensure the State legislature and funding agencies see well-organized and unified support for funding requests on an ongoing basis.
- Providing information to the public on plan implementation and resulting improvements in watershed conditions.
- Providing early warning systems and joint responses to changing conditions, including physical conditions in the watershed, new regulatory developments, and new project proposals that may emerge from time to time.
- Monitoring of watershed conditions across jurisdictional boundaries, data management, and providing data access.
- Periodic review of the plan, and updating the plan if warranted.
- Other consideration and oversight activities will be added as necessary.
- In order to provide a venue for these activities, it is recommended that the Middle Snake Planning Unit transition from planning functions to coordination and oversight functions as listed above. The purpose is to foster an organized and collaborative approach as many individual organizations carry out specific actions under their jurisdictions, and to secure funding for implementation. The Watershed Planning Director, hired in April 2006, would play a key role in coordinating the transition and assisting the Planning Unit in activities related to plan implementation.

The Planning Unit is encouraged to establish an Implementation Working Group (IWG) as a subcommittee to the larger Planning Unit. The purpose of the IWG is to coordinate implementation of the watershed plan along with the subbasin and Snake River salmon recovery plan as part of an integrated implementation approach. The IWG could assume the following activities:

- Outline a schedule of restoration planning and implementation activities for the next two years;
- Identify associated funding needs for these projects;

- Identify roles and responsibilities for securing additional funds needed to implement the two-year plan, and which organization(s) are responsible for implementing these projects; and
- Identify opportunities for coordination and collaboration among basin organizations and individuals.

Project funding requests that will be submitted to the Washington State Salmon Recovery Funding Board will need to go through a regional review and prioritization process led by the Snake River Regional Recovery Board. Under this process, project proponents propose projects that will go through a Planning Unit review committee (assumed IWG) and the Snake River regional review process before being submitted to the State for funding consideration.

More details on IWG responsibilities will be developed during Phase 4.

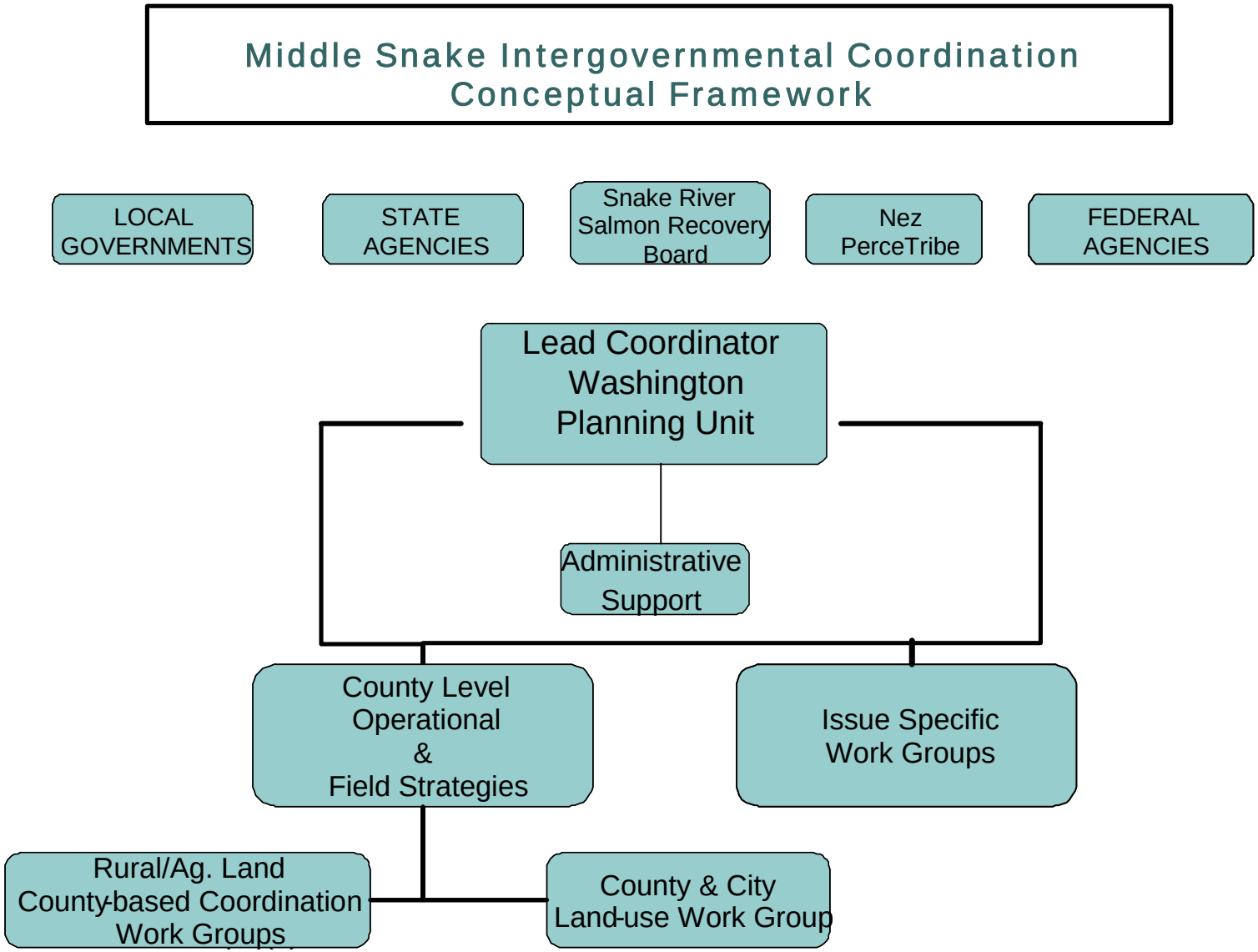
To support the Planning Unit and its subcommittees, such as the IWG, during implementation, the Watershed Director and Initiating Governments are encouraged to develop a strategy that would allocate funding to provide staff resources, including the continued financial support of the Watershed Director position, to assist the Planning Unit in this activity. Funding could be based on the State Phase 4 grants for the first five years of the implementation phase, or other funding sources. This and other roles and responsibilities will need to be worked out during early plan implementation.

The Planning Unit requests all state and local government agencies to consider and voluntarily accept all applicable obligations through taking action on a template MOA to be developed during Phase IV – implementation. Such an agreement will be beneficial in further defining other implementation commitments among the organizations involved, beyond the level of detail presented in this plan.

The Planning Unit will not take on any regulatory responsibilities or authorities. Regulatory activity will continue to be the responsibility of state or federal agencies and local governments, consistent with existing laws.

For the Planning Unit to be effective in the coordination and oversight role, local jurisdictions such as Asotin, Columbia, Garfield and Whitman Counties, cities and conservation districts will need to make staff resources available. Other groups such as the Nez Perce Tribe, Tri-State Steelheaders, Washington Wheatgrower's Association, Blue Mountain Land Trust should also participate, and coordination should continue with the Snake River Salmon Recovery Board. Exhibit 7-1 identifies a conceptual coordination approach. This coordination approach will be refined during the development of the implementation plan (Phase IV of watershed planning).

Exhibit 7-1


Middle Snake Intergovernmental Coordination
Conceptual Framework
LOCAL GOVERNMENTS
STATE AGENCIES
Snake River Salmon Recovery Board
Nez PerceTribe
FEDERAL AGENCIES
Lead Coordinator Washington Planning Unit
Administrative Support
County Level Operational & Field Strategies
Issue Specific Work Groups
Rural/Ag. Land County-based Coordination Work Groups
County & City Land-use Work Group

7.4.1 Detailed Implementation Planning

Washington State watershed planning (RCW 90.82) and salmon recovery planning include the development of Detailed Implementation Plans (DIP). A coordinated regional-watershed DIP has previously been prepared for WRIA 32 (Walla Walla Basin) and the Snake River Salmon Recovery Planning Area, with the intent that WRIA 35 will be incorporated into this process upon adoption of the Middle Snake Watershed Plan. See Exhibit 7-2 for regional planning boundaries.

Implementation of actions, programs and management activities identified in this watershed plan occurs on both a regional and watershed level. Rather than develop individual plans for each WRIA and for the region, a combined plan and regional implementation framework better serve the needs of the Snake River region and the individual watersheds. The DIP provides a framework for how to implement projects, programs, monitoring and assessment for water quantity, instream flow, and water quality, aquatic habitat enhancement and protection across the region and within the WRIA 35 watershed. The DIP addresses specific requirements for watershed and salmon recovery planning.

Within one year of receiving funding for watershed implementation, each WRIA is required to complete a detailed implementation plan (DIP) in order to receive grants for the second, three and fourth years of the grant.
Per RCW 90.82.043, the DIP must:

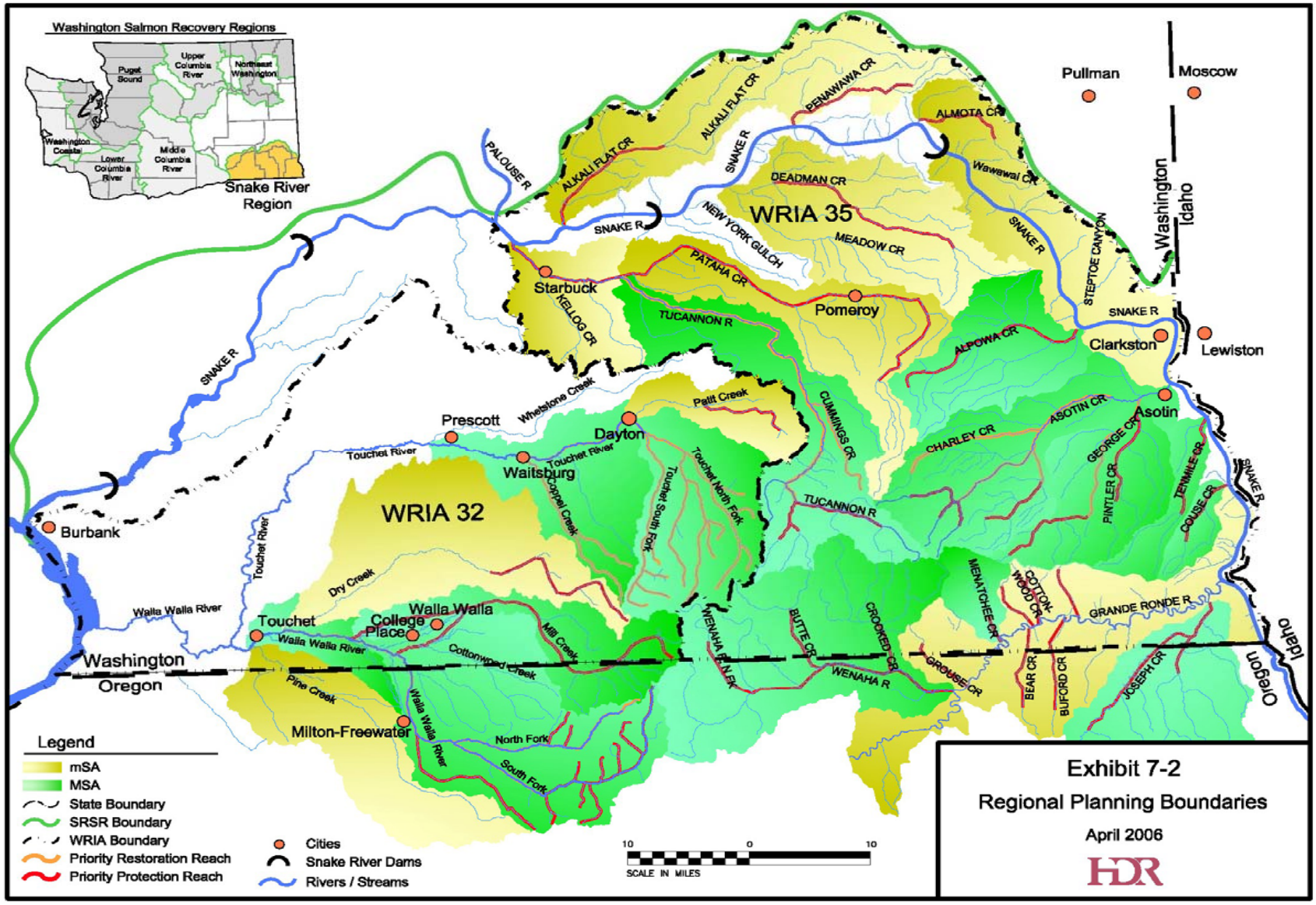
- Contain strategies to provide sufficient water for: (a) production agriculture; (b)
- commercial, industrial, and residential use; and (c) instream flows;
- Timelines to achieve strategies and milestones to measure progress;
- Define coordination and oversight;
- Describe any needed interlocal agreements, rules or ordinances;
- Describe any needed state or local administrative approvals and permits that must be
- secured; and
- Describe specific funding mechanisms.

In addition, the Planning unit must consult with other watershed planning entities to reduce duplication and ensure consistency. This is one of the reasons why the WRIA 35 DIP will be combined with the WRIA 32 and SRSRP implementation plans.

Per RCW 90.82.048, the DIP also “must address the planned future use of existing water rights for municipal water supply purposes, as defined in RCW 90.03.015, that are inchoate, including how these rights will be used to meet the projected future needs identified in the watershed plan, and how the use of these rights will be addressed when implementing instream flow strategies identified in the watershed plan.” Table 7-1 provides a list of Group A water systems within WRIA 35 that will be involved in the municipal water supply planning effort during development of the DIP.

Table 7-1

System Name	County	OwnerTypeDesc	ResConn	TotalConn	PWSAddress1	PWSCity	WSState	WSZipCode
FIELD SPRINGS STATE PARK	ASOTIN	State	2	12	922 PARK RD	ANATONE	WA	99401
ASOTIN WATER DEPT	ASOTIN	City/Town	520	544	PO BOX 517	ASOTIN	WA	99402
GRAND RONDE RANCHES #1	ASOTIN	Private	15	15	38199 SNAKE RIVER RD	ASOTIN	WA	99402-9512
CHIEF TIMOTHY PARK	ASOTIN	Federal	1	49	13766 HWY 12	CLARKSTON	WA	99403
PUD #1 OF ASOTIN COUNTY	ASOTIN	Special District	6260	6,260	PO BOX 605	CLARKSTON	WA	99403
LAST RESORT WATER SYSTEM	COLUMBIA	Investor	1	37	2005 TUCANNON RD	POMEROY	WA	99347
CAMP WOOTEN STATE PARK	COLUMBIA	State	1	22	2711 TUCANNON RD	POMEROY	WA	99347
STARBUCK, CITY OF	COLUMBIA	City/Town	88	88	PO BOX 276	STARBUCK	WA	99359-0276
LYONS FERRY MARINA	COLUMBIA	Private	1	5	PO BOX 189	STARBUCK	WA	99359-0189
ALPOWA SUMMIT REST AREA	GARFIELD	State	0	2	1501 BRIDGE ST.	CLARKSTON	WA	99403
POMEROY, CITY OF	GARFIELD	City/Town	738	739	PO BOX 370	POMEROY	WA	99347
GARFIELD COUNTY FAIRGROUNDS	GARFIELD	County	0	6	PO BOX 370	POMEROY	WA	99347
LOWER GRANITE LOCK & DAM	GARFIELD	Federal	0	1	885 ALMOTA FERRY RD	POMEROY	WA	99347-9632
BAKERS POND WATER USERS CORP	GARFIELD	Private	3	42	PO BOX 771	POMEROY	WA	99347
VAN VOGT WATER SYSTEM	GARFIELD	Private	1	2	10 MUNICH RD	POMEROY	WA	99347
DYE SEED RANCH 1	GARFIELD	Private	0	1	PO BOX 610	POMEROY	WA	99347
CENTRAL FERRY PARK	WHITMAN	Federal	3	84	13766 HWY 12	CLARKSTON	WA	99403
WAWAWAI COUNTY PARK	WHITMAN	County	1	6	N 310 MAIN	COLFAX	WA	99111


Washington Salmon Recovery Regions
Puget Sound
Upper Columbia River
Northeast Washington
Washington Coastal
Lower Columbia River
Middle Columbia River
Snake River Region
WRIA 35
WRIA 32
Pullman
Moscow
Washington
Idaho
Oregon
Starbuck
Pomeroy
Clarkston
Lewiston
Asotin
Prescott
Dayton
Waitsburg
Burbank
Touchet
College Place
Walla Walla
Milton-Freewater
SNAKE R
PALOUSE R
ALKALI FLAT CR
PENAWAWA CR
ALMOTA CR
Wawawai CR
DEADMAN CR
NEW YORK GULCH
MEADOW CR
PATAHA CR
KELLOG CR
TUCANNON R
STEPTOE CANYON
ALPOWA CR
Whetstone Creek
Patit Creek
CUMMINGS CR
ASOTIN CR
CHARLEY CR
GEORGE CR
PINTLER CR
TENMILE CR
COUSE CR
Touchet River
Coppei Creek
Touchet South Fork
Touchet North Fork
Dry Creek
Walla Walla River
Mill Creek
Cottonwood Creek
Pine Creek
North Fork
South Fork
MENATCHEE CR
COTTONWOOD CR
GRANDE RONDE R
BUTTE CR
CROOKED CR
WENAHA R
WENAHA R N FK
GROUSE CR
BEAR CR
BUFORD CR
JOSEPH CR
Legend
mSA
MSA
State Boundary
SRSR Boundary
WRIA Boundary
Priority Restoration Reach
Priority Protection Reach
Cities
Snake River Dams
Rivers / Streams
10 0 10
SCALE IN MILES
Exhibit 7-2
Regional Planning Boundaries
April 2006
HDR

Many of the elements and requirements cited above will be addressed in individual sections of the DIP. To avoid duplication of information, some elements or requirements will be demonstrated as being met by referencing sections of the watershed plan and/or SRSRP.

The DIP will include information on the implementation approach and framework, including:

- Regional Coordination – This section will discuss SRSRB structure, responsibilities, and project support, as well as how the Board will coordinate on a regional level, and with the lead entity program, regional technical team, watershed-level planning efforts, other agencies, and with the public.
- WRIA 35 Watershed Coordination – This section discusses the role of the Planning Unit in coordinating with regional and other local watershed efforts, individual organization responsibilities, funding strategies, incorporation of monitoring and adaptive management in plan implementation, public involvement and how the plan will be maintained and updated.
- Implementation Funding Sources and Prioritization Approaches. Included will be a template that outlines application processes, screening criteria and deadline dates for various funding mechanisms.
- Regional Priorities - The regional priorities includes a list of prioritized projects and other activities for years 1-5 for major spawning areas (MSA) and minor spawning areas (mSA) and non-prioritized projects for years 6-20.
- WRIA 35 Watershed priorities – The projects and activities that will be prioritized by the Planning Unit for the watershed are presented for years 1-5, while non-prioritized projects and activities are listed for years 6-20.
- Planned Future Water Use per RCW 90.82.043, and 048.

The Planning Unit can address other implementation topics in the DIP, if desired.

7.5 Implementation Actions by Individual Organizations

The involvement of individual organizations in carrying out their commitments is vital to this plan. The Planning Unit has no independent capability to implement plan actions. It is the counties, cities, conservation districts, water purveyors, Nez Perce Tribe, and State agencies, among others, that will ultimately carry out plan elements. Therefore, it is critical that their management and governing elected bodies take note of responsibilities recommended by the Planning Unit. Also, it is important to recognize that the mix of actions in this plan results in a sharing of commitments. This will help to spread the burden of carrying out plan actions, and will also deliver real benefits across the region's jurisdictions.

Specific actions have been identified in Section 6 of the watershed plan. Detailed implementation plans for completing these actions will be developed in Phase 4 – Implementation. Section 6 also contains recommended actions for each implementation area, and also identifies recommended responsible agencies. These assigned actions were based on Planning Unit understanding of existing roles and responsibilities for the various federal, state and local agencies, tribal government, and other organizations that will be participating in plan implementation. There may be some cases, where additional discussion may be needed to

determine lead and supporting organizations responsible for recommended actions. These discussions will occur during plan implementation.

For each organization carrying out actions under the plan, several steps will be needed. First, it is critical that elected decision-makers and top managers of the organizations understand the recommended actions they have been assigned to implement. Second, after the plan is adopted by the Counties, organizations will need to begin budgeting annually for actions and/or identify and pursue targeted funding sources for actions that cannot be funded through existing sources. This should be incorporated in each organization's budget process each year (or biennium for State agencies). Third, it is important to identify staff that will be responsible for carrying out specific actions. Finally, depending on the action and how the organization operates, there may be a need for work plans to be prepared to define actions and schedule. Coordination with the Planning Unit should occur regarding funding or staffing issues that arise during implementation, and coordinated funding strategies developed to secure funding to implement priority actions.

Budgeting of actions, identification of funding sources and implementation of actions has occurred throughout the planning process. This will also continue after plan adoption, as the plan is implemented over time. Plan adoption is not contingent upon secure funding. See Section 7.2 for funding caveats on recommended actions. It is recognized that actions cannot be implemented without commensurate funding. Also, the Planning Unit requests each organization consider its recommended role(s) and responsibilities, and sign the template MOA referenced in Section 7.2 accepting these, and also generally describe capacity and intent to carry out these actions.

7.6 Funding Strategy

Tables have been presented in earlier sections of this watershed plan that summarize implementation considerations[1]. These tables include a preliminary estimate of the magnitude of costs and suggested time frame. A mix of potential funding sources has been identified for different activities in the plan. These sources include:

- Appropriations from the Washington State Legislature for state agency budgets (Ecology, WDFW, DOH, DNR, and Conservation Districts). This would provide funding and/or staffing that could be utilized under existing state programs to implement elements of the plan.
- Direct appropriations from the Washington State Legislature for specific projects in the Walla Walla basin, based on requests to be formulated as the plan is implemented;
- Appropriations from the U.S. Congress for federal agency budgets (ACOE, NRCS, USGS, USFS) under existing programs;
- Grants or low interest loans from existing funding programs, such as the Public Works Trust Fund, the salmon recovery funds (state and federal), the State Revolving Fund for drinking water and many other sources may be used for funding management actions. A more detailed listing of grant and loan programs and descriptions of the types of watershed management actions will be developed in the detailed Implementation Plan.

[1] Tables listing implementation considerations for specific actions appear in Section 6.

- Rates and hookup charges collected from customers by public water systems (including cities that operate a water system, CPU, etc.)
- County permitting fees or general fund revenues;
- Assessments on property through local improvement districts, for projects that benefit those properties (subject to local approval);
- Private industry funds, for voluntary projects at selected industrial facilities (supplemented by public funds where possible); and
- Landowners, for voluntary projects at selected sites (supplemented by public funds where possible).

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

Many agencies and jurisdictions are currently funding programs that align closely with the objectives and recommendations of this plan. In many cases, existing expenditures can be effectively integrated with this plan, reducing the overall financial impact.

In developing a funding package for implementing the plan, it is important to match funding to benefits. Some of the actions listed in the plan, such as development of new groundwater supplies, will benefit a specific community. In these cases, it is appropriate that the specific community contribute a proportionate share of the cost.

Other actions may be carried out by one community, but the purpose is to serve broader needs (i.e., national, regional, tribal needs). For example, if a local community voluntarily wishes to switch from an existing source of supply to an alternate source (e.g., ASR well) to help restore populations of listed species, there will likely be considerable costs. The purpose of a project of this nature is to restore fish populations for the good of the region, the State of Washington and the Nation as a whole. In this case, it is not equitable for a local community to bear the entire project cost. While some cost burden may be acceptable at the local level, the majority of funding for this type of project should come from regional, state or federal sources.

7.7 Monitoring and Adaptive Management

Implementing an adaptive management program for the watershed plan is an important part of plan implementation. Adaptive management has been defined in State law as “reliance on scientific methods to test the results of actions taken so that the management and related policy can be changed promptly and appropriately” (RCW 79.09.020). Adaptive management is a continuing attempt to reduce the risk arising from the uncertainty associated with information used to develop the management actions.

Three general components of an adaptive management program include validation, implementation and effectiveness monitoring,

7.7.1 Validation Monitoring

Validation monitoring determines whether the assumptions used to develop the plan recommendations are valid. Many of the general recommendations were developed based on certain assumptions about population trends, land use trends, and flow information, among other information. The recommendations may need to be changed if it is determined that some of these assumptions are not valid.

7.7.2 Implementation Monitoring

Implementation monitoring involves tracking whether the recommendations and commitments adopted in the watershed plan are being implemented and whether or not these activities have been properly completed (i.e., yes or no). Implementation monitoring generally involves measures whose results or benefits are fairly certain and do not require complex study designs, e.g., confirmation of whether a flow monitoring gauge has been installed at the proper location.

7.7.3 Effectiveness Monitoring

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

7.7.4 Adaptive Management Implementation Considerations

General recommendations to consider during plan implementation include:

- Build upon existing monitoring efforts and use the Technical Work Group or other group as a coordinating body to fill data gaps;
- Adopt monitoring protocols to provide a consistent means for comparing information across geographical and temporal scales;
- Continue efforts to develop the basin-wide database with a universal interface from which to share the database, and share data; and
- Conduct all three types of monitoring (implementation, effectiveness, and validation).

7.8 Public Involvement for Plan Implementation

As the watershed plan is implemented, continued stakeholder involvement and public communications, like those that have occurred during plan development, will be necessary to

provide final shaping, support and effective execution of recommended management strategies and actions.

7.8.1 Public Participation and Ongoing Education

The WRIA 35 Planning Unit established a Public Involvement/Outreach Subcommittee to direct the public involvement process. The purpose of this work is to help the WRIA 35 Planning Unit identify issues of concern in each sub-basin of the Middle Snake Watershed and to integrate public perception of watershed issues into the early stages of watershed assessment and plan development. Public involvement was sought through direct participation in the Planning Unit and/or one of its subcommittees and through participation in one or more of a series of outreach workshops. Information on ongoing assessments and plan development was made available to the public through the Asotin PUD web site (www.asotinpud.org) and notices in local newspapers.

From May 21 – 28th, 2004, individuals interested in the health of the Middle Snake Watershed (WRIA 35) gathered in public workshops to discuss issues that impact the health of the watershed. Workshops were held in the Tucannon Subbasin (May 21), Pataha & Lower Snake Subbasins (May 22), Asotin Subbasin (May 27), the Lower Snake (Whitman County) Subbasin (May 28), and with the Nez Perce Tribe (May 28). Although sponsored under WRIA 35 watershed planning (2514), the workshops addressed relevant issues for the three primary planning processes in the basin: watershed planning, subbasin planning, and salmon recovery planning. Coordination between these three planning processes is vital for efficiency and to ensure consistency among the plans and their objectives.

The purpose of these workshops was three-fold: 1) to introduce watershed planning, salmon recovery planning, and subbasin planning efforts and report on their current status; 2) to develop a list of specific concerns in the watershed related to low flows, instream habitat, riparian vegetation, upland management, water supply, water quality, and other issues and identify where those issues are of primary concern; and 3) to initiate a continuing dialogue between the various stakeholders in the watershed. Benefits that were realized across all sub-basins included enhanced education and involvement of local stakeholders, development of an information foundation for Phase 2 watershed planning, improved communication/understanding between Nez Perce staff and local resource managers, and input for subbasin planning and salmon recovery planning goals, objectives and potential strategies.

A second series of workshops was held in September of 2005. They were focused on seeking additional public input on objectives and recommended basin-wide and management area-specific action plans. This was accomplished by conducting workshops in each management area. Breaking up WRIA 35 into smaller areas gave the opportunity for focused outreach efforts with local stakeholders in each management area.

Benefits that were realized across all subbasins included enhanced education and involvement of local stakeholders, development of an information foundation for Phase 2 watershed planning, improved communication/understanding between Nez Perce staff and local resource managers,

and input for subbasin planning and salmon recovery planning goals, objectives and potential strategies.

Other efforts of the Subcommittee included:

- Coordination and facilitation of public meetings to collect SEPA scoping comments and public input on planning objectives.
- Creation of a watershed planning website located on-line at http://www.asotinpud.org, with a schedule of meetings (agendas and meeting minutes), information on watershed planning, and links to reports, maps and planning products.
- Presentations to inform and update local governments, citizens and out-of-basin interests.

These and other measures should be continued to maintain and enhance stakeholder support for the plan during implementation. Outreach activities should be sustained during plan implementation by a coordinated group of knowledgeable, committed individuals.

Additional examples of useful outreach tools and activities that may be considered during implementation include:

- Facilitation of an email information distribution list to communicate periodic status reports or provide notification on forums dealing with specific issues;
- Hosting public conferences or forums, targeting both technical and non-technical audiences, to facilitate discussion among stakeholders and communicate watershed plan issues and successes; and
- Production of television and radio Public Service Announcements (PSAs).
- Development and distribution of watershed newsletters to advertise participation opportunities, provide updates on implementation efforts, and highlight the success in the watershed.
- Distributing information and educational materials, such as brochures, through a portable information booth at public events (County Fairs, community events, etc).

Communication efforts should continue to target stakeholders with implementation responsibilities and others whose water practices may be impacted, but also include a broader range of citizen groups with vested interests in the planning area and process. Information conveyed to the public may include: management strategy needs and priorities; status of plan implementation and associated performance measures; successful management actions and projects; innovative water management BMPs; and/or a summation of on-going monitoring programs. These outreach efforts should be closely coordinated with established communication efforts, such as Conservation Districts and Washington State University's Cooperative Extension programs in both counties.

Involving stakeholders in the basin is the key to executing management strategies and actions. Examples of organizations to contact in targeted outreach efforts during implementation include:

- County Conservation Districts and Farm Bureaus;

- Snake River Salmon Recovery Region Lead Entity (HB2496);
- Washington State University Cooperative Extension;
- Nez Perce Tribe;
- Confederated Tribes of the Umatilla Indian Reservation;
- Agricultural commodity groups and trade associations;
- Environmental organizations (Blue Mountain Land Trust, American Rivers, etc) and civic organizations;
- County Commissions and City Councils;
- Tri-State Steelheaders, Asotin County Sportsman and other hunting, fishing and outdoor recreation interest groups;
- Irrigation districts and organized ditch irrigators;
- Agri-businesses and timber companies;
- Economic development organizations, including Port Districts;
- Colleges
- Individual landowners.

Finally, implementing organizations will periodically encounter difficult management strategies and/or particularly complex projects that may require specialized communication functions. To tackle these difficult issues, stakeholder task forces should be formed to design and carry out specific outreach or education efforts.

The following preliminary list of potential plan projects will need supporting public involvement strategies during implementation:

- Urban CREP program
- Addressing land use and rural development issues
- Water conservation (urban and rural)

Other initiatives will also likely need public involvement. A more detailed public involvement strategy will need to be developed during plan implementation. This strategy should identify outreach elements and communication tools, messages, suggestions on communications relating to specific plan objectives, desired outcomes, capacity, budget, schedule and funding sources.

7.8.2 Funding for Public Involvement

A dedicated source of funding will be needed to support a public involvement program during implementation. This could be funded through a percent of future project and planning funding that comes into the Middle Snake region (e.g., a portion of project administration funding), and/or through a dedicated grant funding source. A funding strategy will need to be developed for sustaining public involvement during plan implementation.

7.9 Future Plan Updates

This watershed plan has been developed over a three and a half year period, with input from dozens of local leaders, state and federal agency staff, and citizens. It is a vast effort to assemble a comprehensive portrait of water resource needs, issues and solutions. The actions recommended in this plan were devised given current understanding of conditions as they exist at the time the plan was developed. Over the next several years, new data will be collected, conditions may change, regulatory and funding programs may change, and new projects affecting water resources may be proposed within the region. In addition, the implementation process may result in some modifications of the recommended actions as they are actually carried out.

To accommodate this ongoing evolution of information and events in the region, it is recommended that the watershed plan be reviewed from time to time to determine whether an update is needed. This review should be carried out by the Planning Unit, as one of its implementation responsibilities. The first review should occur within three years of the date this plan is approved by the Boards of County Commissioners for the Initiating Governments.

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

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

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

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

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Appendix B – Strategies and Tools

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Municipal – Consumer Demand Management Program for Residential, Business, and Public Properties (schools, parks, government facilities, etc) • Education – The consumer is provided information in various forums, such as with their monthly billing statements, public service announcements, newspaper articles, etc, on water conservation measures. • Positive Incentives – The consumer is offered low cost rebates, tax credits, loans, grants, and/or technical assistance in repairing leaking or upgrading to new flow faucet aerators, high efficiency showerheads, leak detection toilets, and replacement valves, etc. • Negative Incentives – The consumer is discouraged from excessive water use through increase rates (pay per use); Outdoor watering schedules are imposed (e.g., specific days of the week; early morning and late evening hours only); • Landscaping - Local governments adopt landscaping ordinances that require and/or encourage efficient, low flow watering systems; use of treated wastewater (grey water); increased use of trees/shrubs and native grasses; education on water needs for shrubs, trees, grass; mulching; weed control; use of recycled water in ornamental fountains, etc. See EPA's website (www.epa.gov/owm/water-efficiency for detailed tips on water efficiency for municipal, residential, business and landscaping.	Cost savings Generates revenue Protects drinking water resources Increases reliability of municipal supply Minimizes water pollution and health risks Reduces demand from stream sources Maintains the health of aquatic environments Reduces temperatures of surface waters with increased instream flow Less reliance on groundwater (if used for municipal supply) Saves energy used to pump, heat and treat water	*Second Engrossed Substitute House Bill 1338 – An Act Related to Municipal Water Rights (enacted in 2003)* mandates water conservation for all municipal suppliers; requires the WDOH to adopt comprehensive rules by 12/05. To fund the development and implementation of the conservation program, the bill allows WDOH to collect additional operating permit fees equivalent to 25 cents per residential service connection per year through June 2007. Consumer demand management success may depend on community's reaction to an incentive-based vs. penalty-based program.	LOW outlay of funds when compared to water savings (cost of procurement, delivery, maintenance, system expansion)	Water Management Agency City Government

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Municipal – Operational Efficiency Management Program for Water Systems • Administration / Management - Designate a water efficiency coordinator; develop a water efficiency plan (see www.epa.gov/owm/water-efficiency/inter2.htm for guidelines on developing a plan); educate and involve employees and residents in water efficiency efforts; develop and implement a voluntary Environmental Management System (EMS) to ensure compliance with environmental regulations (for more information see www.epa.gov/owm/iso14001/wm046200.) • System Maintenance - Minimize losses of water during routine flushing of mains; install leak detection equipment to find and repair leaks as soon as possible; implement a meter testing schedule to detect and repair meter failure. • System Improvements – Implement a water-loss management program (e.g. repair leaks). The water industry goal for unaccounted-for-water is 10%. Implement metering throughout your service area. Consider a reclaimed wastewater distribution system for non-potable uses. Ensure that fire hydrants are tamper proof. • Equipment Changes – Set the example in your own facility by Installing ultra-low flow toilets and urinals in municipal buildings, or by installing dams on existing toilets. Retrofit water-saving devices in flushometer valves. Install faucet aerators and low flow shower heads in municipal buildings. As municipal appliances or equipment wear out, replace them with water-saving models. Minimize the water used in cooling equipment in accordance with manufacturer's recommendations. Shut off cooling units when not needed.	Same as above plus Improves environmental performance Reduces liability Improves compliance Improves customer relations		MEDIUM to HIGH (depending on existing condition of system and magnitude of upgrades necessary)	Water Management Agencies City Government

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Eliminate "once-through" cooling of equipment with municipal water by recycling water flow to cooling tower or replacing with air-cooled equipment. Consider installing new water-saving pool filters.				
On-farm agricultural water conservation and irrigation efficiency strategies. • Evaluate crops based on market demand, water use, and methods (e.g., organic farming uses less energy overall than conventional farming) • Implement irrigation scheduling to maximize water efficiency and reduce crop stress • Replace open laterals and trenches with closed pipe systems • Replace non-pressurized irrigation systems with pressurized sprinkler systems (with flow control and pressure regulators) or drip irrigation systems • Determine distribution uniformity for irrigation and consider field leveling to maximize water efficiency • Use soil moisture sensors to prevent over-watering • Construct on-farm ponds to capture and reuse tailwater • Implement management measures listed under regional water conservation above	Saves energy used to pump water Saves water users money by reducing their energy costs Increases water availability for instream uses Reduces concentration of water pollutants Minimizes water pollution and health risks Reduces demand from stream sources Maintains the health of aquatic environments			Individual land owner
Industrial Conservation Measures Administration/Management: Appoint a water efficiency coordinator. Educate and involve employees in water efficiency efforts. Develop and implement a voluntary Environmental Management System (EMS) to ensure compliance with	Cost savings Generates revenue Protects drinking water			Industrial company

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
environmental regulations (for more information see www.epa.gov/owm/iso14001/wm046200.) Equipment Use/Maintenance: • Install high-pressure, low-volume nozzles on spray washers. • Install in-line strainers on all spray headers; inspect nozzles regularly for clogging. • Replace high-volume hoses with high-pressure, low-volume cleaning systems. • As equipment wears out, replace with water-saving models. • Equip hoses with spring loaded shutoff nozzles. • Install ultra-low flow toilets, or adjust flush valves or install dams on existing toilets. System Practices: • Detect and repair all leaks. • Identify discharges that may be re-used and implement re-use practices. Some discharges with potential for re-use are: o final rinses from tank cleaning, keg washers, fermenters o bottle and can soak and rinse water o cooler flush water, filter backwash o pasteurizer and sterilizer water o final rinses in wash cycles o boiler makeup o refrigeration equipment defrost o equipment cleaning o floor and gutter wash o Use fogging nozzles to cool products o Handle waste materials in a dry mode where possible	resources Increases reliability of municipal supply Minimizes water pollution and health risks Reduces demand from stream sources Maintains the health of aquatic environments Reduces temperatures of surface waters with increased instream flow Less reliance on groundwater (if used for municipal supply) Saves energy used to pump, heat and treat water Improves environmental performance Reduces liability			

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
o Adjust overflows from recirculation systems by controlling the rate at which make-up water is added: install float-controlled valve on the make-up line, close filling line during operation, provide surge tanks for each system to avoid overflow. o Turn off all flows during shutdowns. Use solenoid valves to stop the flow of water when production stops. o Adjust flow in sprays and other lines to meet minimum requirements. o Wash vehicles less often, or use a commercial car wash that recycles water. o Discontinue using water to clean sidewalks, driveways, loading docks, and parking lots.	Improves compliance Improves customer relations			
Water reuse facilities by wastewater utilities Recycling and reusing treated water, primarily from wastewater treatment plants. Secondary treatment of wastewater (through disinfection and biological oxidation) sample uses: • Surface irrigation of orchards and vineyards • Non-food crop irrigation • Restricted landscape impoundments • Groundwater recharge of non-potable aquifer • Wetlands, wildlife habitat, stream augmentation (with concurrence with state, federal water quality and fish and wildlife agencies) • Industrial cooling processes Tertiary/Advanced treatment of wastewater (through chemical coagulation, filtration and disinfection) sample uses: • Landscape and golf course irrigation	With appropriate treatment, can satisfy most water demands Provides a dependable, locally-controlled water supply Decreases the diversion of water from sensitive ecosystems Decreases wastewater discharges, especially to sensitive water bodies Reduces and prevents	The US Environmental Protection Agency regulates many aspects of wastewater treatment and drinking water quality, and the majority of states in the US have established criteria or guidelines for the beneficial use of recycled water. In addition, in 2004, EPA developed a technical document entitled "Guidelines for Water Reuse," which contains such information as a	LOW to HIGH initial capital outlay for infrastructure to deliver water to new use – Long term cost savings. Funding possibilities include grants from the U.S. EPA for recycled water programs.	Wastewater Facility / City government

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
• Toilet flushing • Vehicle washing • Food crop irrigation • Unrestricted recreational impoundment • Indirect potable reuse (groundwater recharge of potable aquifer and surface water reservoir augmentation)	pollution Can create or enhance wetlands and riparian habitats	summary of state requirements, and guidelines for the treatment and uses of recycled water. References: *Guidelines for Water Reuse* US EPA Office of Technology Transfer and Regulatory Support. EPA/625/R-92/004 September 1992 *Municipal Wastewater Reuse: Selected Readings on Water Reuse.* Office of Water (WH-595) EPA 430/09-91-002 September, 1991		
On-site greywater segregation and use Greywater is wastewater from domestic bathtubs, showers, bathroom sinks, washing machines, dishwashers and kitchen sinks, any source in your home other than toilets**.** Greywater can be used in place of fresh water to irrigate (below ground) the roots of trees, shrubs, and flowers. Greywater systems must	Greywater systems, used in conjunction with other conservation strategies, such as waterless toilets and subsurface drip systems for irrigation	*It's important to understand that greywater can contain harmful bacteria, viruses, and chemicals that pose a risk to*	Greywater systems are usually cheaper and easier to install during construction of a new building. Re-	Homeowner Facility Owner

Table Appendix B-1 CONSERVATION TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
irrigate below the ground surface by using a drainfield or a suitable drip irrigation system* to reduce health risks. Treatment of greywater, in accordance with Department of Health standards, is achieved through the installation and operation of a specialized on-site sewage system. Disposal of blackwater (e.g., water from toilets) must be accomplished through use of composting or incinerating toilets, an on-site sewage system, or discharge to a central sewage system. *Greywater systems are different than subsurface drip systems (SDS) (see http://www.doh.wa.gov/ehp/ts/WW/Subsurface-Drip-2002.pdf for more information on SDS guidelines.	result in a lower demand for water Increases instream flows due to decreased demand for surface water diversion or groundwater resources Saves consumers money with less costs for water	*public health and the environment if mishandled.* Some chemicals in greywater can be harmful to plants. For example, liquid detergents generally have less sodium than powdered detergents and are recommended when irrigating with greywater. With a reduction in withdrawals, a corresponding reduction in return flows would also be expected. Changes in the timing of local recharge may result.	plumbing an existing building can be expensive.	

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Construct and operate new on-channel storage facilities A water storage facility would be created by impounding flows from a river or stream. On-channel storage facilities could include large reservoirs on the mainstem of major rivers as well as small reservoirs on tributary streams. Construction would likely involve creation of an earthen and/or concrete dam. A water accounting system for allocating storage to each water right account can provide information to users regarding the risk of future water shortages. Individual water users can manage their available supply in accordance with their perception of the risk and consequences of possible water shortages. Water districts, cities, and other public entities may take appropriate action in anticipation of impending shortages. Water rights marketing and implementation of water conservation measures may be triggered by low levels of storage.	Provides reliability of water supply Increases supply to multiple users Flood control Increases groundwater recharge in vicinity of storage area Well-controlled rate of release of water Grade control could slow the flow of water from upstream to downstream so that water remains in the stream for a longer period of time and low flow periods can be delayed	On-channel storage impoundments can be controversial, particularly when done on a large scale. Impoundments can significantly alter the existing hydrograph and habitat. The permits required in general for on-channel storage could include: (1) a license from FERC (if the facility will also generate electricity); (2) an environmental impact statement under the State Environmental Policy Act (SEPA) and/or NEPA (if federal funding is involved); (3) a Water Quality Certification under Section 401 of the Federal Clean Water Act; (4) a dredge and fill permit under Section 404 of the Federal Clean Water Act (this permit provides veto authority to the USEPA); (5) approval under the Shoreline process by the county of jurisdiction (DOE has veto authority over this process approval); (6) a hydraulic project approval under Chapter 75.20 RCW from the Washington State Department of Fish and Wildlife; (7) a National Pollutant Discharge Elimination System (NPDES) permit under Section 402 of the Federal Clean Water Act; (8) a	HIGH	Local government / Utility

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		water permit under RCW 90.03.250 through RCW 90.03.320 obtained from the Department of Ecology; and, (9) a water reservoir permit under RCW 90.03.370 was also obtained from the Department of Ecology.		
Raise and operate existing on-channel storage facilities The capacity of an existing on-channel reservoir could be increased by raising or enlarging the impoundment structure.	Provides reliability of water supply Increases supply to multiple uses and users Flood control Increases groundwater recharge in vicinity of storage area Well-controlled rate of release of water	Existing permits would need to be modified and or re-issued to accommodate a larger structure and/or larger surface area impact. Modifications to existing dam structures must be also be authorized by the Dam Safety Office and must conform to the provisions and guidelines for structure modification outlined in WAC-173-175.	MEDIUM to HIGH depending on the extent of the expansion Lower cost than new construction	Local government / Utility
Construct and operate new off-channel storage facilities There is a large quantity of water stored naturally as snow pack each year that melts and flows to the state's rivers in the late spring and early summer. An impoundment structure, either earthen or concrete, would be created in an upland location to capture these flows. Alternatively, water would be diverted, or more likely pumped depending on topography, from a	Enhances low stream flows. Provides reliability of water supply Increases groundwater recharge in vicinity of storage area Flood control	Regulatory constraints of off-stream storage impoundments are much less problematic than for in-stream projects. Some constraints arise in the regulations regarding placement of dams. Other regulatory concerns would be introduced through SEPA and local land use regulations. Off-stream storage reservoirs are, however, generally subject to less complex regulatory processing.	HIGH	Local government

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
river during high flow periods to an off-channel location for storage. Off-channel facilities could have a wide range of capacities.	Increases wetland function Enhances wildlife habitat values Creates watered riparian areas Well-controlled rate of release of water			
Raise and operate existing off-channel storage facilities The capacity of an existing off-channel reservoir could be increased by raising or enlarging the impoundment structure.	Provides reliability of water supply Increases supply to multiple uses and users Flood control Increases groundwater recharge in vicinity of storage Increases wetland function Enhances wildlife habitat values Creates watered riparian areas Well-controlled rate of	Existing permits would need to be modified and or re-issued to accommodate a larger structure and/or larger surface area impact. Modifications to existing dam structures may be also be authorized by the Dam Safety Office and must conform to the provisions and guidelines for structure modification outlined in WAC-173-175.	MEDIUM to HIGH depending on the extent of the expansion. Lower cost than new construction.	Local government / Utility

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
	release of water			
Use existing storage facilities for additional beneficial uses Operation of a storage facility constructed to provide water for one specific beneficial use or group of uses could be modified to provide for additional beneficial uses. For example, use of a storage facility originally constructed for municipal water supply could be expanded to supply water for irrigation or to provide additional flows for fish during critical life stages.	Enhances reliability of water supply Increases supply to multiple uses and users Controlled rate of release of water can be used to enhance downstream water supply, habitat, and water quality	Existing permits would need to be modified and or re-issued to accommodate a larger structure and/or larger surface area impact. Modifications to existing dam structures may be also be authorized by the Dam Safety Office and must conform to the provisions and guidelines for structure modification outlined in WAC-173-175. Multiple uses may come into conflict, particularly during periods of low flow. For example, withdrawing water to meet irrigation needs in late summer could conflict with habitat and/or recreation use of a reservoir.	MEDIUM to HIGH depending on the extent of the expansion Lower cost than new construction	Local government / Utility
Construct and operate artificial recharge / aquifer storage projects Aquifer storage and recovery involves introducing water, usually surface water diverted during high flows into an aquifer through injection wells or through surface spreading and infiltration. Water is diverted from the stream, conveyed to an infiltration pond and allowed to infiltrate into the alluvial aquifer. The water may be stored in the aquifer for some time before it flows back to the stream or until needed and withdrawn from the aquifer	Enhances reliability of water supply Increases supply to multiple uses and users Increase instream flows as demand for surface flows is met through other sources	Water to be stored in an aquifer must meet the state's groundwater quality standards, Chapter 173-200 WAC. The injected water must meet: a) the quality of the receiving aquifer; b) drinking water standards; or, c) the required quality characteristics of the highest use made of the water from the receiving aquifer, which ever is the highest quality. Issues regarding the water rights of	MEDIUM	Local government / Utility

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
through wells for beneficial use. The aquifer serves as an underground reservoir that provides baseflow to streams. Per RCW 90.03.370, aquifer storage and recovery does not refer to operational losses of water during irrigation of land; to water artificially stored due to construction, operation or maintenance of an irrigation system; or to projects involving recharge of reclaimed water. Aquifer storage options may include enhanced infiltration or direct recharge of aquifers from recharge ponds or wells, although the technical issues and permitting requirements are more substantial for the latter option. It also may be possible to enhance infiltration to aquifers from alternative land-use practices. Enhanced infiltration could include employing no-till farming techniques to decrease runoff and increase infiltration or using other methods to reduce runoff.		artificially stored ground water can become very complex, with the level of complexity dependent on the specific site and situation. See Chapter 90.44.130, and Chapter 90.03 RCW related to reservoir permits. There are SEPA issues for these projects, which must be addressed.		
New riparian storage or farm field flooding storage Store surface water close to the river within the riparian zone. Water could be diverted during peak flow periods and stored in a location close to the stream. The stored water may be released later in the year to supplement low flow and provide improved habitat for fish and other water users. Options under this category could	Supplements instream flows, especially during high use and low precipitation periods Improves aquatic habitat Improves riparian areas	Does not provide option of storing water through the summer. Unless properly designed and maintained, erosion could occur. Feasibility assessment should include careful study of potential water quality impacts, including ground water quality	HIGH due to significant land requirements Losses from taking land out of agricultural production	Local government / land management agency / fish and wildlife agency

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
include modifying existing levees and flooding fields. Farm fields located near a stream may provide possible sites for water storage/spreading techniques. Water could be delivered to agricultural land during high flow spring runoff. Existing levees could be modified with a weir or other type of release structure. Water from the stream could potentially overflow onto the farm fields during peak flow periods and infiltrate into the ground. This water could drain through the soil and slowly seep into the stream.	Provides reliability of water supply Increases supply to multiple uses and users	from mineral/salt deposition, nutrient leaching, etc.		

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
New or modified riparian wetlands Expand existing wetlands or construct new wetlands in the riparian zone. Riparian wetlands could be expanded to increase the potential water storage volume or a new wetland could be constructed as an additional storage site. Water that is released or overflows into a wetland during peak flow periods may remain for some time, although the amount of water stored and the rate of release would be dependent on the ability to capture and store water while minimizing seepage losses. Infiltration of water from the wetland may increase aquifer storage, providing more summer baseflow. Diverting streamflow to wetlands may require a diversion structure, modification of existing wetlands or alteration of existing levees.	Reduces flood peaks Improves water quality Increases aquatic habitat Enhances reliability of water source Newly created wetlands can be a source of mitigation for other projects that impact wetlands. The developed wetland credits can be "sold" to other parties, or held as a "wetland bank" against future need.	Although wetlands provide many benefits, the storage capacity is not as great as a reservoir of the same area and there is less control over the rate of release of water back into the stream. Rate of release is difficult to control Creation of a wetland will require permits from state and federal authorities, including CWA Section 404 permits from the Corps.	LOW to MEDIUM depending on the amount of land required for development	Local government / land management agency / fish and wildlife agency
Modification of existing sediment basins Sediment basins are used to trap sediment entering a stream from uplands or tributary valleys and, as a secondary result, can slow water flow though the basin into the stream. Sediment basins are typically designed to hold water only long enough for sediment to filter out and would need to be modified to serve as storage facilities. Sediment basins could be improved, expanded or constructed in new areas to store water. Other modifications may increase the sediment	Improves water quality by reducing sediment load to receiving streams Augments low flows for a longer period of time through the year	Control of flow release may be difficult with this type of secondary storage. Sediment basins require periodic maintenance to maintain capacity.	LOW due to possible use of existing structures Costs associated with regular maintenance to achieve optimal operation and to maintain water quality.	Local government / land management agency / fish and wildlife agency / Landowners

Table Appendix B-2 WATER STORAGE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
filtration efficiency and/or decrease the rate of water released such that stored water could provide supplemental flows into the low-flow period.				
Alternative source for irrigation Basalt aquifers could potentially be used as an irrigation source in place of surface water, although the depth to water and pumping costs are unknown. If artesian conditions are present, this could eliminate the need for pumping.	Reduces demand for surface flows Improves aquatic habitat Improves water quality Increase reliability of water supply	Requires development of new source of water, may require new water right. Aquifer use may not be sustainable. Basalt aquifers are complex, and determining connectivity, recharge, and sustainable yields can be difficult and expensive.	UNKNOWN, dependent on depth to water and pumping costs	Irrigation Districts / Landowners
Direct stream augmentation Water could be pumped from the basalt aquifer to the stream.	Supplements streamflow during periods of low flow. Decreases stream temperatures during summer months	Requires development of new source of water, may require new water right. Aquifer use may not be sustainable. Basalt aquifers are complex, and determining connectivity, recharge, and sustainable yields can be difficult and expensive.	MEDIUM	Local government / water utility
New water supply A regional groundwater study could provide information on new water supply possibilities for municipal or agricultural purposes. The regional ground water study would provide information on locations and aquifer target depths, water quality, water temperature, production rates. Test wells could be installed which could be used to supplement supply or streamflow for one of the above options.	Provides reliability of water supply Increases supply to multiple uses and users Increase instream flows as demand for surface flows is met through other sources	Requires development of new source of water, may require new water right. Aquifer use may not be sustainable. Basalt aquifers are complex, and determining connectivity, recharge, and sustainable yields can be difficult and expensive.	LOW to MEDIUM for study costs MEDIUM to HIGH for implementation costs	Local government / regional government entity / water utility

Table B-3 REGULATORY / ADMINISTRATIVE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Transfer existing water rights for out-of-stream uses to other out-of-stream beneficial uses Water rights change or transfer through Ecology or local county conservancy board to change place of use, point of diversion, time of water use and/or type of use consistent with goals and objectives of the watershed plan.	Beneficial out-of-stream uses, identified by the watershed planning group, could be fulfilled	Potential for third party impairment of existing water right holders	LOW	Watershed Plan: Planning Unit Water Right Holder
Transfer existing water rights for out-of-stream uses to instream beneficial uses through the Trust Water Right Program Trust water rights may be held by Ecology or "authorized for use for instream flows, irrigation, municipal or other beneficial uses consistent with applicable regional plans for pilot planning areas, or to resolve critical water supply problems" (RCW 90.42.040). Trust water rights can derive generally from two sources: • Water saved through state or federally funded conservation and available to other uses without impact on existing rights, "net saved water", can be acquired by the state from the conserver through a voluntary agreement; and • Voluntary transfer to the state of an existing water right (or portion thereof), through lease, donation, or purchase, but not by condemnation.	Beneficial instream uses, identified by the watershed planning group, could be fulfilled Reduces demand from stream sources Increased streamflows can enhance the health of aquatic environments Increased streamflows can reduce temperature of surface waters	Trust water rights maintain the priority date of the original water right, unless the water right is split between the original user and the state, in which case the trust water right is inferior in priority. Trust water rights can redirect the use of conserved water. The amount of water which was previously beneficially used as part of the water right forms the basis for transfer to a trust water right. Water which has been beneficially used and then transferred to the trust program is not subject to relinquishment.	LOW	Water Right Holder
Transfer water through interties of public water systems or irrigation systems	Increases water system reliability	Existing water users may object over transfer of water that may	MEDIUM to HIGH depending	Water Management Agencies/ City

Table B-3 REGULATORY / ADMINISTRATIVE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Interties are interconnections between two or more water systems that allow the exchange or delivery of water between systems. Interties are typically used between adjacent public water systems. Transfers of public water through such interties are managed by a joint board of control, established pursuant to Chapter 87.80 RCW.	Benefits to public health and resource management objectives Enhances the manageability of the water system Provides opportunities for conjunctive use Delays or avoids the need to develop new water sources	impact junior water users or in condemnation cases	on infrastructure necessary for intertie between systems	Government
Short-term or long-term allocation Allocate additional ground or surface water on a short-term or long-term basis from a specific source (surface water body or aquifer) for a specific beneficial use. Specific beneficial uses could include municipal supply or multiple beneficial uses.	Beneficial use could be fulfilled	Potential legal and/or social implications from existing water users relying on water allocated to beneficial uses.	LOW	Washington Department of Ecology
Complete or partial closure of a basin or subbasin from appropriations The Water Resources Act of 1971 (Chapter 90.54 RCW) provides authority for Ecology to withdraw waters in a basin or subbasin from further appropriation based on a determination that insufficient information and data are available to support sound resource allocation decisions or that water resources have been over-appropriated. The rule can close areas during certain periods, creates reservations for domestic and stock watering uses and clarifies the requirements for out of stream uses.	Beneficial instream uses could be fulfilled Reduces demand from stream sources Maintains the health of aquatic environments Reduces temperatures of surface waters with increased instream flow	Prior to initiating such rule making, Ecology is required to consult with the standing committees of the State Senate and House of Representatives with jurisdiction over water resources. Potential legal and/or social implications of cutting off access to water source by potential water users.	LOW The exact cost depends on location, frequency of proposed uses, alternatives, and the value of existing interruptible rights.	Washington Department of Ecology

Table B-3 REGULATORY / ADMINISTRATIVE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		Future, permitted, year around, consumptive uses, which are not eligible for the reservation, may obtain water through mitigation and transfers during the closure periods.		
Adjudication of water rights One or more persons claiming a right to divert water, or the Department of Ecology, can petition to conduct an adjudication of the water source. An adjudication would codify valid water rights for the water source. Under the adjudication process, Ecology must file with the Superior Court a report containing the names of all those claiming a right to use water, a description of the claim, and a brief statement of facts relating to each claim and water use. Those claiming a right to use water are defendants in the adjudication and bear the burden of proving their claimed right. At the end of the adjudication, the court issues a decree confirming water rights and describing the nature of those rights. Ecology then issues water right certificates that incorporate the court's findings. Water rights that are not confirmed by the court are lost or extinguished.	Determines the existence, amount and priorities of existing water rights, if such issues are in question for a water source		LOW	Washington Department of Ecology
Assignment of a watermaster Water users in a basin, subbasin or other geographical area may request that Ecology assign a watermaster, who would be appointed, compensated and supervised by Ecology. A watermaster controls the use of water in a	Provides regulatory enforcement to ensure water rights are fulfilled appropriately with sufficient supply Reduces loss to legitimate water	In an adjudicated basin or subbasin, Ecology may appoint a 'stream patrolman' to regulate water use. A stream patrolman has the same powers as a water master, but the stream	LOW	Washington Department of Ecology

Table B-3 REGULATORY / ADMINISTRATIVE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
designated water district by regulating headgates and reservoirs to prevent the use of water in excess of the amount to which water right holders are entitled.	right holders by illegal diversions	patrolman's jurisdiction is limited to the adjudicated stream.		
Increase enforcement against illegal water use within a basin or subbasin. Ecology would assign staff to focus on enforcement activities within a basin or subbasin identified by a watershed plan.	Provides regulatory enforcement to ensure water rights are fulfilled appropriately with sufficient supply Reduces loss to legitimate water right holders by illegal diversions	Potential legal and social ramifications of increased regulation on water users.	LOW	Washington Department of Ecology
Evaluate existing water rights within a basin or subbasin (without an adjudication) Ecology would assign staff to determine if quantities of water allocated through water rights are being put to a beneficial use and over what time period; what rights have been partially or totally abandoned; and what rights have not been put to a beneficial use for a period of at least five consecutive years without sufficient cause. The information would be used to determine whether additional water resources would be available or not in the basin or subbasin, and if rights were eligible for relinquishment.	Accurate accounting of water may allow for future allocations for beneficial out-of-stream or instream uses Increases surface and ground water levels provided unused rights are relinquished	Potential legal and social ramifications of increased regulation on existing water right permittees	LOW	Washington Department of Ecology
Evaluate tribal water rights claims within a basin or subbasin Indian tribes with treaties that reserved water rights in perpetuity may claim water rights within a basin or subbasin. Tribal water right claims are usually asserted to protect tribal fishing rights and	Provides information necessary to settle tribal water rights claims Provides certainty for future water use if claims are settled	Settlement of tribal water rights claims are often lengthy and costly and can become divisive.	MEDIUM	Federal and Tribal governments

Table B-3 REGULATORY / ADMINISTRATIVE TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
fish resources.	Supports the protection and restoration of fish species			
Adopt rules and/or regulations regarding wells Chapter 90.44 RCW establishes an exemption from water right permitting requirements for ground water for: "stock watering purposes, for the watering of a lawn, of a noncommercial garden not exceeding one-half acre in area, for single, group domestic uses in an amount not exceeding 5000 gallons per day, or for an industrial purpose in an amount not exceeding 5000 gallons per day." Minimize the use of exempt wells; restrictions on the siting of wells in proximity to streams and/or restriction of the finished depth of new wells to the second aquifer unit or lower; restrictions on new exempt wells when water from a public water system is reasonably available to serve an affected property.	Reduces potential impairment to existing water rights Reduces impact of shallow groundwater withdrawals on surface water flows Increases documentation which would provide more information to assess current and future impacts on senior water rights	A person with an exempt well may apply for a water right permit. Ecology must review applications for water right permits, even exempt uses of water. The following criteria used in water right decisions are defined in *RCW 90.03.290*: *"…if it shall find that there is water available for appropriation for a beneficial use, and the appropriation thereof as proposed in the application will not impair existing rights or be detrimental to the public welfare…"*	LOW	Local governments / Washington Department of Ecology
Extend public water system services into areas served by exempt wells Where adequate public water supplies are available, extend public water system services into areas served by exempt wells and require new developments to connect to the public water system.	Reduces impact to groundwater Reduces impact of shallow groundwater withdrawals on surface water flows	Landowners with existing exempt wells could be encouraged, but not required to connect to the public water system, unless the property owner chose to develop a new exempt well.	LOW	Local government/water management agency

Table B-4				
WATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Develop a Total Maximum Daily Load (TMDL) Water Cleanup Plan A TMDL includes a technical study (assessment), an analysis of the data, an implementation plan, and a monitoring plan. The assessment of a water body is conducted to determine the amount of pollutant that the water body may accept and still meet water quality standards. The data analysis allows Ecology to determine how much reduction of a pollutant will be required to meet State standards. The implementation plan is a strategy used to manage the pollutant at its source. Finally, a monitoring plan is put in place to determine the efficacy of implementing the plan	Achieves compliance with State criteria for surface water quality	The entire process is estimated to take approximately five years from start to finish. A flexible schedule is allowed for TMDL compliance because non-point source implementation is not an exact science. Interim targets are compared to monitoring data at regular intervals, as the targets and data are compared, the progress toward improved water quality conditions is assessed, and adjustments or changes in the TMDL strategy are publicly discussed		Washington Department of Ecology
Develop a Soil Water Assessment Tool (SWAT). Develop a model to analyze the erosion and sediment loading characteristics of the Basin as impacted by historical and current (or projected) agricultural practices.	Assesses positive impacts of implementing alternative agricultural management practices			Planning Unit, Conservation Districts
Implement Irrigation Water Management by implementing delivery system improvements, irrigation scheduling and management, on-farm irrigation system upgrades/	Reduces non-point source impacts			Landowners, Conservation Districts, NRCS

Table B-4 WATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
conversions, constructing on-farm and off-farm sediment ponds				
Implement cropland management activities such as implementing in-furrow residue placement, row crop erosion control and tillage management	Reduces non-point source impacts			Landowners, Conservation Districts, NRCS
Implement Agricultural Chemical Practices such as: Split Fertilizer Applications, Soil Fertility Testing, Pesticide Application Training, Pesticide Licensing Programs, Row Crop Soil Erosion Controls, Irrigation Water Management, Deep Percolation Evaluations, Wind Criteria for Pesticide Application	Reduces non-point source impacts			Landowners, Conservation Districts, NRCS, DOH
Implement Livestock Management Practices such as: providing technical/financial support to confined animal feeding operations (CAFO); NPDES Permitting of CAFOs; Dairy Permit Programs; voluntary fencing of streams And buffer strips near streams; participating in small landowner assistance programs; applying public land grazing programs; manure management; supporting conservation district efforts regarding dairies	Reduces non-point source impacts			Landowners, Conservation Districts, NRCS
Implement Other Agricultural Controls/Practices such as conducting aquatic weed control evaluations, removing silt from canals/laterals, controlling canal weeds, conducing pesticide residue monitoring on aquatic life; conducting soil monitoring for pesticides	Reduces non-point source impacts			Landowners, Conservation Districts, NRCS
Implement BMPS on State, County, and City	Reduces overall pollutant load			State, County and City

Table B-4 WATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Roads Implement BMPs for road maintenance, grading and new construction; control chemical applications such as roadside spraying for weed control, de-icing to minimize water quality impacts	from roads on water resources			road departments
Plan/Implement Municipal Stormwater Runoff Control Develop municipal stormwater ordinances, regional stormwater runoff control guidelines, municipal stormwater control plans, regional stormwater impact assessments, urban/suburban land use awareness programs, transportation/deicing guidelines, hazardous household waste disposal sites and/or pickup programs	Reduces overall pollutant load on water resources			State, County and City governments
Plan/Implement Industrial Stormwater Runoff Control Develop industrial stormwater ordinances, regional industrial stormwater guidelines, industrial stormwater control plans, regional stormwater impact assessments	Reduces overall pollutant load on water resources			Applicable industries
Manage Urban Landscaping by developing ordinances, educational awareness programs, demonstration projects to encourage	Reduces runoff and overall pollutant load on water resources			Municipal governments, parks and recreation departments, water and wastewater utilities
Implement a pollution trading (credit) system for water to facilitate compliance with a Total Maximum Daily Load (TMDL). Under a pollution trading system, proponents of a new or expanding contaminant generating land or water use could receive a number of pollution	Provides additional flexibility in management of facilities	The transaction would need to result in a net reduction in contaminant loading within the area addressed by the trading system (more contaminant loading would be eliminated in	LOW	Washington Department of Ecology

Table B-4 WATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
"credits" by reducing a specific amount of existing contaminant loading to surface or ground water. The reduction in contamination load could be accomplished by modifying facilities owned by the proponent, by paying owners or operators of other contaminant generating facilities to make operational changes, or by purchasing and retiring contaminant generating facilities. The proponent can then redeem the "credits" for approval of the new or expanding contaminant generating land or water use, provide appropriate pollution controls were applied.		obtaining credits than would be created by the new or expanding land or water use).		
Incorporate requirements for improving the quality of discharges from existing industries when issued State Waste Discharge Permits or National Pollutant Discharge Elimination System Permits (NPDES). Ecology would need to evaluate State Waste Discharge Permits and NPDES permits on a case-by-case basis to ensure that such requirements represent or incorporate all known, available, and reasonable methods of prevention, control and treatment. Should it be determined that additional increments of prevention, treatment and control could reasonably be attained, permit requirements would be modified to help ensure that such incremental improvements would be achieved.	Improves water quality		LOW to MEDIUM depending on nature of methods chosen to implement permit changes	Washington Department of Ecology
Increase the level of inspection of commercial dairy operations and enforcement of water quality as appropriate. Ecology's Water Quality Program currently	Improves water quality		LOW to MEDIUM depending on whether increased inspections result	Washington Department of Ecology

Table B-4				
WATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
maintains a dairy inspection program to administer the provisions of the state's Dairy Nutrient Management Act (Chapter 90.64 RCW) and the wastewater discharge general permit for dairy farms issued under requirements of the Clean Water Act. The primary purpose of the inspection program is to prevent entry of wastes into waters of the state.			in increased enforcement costs for agency and dairy operator	

Table B-5				
GROUNDWATER MANAGEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Develop a Groundwater Management Program (GWMP). RCW 90.44.00 through 90.44.440 enacted in 1985 provides the statutory mechanism for local agencies and groundwater user groups to initiate and develop Groundwater Management Programs (GWMP). The purpose of the law is to identify groundwater management procedures that are consistent with both local and State water resource policies and management objectives, including protection of water quality, assurance of quantity and efficient management of water resources to meet future needs.	Allows a better understanding of an area's groundwater system identifies existing and potential problems develop the management program to address the problems	Ecology considers several criteria to evaluate whether GWMA designation is to be granted. These criteria include: (1) Areas where groundwater quality is susceptible to contamination; (2) aquifers that are declining due to limited recharge or over-utilization; (3) aquifers that have been over-appropriated; (4) aquifers designated as "sole source aquifers" by EPA; (5) aquifers designated as the primary source of a public water supply; and (6) aquifer for which an approved Coordinated Water System Plan has identified a need for a groundwater management program.	LOW (includes opportunity for up to 50 percent grant/loan assistance from the State Centennial Clean Water Fund)	Planning Unit, local governments, Conservation Districts, Washington Department of Ecology
Implement water demand reduction strategies (see specific recommendations under Table X-1, Water Conservation Tools) Water conservation refers to the beneficial reduction of water use, loss, or waste. Conservation measures can be implemented within the municipal, industrial, and agricultural sectors. Water reclamation and reuse refers to the capture, treatment, and reuse of water typically for	Benefits both surface and groundwater management by reducing demand on groundwater resources Reduces pumping rates Delays or eliminates needs to expand or develop new sources of supply to meet demand	The Washington State Department of Health (DOH) requires a water conservation plan from public water systems as a condition for approval of water system plans and issuance of new water rights permits..		Landowners, agricultural producers, irrigation districts, industry, municipal water users, governments

Table B-5 GROUNDWATER MANAGEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
non-potable purposes.				
Implement recharge enhancement with shallow aquifer recharge (SAR) projects Shallow Aquifer Recharge (SAR) assumes that the capture of winter-spring peak flows can be used to successfully recharge a portion of the depleted shallow aquifer system and at least locally provide benefit to the interconnected groundwater and surface water system. The concept of SAR essentially attempts to mimic the natural water cycle as it existed historically in the Basin prior to river channelization, implementation of irrigation efficiency projects (e.g.,, ditch lining and piping that reduce groundwater recharge), and the advent of significant groundwater and surface water use.	potentially recharges shallow groundwater potentially reverses trends seen in declining spring creek flows increases stream baseflows decreases water temperatures	The State of Washington Growth Management Act (GMA) requires each county in the state of Washington to designate critical areas and to prepare critical areas ordinances (CAO). CAOs regulate activities in critical areas including, among other things, areas with a critical recharging effect on aquifers used for potable water, otherwise known as Critical Aquifer Recharge Areas (CARA). CARAs are required to be classified, designated, and regulated when a municipality (e.g., a city, a county, a water district) has aquifer recharge areas within its boundaries (RCW 36.70A).		
Implement recharge enhancement with aquifer storage and recovery (ASR) In areas where water availability is limited on a seasonal basis, excess water can be injected or infiltrated into groundwater aquifers during wet periods and then withdrawn during dry periods to aid in meeting water demands.	Reduces and/or potentially reverses rate of water level declines in aquifer Optimizes use of existing water resources			
Implement Water Rights Transfers (see specific recommendations under Table X-3, Regulatory/Administrative Tools)	Redirects water use from less valued applications to more valued ones			

Table B-5				
GROUNDWATER MANAGEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Identify opportunities for groundwater rights transfers/purchase/lease and streamlining the process. This strategy involves changing an existing water right to meet needs associated with a different use or a different location than originally defined in the water right. Transfers (also known as water right changes) do not increase the overall amount of water being used in a basin; rather, they can modify where, how, and when the water is used.	accommodates future supply needs without a net increase in consumptive appropriations			

Table B-5 GROUNDWATER MANAGEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Pursue regional coordination Develop regional coordination of groundwater use and development. The coordination effort should identify actions, strategies, roles and responsibilities for improving surface and groundwater monitoring, management and conservation, conjunctive use strategies and updating regional coordination efforts. The focus of regional coordination should be on developing a well-managed supply diversion program.	optimizes the use and development of the groundwater resource and integrate the supply plans (including water conservation) of major purveyors with other users (e.g., smaller communities, large industries, and developments).	Coordination efforts should encourage new urban or suburban developments or industrial facilities that require new or expanded water supplies obtain water from existing municipal or other water suppliers rather than developing separate sources of supply		
Conduct groundwater monitoring program, including development of a groundwater model A groundwater model should be developed which effectively simulates the gravel and basalt aquifer systems. Potential components of a groundwater model would include to: (1) estimate of the amount of water available from the aquifer supporting well sources; (2) evaluation of the recharge capacity of the aquifer; (3) identification of recharge rates and operational scenarios to maximize aquifer storage capacity; and (4) recommendations for use of the model as a basis for future groundwater management evaluation The information generated from the monitoring program can be used to refine the model and the input data. An adaptive management program should be developed to integrate information collected under monitoring network and modeling efforts into the comprehensive management strategy.	Develops a better understanding of surface / groundwater interactions Can be used to simulate the long-term impacts of aquifer storage recharge projects and the response of the aquifer to continued long-term withdrawals Can be used to evaluate impacts of different water use scenarios or trends Can be used to establish water budget for demands from groundwater system	A large network of wells for water level monitoring would be needed throughout the basin for both the gravel and basalt aquifers. As part of this effort, well discharges should also be monitored.		

Table B-5				
GROUNDWATER MANAGEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Conduct a hydrogeologic study. Develop a better understanding of surface /groundwater interaction by conducting a hydrogeologic study. A study should focus on characterizing hydraulic continuity in the basin. As part of this effort, stream flows should continue to be monitored to assess surface water and groundwater relationships.				

Table B-6				
GROUNDWATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Conduct "level 1" risk assessment. Develop land use and hydrogeologic screening criteria. Evaluate existing databases and develop GIS database in coordination with Ecology, DOH, and county governments. Produce regional maps showing results of risk assessment.	Assesses susceptibility of groundwater supplies to contamination on a regional basis		LOW	Planning Unit, local governments
Identify land use activities and contaminants to be addressed with technical management strategies Land use activities and contaminants of concern will depend on region specific groundwater quality results obtained from the assessment and monitoring actions.	Assesses susceptibility of groundwater supplies to contamination on a regional basis		LOW	Planning Unit, local governments
Enforce Wellhead Protection Program requirements for all Group A Public Water Systems (PWS)	Provides protection for groundwater sources for public health and safety		LOW	Washington Department of Health
Encourage Group B Public Water Systems to voluntarily establish a wellhead protection program Group B PWSs are not required to conduct wellhead protection under current regulations. Encourage entities to prepare a simplified wellhead protection plan.	Provides protection for groundwater sources for public health and safety		LOW	Washington Department of Health
Select and implement technical management strategies based on assessment findings For example, strategies could include implementation of BMPs for fertilizer and pesticide application, irrigation management	Minimizes impacts of land use activities on groundwater supplies		LOW to MEDIUM depending on strategies implemented	Landowners, local governments, conservation districts

Table B-6 GROUNDWATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
practices, and manure handling, establishment of guidelines to limit septic system densities in new developments; extension of sewer lines to areas with septic systems; establishment of more stringent guidelines for land application of wastewater and on-site disposal of non-domestic wastewater from industrial facilities.				
Evaluate the need for greater involvement of stakeholders in cleanup actions at Ecology-regulated facilities and sites Work with Ecology to ensure that remediation actions are sufficient to protect existing and future groundwater supplies. Ecology should notify implementing agency where proposed remediation actions may not restore groundwater to concentrations below MCLs (maximum concentration levels).	Assists with cleanup of sources of groundwater contamination		LOW	Washington Department of Ecology, Planning Unit, local governments, landowners, conservation districts
Evaluate the need for independent cleanup actions Investigate potential for providing technical /financial assistance to remove source of contamination associated with Ecology cleanup programs, e.g., septic systems, agricultural operations, etc.	Assists with cleanup of sources of groundwater contamination		LOW	Planning Unit, local governments
Provide oversight for well decommissions to ensure decommissions consistent with safe practices	Provides protection for groundwater sources for public health and safety		LOW	Washington Department of Ecology
Assess drinking water supplies that are unprotected and "at risk" of becoming impacted in the future Further assessment should focus on those areas in	Provides protection for groundwater sources for public health and safety		LOW	Planning Unit, Washington Department of Health

Table B-6 GROUNDWATER QUALITY TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
which development has occurred or is likely to occur within the Planning Unit's 20 year planning horizon. Since future wellhead placement may not occur near or within existing developed land or on land proposed for future development, the assessment focus should be on the protection of currently undeveloped areas slated for future groundwater production.				
Develop and implement management protocols of unprotected groundwater sources located outside the service areas of large and medium water purveyors Technical and/or financial assistance should be provided to these small systems to complete formal or informal wellhead protection activities. Assistance should be concentrated in areas with groundwater supplies that are already impacted or "at risk" of becoming impacted in the future.	Provides protection for groundwater sources for public health and safety		LOW	Planning Unit, Washington Department of Health

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Encourage landowner participation in the Conservation Reserve Enhancement Program (CREP). CREP is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. The program is a partnership among producers; tribal, state, and federal governments; and, in some cases, private groups. CREP addresses high-priority conservation issues of both local and national significance, such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations such as salmon. CREP is a community-based, results-oriented effort centered on local participation and leadership.	Supplements farm income for participants. CREP provides payments to participants who offer eligible land. A federal annual rental rate, including an FSA state committee-determined maintenance incentive payment, is offered, plus cost-share of up to 50 percent of the eligible costs to install the practice. Further, the program generally offers a sign-up incentive for participants to install specific practices. Enrollment can be on a continuous basis, allowing landowners to join the program at any time rather than waiting for specific sign-up periods Supports increased conservation practices Protects streams, lakes, and rivers from sedimentation and agricultural runoff Helps landowners develop and restore wetlands through the planting of appropriate	CREP: Enrollment in a state is limited to specific geographic areas and practices. Land must be owned or leased for at least one year prior to enrollment to be eligible, and must be physically and legally capable of being cropped in a normal manner. Land must also meet cropping history and other eligibility requirements CREP contracts require a 10- to 15-year commitment to keep lands out of agricultural production.	LOW	USDA Farm Service Agency (FSA); private landowners.

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
	groundcover Annual monitoring measures progress			
Encourage landowner participation in the Environmental Quality Incentives Program (EQIP). EQIP was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land. These contracts provide incentive payments and cost-shares to implement conservation practices. Persons who are engaged in livestock or agricultural production on eligible land may participate in the EQIP program. EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. EQIP may provide cost-sharing of up to 75 percent of the costs of certain conservation practices. Incentive payments may be provided for up to three years to encourage producers to carry out management practices they may not otherwise use without the incentive. However, limited resource	Supplements farm income for participating landowners Reduces non-point source pollution, such as nutrients, sediment, pesticides, or excess salinity in impaired watersheds, consistent with Total Maximum Daily Loads (TMDLs) Reduces groundwater contamination Conserves ground and surface water resources Reduces emissions, such as particulate matter, nitrogen oxides (NOx), volatile organic compounds, and ozone precursors and depleters that contribute to air quality impairment violations of National Ambient Air Quality Standards	Contracts are a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. The practices are subject to NRCS technical standards adapted for local conditions. The local conservation district approves the plan. An individual or entity may not receive, directly or indirectly, cost-share or incentive payments that, in the aggregate, exceed $450,000 for all EQIP contracts entered during the term of the Farm Bill.	LOW	USDA Natural Resource Conservation Service (NRCS); private landowners

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
producers and beginning farmers and ranchers may be eligible for cost-shares up to 90 percent. Farmers and ranchers may elect to use a certified third-party provider for technical assistance.	Reduces soil erosion and sedimentation on agricultural land Promotes habitat conservation for at-risk species			
Encourage landowner participation in the Wetlands Reserve Program (WRP). The Wetlands Reserve Program is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. Landowners are provided technical and financial support for their wetland restoration efforts in exchange for retiring marginal land from agricultural production. The goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. The program offers three enrollment options: *Permanent Easement*. This is a conservation easement in perpetuity. Easement payments for this option equal the lowest of three amounts: the agricultural value of the land, an established payment cap, or an amount offered by the landowner. In addition to paying for the easement, USDA pays 100 percent of the costs of restoring the wetland. *30-Year Easement*. Easement payments through this option are 75 percent of what would be paid for a permanent easement.	Supplements farm income for participating landowners Improves wetland functions Improves fish and wildlife habitat Improves water quality by filtering chemicals and sediment Reduces downstream flooding Increases groundwater recharge Protects biological diversity Establishes long-term conservation and wildlife practices and protection on private lands	To offer a conservation easement, the landowner must have owned the land for at least 12 months prior to enrolling it in the program, unless the land was inherited, the landowner exercised the landowner's right of redemption after foreclosure, or the landowner can prove the land was not obtained for the purpose of enrolling it in the program. To participate in a restoration cost-share agreement, the landowner must show evidence of ownership. To be eligible for WRP, land must be restorable and be suitable for wildlife benefits. This includes: Wetlands farmed under natural conditions; farmed wetlands; prior converted cropland;	LOW	USDA Natural Resource Conservation Service (NRCS); private landowners

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
USDA also pays up to 75 percent of restoration costs. For both permanent and 30-year easements, USDA pays all costs associated with recording the easement in the local land records office, including recording fees, charges for abstracts, survey and appraisal fees, and title insurance. *Restoration Cost-Share Agreement*. This is an agreement (generally for a minimum of 10 years) to re-establish degraded or lost wetland habitat. USDA pays up to 75 percent of the cost of the restoration activity. This enrollment option does not place an easement on the property. Other agencies, conservation districts, and private conservation organizations may provide additional incentive payments as a way to reduce the landowner's share of the costs. Such special partnership efforts are encouraged.		farmed wetland pasture; farmland that has become a wetland as a result of flooding; range land, pasture, or production forest land where the hydrology has been significantly degraded and can be restored; riparian areas which link protected wetlands; lands adjacent to protected wetlands that contribute significantly to wetland functions and values; and previously restored wetlands that need long-term protection. *Ineligible Land*. Ineligible land includes wetlands converted after December 23, 1985; lands with timber stands established under a Conservation Reserve Program contract; Federal lands; and lands where conditions make restoration impossible. The Adjusted Gross Income provision of the 2002 Farm Bill impacts eligibility for WRP and several other 2002 Farm Bill		

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		programs. Individuals or entities that have an average adjusted gross income exceeding $2.5 million for the three tax years immediately preceding the year the contract is approved are not eligible to receive program benefits or payments. However, an exemption is provided for cases where 75 % of the adjusted gross income is derived from farming, ranching, or forestry operations. Compatible uses are allowed if they are fully consistent with the protection and enhancement of the wetland.		
Implement fish habitat improvement projects involving construction or placement of structures within the waterway, such as cross vanes, vortex weirs, large woody debris, fish screens, or side-channels. Fish habitat enhancement projects are defined as projects that accomplish one or more of the following tasks: (i) Elimination of human-made fish passage barriers, including culvert repair and replacement; (ii) Restoration of an eroded or unstable stream bank employing the principle of	Improves quality and quantity of aquatic habitat May reconnect hydrology of floodplain with side channels and off-channel habitats	Chapter 77.55 RCW requires that any person or agency proposing to conduct construction activities or perform any other work that will use, divert, obstruct, or change the flow or bed of waters of the state must obtain a Hydraulic Project Approval (HPA) from the Washington Department of Fish and	LOW to MEDIUM	Conservation Districts, landowners state and federal land management agencies, fish and wildlife agencies, Indian tribes

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
bioengineering, including limited use of rock as a stabilization only at the toe of the bank, and with primary emphasis on using native vegetation to control the erosive forces of flowing water; or (iii) Placement of woody debris or other instream structures that benefit naturally reproducing fish stocks (RCW 70.55.290). Chapter 77.55 RCW establishes a streamlined permitting process for fish habitat enhancement projects that exempts such projects from environmental review requirements of the State Environmental Policy Act (Chapter 43.21C RCW) and that precludes local governments from requiring permits or charging fees. If WDFW determines that a project meets the criteria for a fish habitat enhancement project, local governments are provided with a 15-day comment period within which to provide input to the Department of Fish & Wildlife (RCW 77.55.290). A special addition to the Joint Aquatic Permits Application (JARPA) form has been developed for use in the streamlined process for fish habitat enhancement projects.		Wildlife. Special provisions are contained in Chapter 77.55 RCW for approval of fish habitat enhancement projects. Approval of such projects can be accomplished though a number of means including, but not limited to: By WDFW under provisions of the Salmon Enhancement Program (Chapter 77.95 RCW) or the Volunteer Fish and Wildlife Enhancement Program (Chapter 77.100 RCW); by WDFW as a department-sponsored fish habitat enhancement of restoration project; by the sponsor of a Watershed Restoration Plan developed pursuant to Chapter 89.08 RCW; through the review and approval process for the Jobs for the Environment Program; through the review and approval process for conservation district-sponsored projects, where the project complies with		

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		design standards established by the state Conservation Commission through interagency agreement with the USFWS and NRCS (Chapter 77.55.290); or through a formal grant program established by the legislature or by the Department of Fish and Wildlife for fish habitat enhancement or restoration (RCW 77.55.290).		
Construct pool and riffle habitat using in-stream modifications. Where opportunities exist, work on public, federal, state, tribal and private lands can be conducted to increase the quantity of pools and gravel dominated riffles (as opposed to cobble). Pools can be constructed by direct intervention, often concurrently with work to restore channel form and function, and the quantity of gravel dominated riffles can be improved by decreasing channel slope, reducing entrenchment and confinement, and restoring pool/riffle sequencing.	Corrects past straightening or entrenchment activities, and improves complexity of aquatic habitat conditions Increases aquatic habitat Increases pools and riffle habitat.		LOW	Conservation Districts, state and federal land management agencies, fish and wildlife agencies, Indian tribes
Implement habitat improvement projects involving out-of-stream riparian restoration or enhancement, such as replanting or bank stabilization projects. Bioengineering methodologies can be incorporated into bank stabilization projects.	Reduces bank erosion and sediment loading Increases cover and shading of aquatic habitat	If project is implemented on private lands, cooperation with the landowner is crucial to the implementation and long-term success of the project.	LOW	Conservation Districts, state and federal land management agencies, fish and wildlife agencies, Indian tribes

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Projects can include planting of various native grass, shrub, and tree species, and may also involve bioengineering techniques, such as the use of willow bundles.	Improves recruitment of large woody debris			
Implement habitat improvement projects intended to "daylight" streams currently contained within enclosed channels. Some stream reaches have been placed in enclosed channels or piping systems. Such actions have been undertaken for various reasons, usually associated with land development activities. As a result of these types of actions, portions of the streams' aquatic and riparian habitats have been destroyed and, in some cases, fish migration has been impaired. 'Daylighting' describes projects that deliberately expose some or all of the flow of a previously covered river, creek, or stormwater drainage. Daylighting projects liberate waterways that were buried in culverts or pipes, covered by decks, or otherwise removed from view. Daylighting reestablishes a waterway in its old channel where feasible. Some daylighting projects re-create wetlands, ponds, or estuaries.	Restores aquatic and riparian habitat to reestablish natural function	If project is implemented on private lands, cooperation with the landowner is crucial to the success of the project	LOW to HIGH depending on the extent of the stream reach	Conservation Districts, state and federal land management agencies, fish and wildlife agencies, Indian tribes
Restore natural floodplain function in channelized stream reaches. Excavate a channel with natural alignment and geometry and revegetate riparian buffers.	Reestablishes stream and riparian habitat characteristics Reintroduces meander and flow	If project is implemented on private lands, cooperation with the landowner is crucial to the success of the project	MEDIUM to HIGH	Conservation Districts, state and federal land management agencies, fish and wildlife agencies, Indian tribes
Move river dikes back from existing river channels to allow for floodplain restoration and channel maintenance.	Reconnects the channel to the floodplain, side channels and/or off-channel habitats	If project is implemented on private lands, cooperation with the landowner is crucial to the	LOW to MEDIUM depending on extent of project	Conservation Districts, state and federal land management agencies,

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Diking can disconnect the channel from its floodplain, side-channels, and off-channel habitats may adversely affect fish habitat. Through removal of existing dikes and their relocation further landward, a river or stream can be allowed to reestablish more natural and proper floodplain function within the dikes.	Restores/Improves fish habitat within the dikes Reestablishes floodplain function within the dikes	success of the project. Benefits are limited to the area within the dikes, which may (or may not) encompass all of the original floodplain.		fish and wildlife agencies, Indian tribes
Plant native vegetation in riparian areas; plant native conifers and other large woody trees in the riparian area to establish shade, erosion control and provide future woody debris recruitment.	Enhances riparian function, including erosion control Establishes a source of natural woody debris for future recruitment Reestablishes native vegetation and riparian habitat		LOW	Conservation Districts, landowners, WDFW, Indian tribes
Fence riparian areas to keep cattle away from stream channel.	Reduces erosion of stream banks into streams Reduces pollutant loading into streams Protects riparian vegetation	Conservation districts can assist landowners with development of alternative water sources	LOW - MEDIUM	Conservation Districts, landowners, Indian tribes
Manage grazing in riparian areas following grazing plans designed to improve riparian condition; could include exclusion, partial season use, development of off-site water, herding, salting, rest-rotation, etc. Develop alternative water sources for livestock.	Reduces pressure on streams for water		LOW	Conservation Districts, federal land management agencies, landowners, Indian tribes
Remove or replace bridges, culverts, roadways, and other infrastructure as	Reduces sediment loading into streams from road runoff		LOW to MEDIUM	Local governments, transportation agencies,

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
necessary to eliminate or reduce their impacts as fish passage obstructions and/or channel constrictions.	Improves aquatic habitat Improves fish passage			federal land management areas, Indian tribes
Construct fish passage facilities where such facilities do not currently exist.	Improves successful fish passage Allows fish access to additional potential habitat		LOW to MEDIUM	State and federal land management agecies, WDFW, Indian tribes
Relocate campgrounds further from stream edges where assessments show potential for erosion and other adverse effects.	Reduces sediment loading into streams from recreation activities Protects riparian vegetation and habitat Reduces fecal input from campground waste facilities into streams	Availability of suitable campsites can restrict relocation opportunities. Frequent campground visitors may not support changes to location.	LOW to MEDIUM	State and federal recreation management agencies.
Implement an integrated noxious weed management program including survey, prevention practices, education, treatment and revegetation. Conduct weed control in riparian areas	Improves native vegetation communities		LOW to MEDIUM	Counties, state, federal transportation managers
Update Wildlife Area Management Plans to support riparian enhancement priorities.	Improves riparian function		LOW	Fish and wildlife management agencies, land management agencies.

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Implement BMP's to protect and enhance watersheds with ESA listed steelhead and chinook.	Improves habitat conditions for ESA listed fish species Cost-share can be utilized from federal and state agencies as a match to BPA Funds to implement riparian buffers		LOW	Conservation District
Acquire conservation easements to protect and restore fish bearing streams and/or spring fed tributaries.	Improves aquatic habitat for area protected by easement	Both federal, state, local, and tribal government as well as private organization can acquire lands through purchase, donation, or other means for protection of fish and wildlife habitat. This includes lands along rivers, lakes, or estuaries or lands containing valuable wetland complexes. Conservation easements can be a less expensive option to outright purchase. Under conservation easements, property owners retain rights to use portions of their property, but set aside critical habitat areas, such as shoreline areas or buffers, for non-use and retention of their natural state. Unless conducted on a broad stream or watershed scale, protection may be piecemeal	MEDIUM	Conservation districts, fish and wildlife agencies, Indian tribes, private entities

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		and ineffective.		
Amend or modify Growth Management Act comprehensive plans or other local land use plans, and/or critical areas ordinances to protect habitat and control floodplain development.	Protects existing habitat Protects existing floodplain capacity to provide flood control	Provides protection against some types of future development, but does not address past activities or existing development.	LOW to MEDIUM	Local governments
Continue Operation and Maintenance (O&M) activities associated with past habitat improvement projects. Includes maintenance of stream improvement and water control structures.	Provides information to assist future habitat improvement projects and revise adaptive management of past projects		LOW to MEDIUM	Initiating party of original project; conservation districts, land management agencies; fish and wildlife agencies
Replace open ditch conveyance systems for irrigation with lined ditches or piping.	Reducing the quantity of irrigation water lost in conveyance can result in more water left in streams and rivers, improving adult and juvenile passage for ESA-listed species, lowering water temperatures, and increasing instream flow	The purpose of the project must be clearly defined, as Increasing the efficiency of the conveyance system could be used to make additional water available for irrigation rather than instream flow.	LOW to MEDIUM	Irrigation districts, fish and wildlife agencies
Improve irrigation diversions to enhance fish passage and provide more effective fish screening	Improves adult and juvenile passage and reduces juvenile irrigation entrainment mortality for ESA listed species		LOW to MEDIUM	Irrigation districts, fish and wildlife agencies
Install a screened lift pump system at irrigation diversions. Replace gravel push up dams with a lift pump system which incorporates a compliant fish screen.	Improves adult and juvenile passage and reduces juvenile irrigation entrainment mortality for ESA listed species		LOW	Irrigation districts, fish and wildlife agencies

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Plant native grasses and shrubs along rural roads.	Reduces erosion from cutbanks Increases stream shade within riparian areas		LOW	Federal and state land management agencies, counties
Plant native grasses and shrubs within timber sale boundaries and roads.	Reduces erosion Increases stream shade within riparian areas		LOW	Federal land management agencies
Develop a Habitat Conservation Plan (HCP) prepared under provisions of Section 10 (16 U.S.C. 1539) of the Endangered Species Act. Nonfederal entities such as private landowners or state and local governments can prepare Habitat Conservation Plans to address an otherwise lawful project or land or water use activity (for example, agriculture or forestry) that might result in the unintentional take of a listed species. A plan must describe the anticipated impact of a proposed taking on the affected species, how the take will be minimized and mitigated, and how mitigation measures will be funded.	Provides an Incidental Take Permit for landowners (e.g. protection against liability for "taking" listed species within the activities approved in the plan) Provides assurances that mitigation measures to protect/enhance the listed species will be conducted over a specified period of time Reduces uncertainty in impacts to endangered species	A Habitat Conservation Plan must gain approval of the Fish and Wildlife Service or NOAA Fisheries, as applicable. Based on the approved Habitat Conservation Plan, the private landowner or government is authorized to incidentally take listed species through any activity that is undertaken in a manner consistent with the plan. This authorization is authorized through an Incidental Take Permit. A Habitat Conservation Plan applicant can also negotiate for long term regulatory assurances that no additional mitigation measures will be required over the life of the project or activity, provided the plan is properly	MEDIUM	State government, local government, landowners, conservation districts, irrigation districts.

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		implemented.		
Develop a Habitat Incentives Program under Chapter 77.55 RCW. The program allows a private landowner to enter into an agreement with either or both the Washington Department of Fish and Wildlife and Washington State Department of Natural Resources to enhance fish or wildlife habitat on private land in exchange for regulatory certainty with regard to future applications for an HPA or Forest Practices Permits on the property covered by the agreement.	Provides increased operational certainty for landowners Improves habitat conditions for fish and wildlife	A single agreement can encompass up to 1,000 acres. A private landowner can enter into multiple agreements provided the total acreage covered under the agreements does not exceed 10,000 acres (RCW 77.55.280).	LOW to MEDIUM	State fish and wildlife agency, state department of natural resources
Develop local government regulations or programs to control sources of sediment that are not addressed through critical areas ordinances or other existing regulations and programs. This alternative may involve amending existing critical areas ordinances or grading and filling ordinances, creation of new ordinances, or development of educational programs to provide control over erosion and sedimentation sources that are not currently addressed.	Increases control over erosion and sediment sources Increases conservation of critical areas		LOW	Local governments
Integrate habitat improvement planning into flood hazard reduction plans. Concepts such as restoration of floodplain function, preservation or reestablishment of natural riparian habitat, and preservation of riparian wetland functions could be integrated into flood hazard reduction planning to improve riparian and aquatic habitat within the floodplain.	Restores floodplain function Improves riparian habitat		LOW	Local governments
Support implementation of the	Provides compliance with the	Most of the findings of the	LOW to MEDIUM	State and federal forest

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
recommendations of Washington's Forest and Fish Report. Provide assistance in gaining public and landowner support for implementation of the Forest and Fish Report recommendations through outreach activities and other appropriate measures. The Report is a compilation of biologically sound and economically practical solutions that will improve and protect riparian habitat on non-federal forest lands in the State of Washington. Among the provisions of the Forest Practices Act (Chapter 76.09 RCW) are requirements for improved road culverts to facilitate fish passage, enhanced road construction practices to reduce erosion and sedimentation, and enlarged stream buffers to provide better shading (Washington Forest Protection Association 2002).	Endangered Species Act for aquatic and riparian-dependent species on non-federal forest lands Restores and maintains riparian habitat on non-federal forest lands Meets the requirements of the Clean Water Act for water quality on non-federal forest lands	Forest and Fish Report have been codified as part of the state's Forest Practices Act (Chapter 76.09 RCW), administered by the Department of Natural Resources. Recognizing that implementation of the Forests and Fish Law provisions may be burdensome to small family-owned forest operations, the legislature authorized establishment of a Small Forest Landowner Office within DNR. This was accomplished through amendment of a code related to the Forest Practices Act (Chapter 76.13 RCW, Stewardship of Non- industrial Forests and Woodlands). The Small Forest Landowners Office provides technical assistance to small forestland holders in developing management and harvest plans. The office also promotes, implements, and manages the *Forestry Riparian Easement*	depending on extent of required and/or voluntary practices	management agencies, Forestry Industry, landowners, Indian tribes, Planning Unit

Table B-7 HABITAT ENHANCEMENT TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
		Program (Chapter 76.13.120). The Forestry Riparian Easement Program partially compensates eligible small forest landowners in exchange for a 50- year easement for timber left unharvested near a river, lake, or wetland.		
Re-establish historic wet meadow complexes where feasible.	Restores or enhances wetlands Improves fish and wildlife habitat		LOW to MEDIUM depending on the extent of the project	Conservation districts, NRCS, private landowners

Table B-8				
MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Surface and Groundwater Quality Monitoring				
Conduct water quality monitoring programs, including installation and maintenance of monitoring devices, to measure the extent of non-point source pollution and/or measure the effectiveness of non-point source pollution control measures.	Understand water quality condition of critical water bodies Assist land and water managers with setting management protocols and goals Measures progress of watershed restoration activities	N/A	LOW staff salary and equipment to conduct monitoring	Federal, State, Local Governments, Conservation Districts, Water Purveyors, Watershed Councils
Evaluate TMDL implementation. Once a TMDL has been completed and has begun being implemented, a regular evaluation can be made to determine if voluntary measure to implement controls on non-point sources of pollution are being done, as stated. Also, the study would monitor if the measures were effective in reducing load on the water body.	Assists land and water managers with setting management protocols and goals Measures progress of watershed restoration activities	Implementation activities recommended under TMDLs are voluntary for control of non-point source pollution. There may be constraints to implementation due to cost and/or impacts to landowners.	LOW	State and Local governments, Conservation Districts, Watershed Councils

Table B-8 MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Monitor impacts to groundwater supplies Groundwater monitoring would be based on a multi-faceted approach. 1. Evaluate availability and usefulness of existing groundwater quality monitoring data. Include a review of whether new monitoring programs need to be established and integrate any data collected from Ecology-regulated sites and facilities. 2. Establish short-term monitoring approach to determine baseline conditions. Implement a one-time monitoring event with a large number of monitoring locations including household wells and verify well-completion details at monitoring locations. 3. Establish long-term monitoring approach to detect impacted groundwater supplies. Develop periodic monitoring events at a reduced number of locations used in the baseline assessment (2); and target "at-risk" sites from the assessment in (1). 4. Establish a long-term monitoring approach to evaluate performance of implemented management strategies. All implemented management strategies should include long-term monitoring to conduct performance evaluations.	Understand water quality condition of ground water resources Assist land and water managers with setting management protocols and goals Measures progress of watershed restoration activities	Utilize technical expertise from Ecology, DOH, and USGS.	MEDIUM	Federal, State, Local Governments, Conservation Districts, Water Purveyors, Watershed Councils
Monitor impacts to groundwater supplies Groundwater monitoring would be based on a multi-faceted approach. 1. Evaluate availability and usefulness of existing groundwater quality monitoring data. Include a review of whether new monitoring programs need to be established and integrate any data collected	Understand water quality condition of ground water resources Assist land and water managers with setting management protocols and goals	Utilize technical expertise from Ecology, DOH, and USGS.	MEDIUM	Federal, State, Local Governments, Conservation Districts, Water Purveyors, Watershed Councils

Table B-8 MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
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Water Quantity Monitoring				
Analyze baseline water conditions in the watershed. Included in the baseline would be a water budget for applicable water bodies, which would include an inventory of all water sources, such as springs, wells, and surface flows. Also included would be all pertinent information regarding surface water, groundwater and biological communities. Other information would include water used for temporary (drought) emergencies, exempt wells, tribal trust purposes, wildlife refuges, storage projects, supplementation and substitution.	Assists land and water managers with setting management protocols and goals	This information would be most useful if stored, maintained and updated by one entity to ensure quality control of the data.	MEDIUM	Federal, State, Local Governments, Conservation Districts, Water Purveyors, Watershed Councils
Monitor current water permitting system	Assist in understanding of impacts	Agencies such as U.S. Fish and	LOW	State governments

Table B-8 MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
for the watershed. Once priorities for instream flow and water use have been established in the watershed, an evaluation can be made to determine if permitting actions are meeting established targets.	of individual permits and at programmatic level on instream flows, tribal rights and fishery habitat	Wildlife Service, NOAA Fisheries, and affected Indian tribes will likely request consultation on new applications for permit, which may impact surface flows and focal fish species.		
Monitor stored water levels. Monitor storage right to store water in those months that water is available based on an exceedence analysis.	Assists in providing consistency of flows for focal fish species	Requires coordination and cooperation from water storage principals.	LOW	Federal and state governments, conservation districts
Monitor groundwater use. Use U.S. Geologic Survey regional numerical flow model to develop a plan to monitor well drawdowns and surface water interference and for recovery of groundwater resources, if applicable. Monitor any new permits that would exceed limits reached, and whether recovery goals have been met. Prior to implementation of this monitoring tool, as assessment of groundwater resources and connectivity between surface and groundwater would be made to understand overall contribution of groundwater to surface flows. The assessment would also include an evaluation of aquifer capacity, depletion rates, and recharge.	Assist in understanding of impacts to surface water from well drawdowns	In Washington state, a hydraulic connection between ground water and surface water is presumed as a matter of course. Thus when the state closes surface waters in a watershed to further appropriation, it closes the groundwater at the same time.	LOW	Federal, state, local governments, conservation districts.
Monitor water meters. Meters measure the rate and duty of water at the point of diversion. An evaluation of meters would be valuable in providing information for a baseline inventory of water uses, losses and the efficacy of watershed	Assists in the development of water use inventory and water budget Assists water managers with		LOW	State governments (watermaster), landowners

Table B-8				
MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
projects designed to recover flows.	setting management protocols and goals			
Monitor existing water rights. An ongoing monitoring program of all water rights (including municipal) and inchoate (allocated but not yet put to use) water rights would assess whether rights are not in use, real v. paper water, availability of surface flows for instream/beneficial purposes, determine season of use trends, and potential eligibility of water available for instream flow dedication as trust water.	Assists in the development of water use inventory and water budget Assists water managers with setting management protocols and goals	The evaluation of water rights may be of concern to local water rights holders.	LOW	State governments (watermaster), landowners
Analyze outstanding water rights applications on file with state water agency. An analysis of outstanding water right applications on file with state water agencies can assess whether the applicants are still interested in pursuing their projects. There are applications submitted over time but not finalized or used and thus may not accurately reflect the current demand for water. The analysis can be organized by geographic area, proposed types and seasons of use, quantities requested, quantities likely to be awarded, etc.	Assists in the development of water use inventory and water budget Assists water managers with setting management protocols and goals based on actual demand	Landowners may not be willing to withdraw outstanding applications.	LOW	State governments (watermaster)
Water Conservation Monitoring				
Monitor conservation programs implemented by municipal, industrial, commercial and other water users to determine water savings. Determine efficacy of program(s) in terms of water saved, costs, and viability for long-term success.	Assists water managers with setting management protocols and making changes if necessary to meet water savings goals		LOW	Implementing party of conservation program

Table B-8 MONITORING TOOLS				
Description of Tool	**Potential Benefits**	**Potential Issues (Legal, Technical, Social, Institutional)**	**Comparative Cost**	**Party Responsible for Implementation**
Monitor irrigation efficiency projects. Irrigation efficiency projects are designed to save water by changing and/or modifying equipment, scheduling, crop management, etc. An evaluation of efficiency would provide information on the effectiveness of new equipment or management regimes to meet conservation goals.	Assists landowners and water managers with setting management protocols and goals Provides credit to landowners and conservation districts for meeting instream flow goals	In October 2005, DOE approved the program guidance for Determining Irrigation Efficiency and Consumptive Use. According to the state DOE "staff will follow the guidance when issuing new water rights for irrigation purposes, when conducting tentative determinations of existing irrigation water rights, when evaluating trust water right applications, and in other situations when determining irrigation efficiency and the consumptive use associated with irrigation is necessary.	LOW	Landowners, conservation districts
Evaluate impacts of drought emergency relief efforts that provide access to temporary water for water right holders. Evaluation would include data on how much water was used, program costs, compliance with metering, cost-benefit to the state on the program.	Assists water managers in planning for drought and other emergencies Assists water managers with setting management protocols and goals		LOW	State government
Monitor utility rates for pumping costs. Pumping costs are indirectly related to the amount of water versus conservation of water used by individual permits.	Assists water managers in setting rates appropriate to conserve water for meeting consumer demand and reduce impacts to watershed	Consumer laws may require that utility rates be sufficiently high to avoid subsidies provided by non-irrigator customers.	LOW	Utility Companies, Public Utility Commission